



Cyprus
University of
Technology

School of Health Sciences

Doctoral Thesis

Prevalence of breastfeeding up to the sixth month of the infant's life and its association with breastfeeding self-efficacy and the perceived experience of the implementation of the Baby-Friendly Hospital Initiative's 10 Steps for Successful Breastfeeding

Mary Economou

Limassol, July 2018



Διδακτορική διατριβή

*Επιπολασμός του μητρικού θηλασμού μέχρι τον έκτο μήνα της
ζωής του παιδιού και συσχέτιση με την αντιλαμβανόμενη
αυτοπεποίθηση για μητρικό θηλασμό και την αυτοαναφερόμενη
εφαρμογή των '10 βημάτων για επιτυχή θηλασμό' στα
μαιευτήρια της Κύπρου*

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CYPRUS UNIVERSITY OF TECHNOLOGY

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ABSTRACT

Background: Breastmilk is the ideal source of infant nourishment. However, exclusive breastfeeding (EBF) for the first six months, as recommended by the WHO, remains relatively low even after three decades of international and national initiatives for the promotion of breastfeeding. While the effectiveness of the Baby-Friendly Hospital (BFH) Initiative's "Ten Steps for Successful Breastfeeding" has been documented, there is often suboptimal implementation. No hospital in Cyprus has BFH certification and there is only anecdotal evidence with regards to the implementation of the 10 steps and the International Code for the Marketing of Breastmilk Substitutes (ICMBS). Furthermore, the only data for breastfeeding is restricted to the first 48 hours. Low maternal breastfeeding self-efficacy (BFSE), which is influenced by maternity care practices, contributes to the premature discontinuation of breastfeeding.

Objectives: To provide first-time estimates of the prevalence of BF and EBF up to the sixth month in Cyprus and examine the socio-demographic and other determinants of breastfeeding initiation, continuation and exclusivity, including BFSE and implementation of the BFHI's "10 steps for successful breastfeeding"

Methods: A cross-sectional and longitudinal descriptive study with a nationwide consecutive sample of 586 mother-infant dyads. Participating mothers were recruited over a period of 6-8 weeks from all the public maternity wards and 24 of 30 private clinics within 48 hours after birth. Mothers were followed up with phone interviews at the first, fourth and sixth month after birth. At baseline, mothers self-reported their experience of the "10 steps for successful breastfeeding" with the use of the 24-item WHO/ UNICEF Baby Friendly Hospital Initiative (BFHI) questionnaire. They also responded to the 14-item BSES-SF to assess their perceived maternal breastfeeding self-efficacy. At the first month follow-up, information on infant feeding practices was recorded on the basis of the self-reported current status and the 24hr recall method. Additionally, mothers also completed the BSES-SF. In subsequent follow-ups, infant feeding practices were recorded as described above as well as with a retrospective event calendar. At the fourth month, mothers responded to the Perceived Infant Care Social Support (PICSS) scale and at the sixth month to the Workplace Breastfeeding Social Support (WBSS) scale. Prevalence of breastfeeding (BF) and exclusive breastfeeding (EBF) was estimated at

each time-point. Odds ratios of BF and EBF while at the clinic and at the 1st, 4th and 6th month according to mothers' experience of the 10 steps, levels of breastfeeding self-efficacy and other determinants were estimated in a series of univariable and multivariable logistic regression models.

Results: While initiation of breastfeeding was relatively high (84.0% private and 84.5% public sector), the prevalence of exclusive breastfeeding at 48 hours did not exceed 23.6% in the public and 16.0% in the private sector. One in two women in public hospitals had a vaginal delivery, while in the private sector the rate of vaginal birth did not exceed 36.9%. A gradual reduction in EBF was observed, even though by the sixth month only 5% (95% CI: 3.1%-7.5%) of the mothers were still breastfeeding exclusively. In contrast, premature discontinuation of BF was recorded with the highest reduction observed after the first and before the fourth month. By the 6th month, 32.4% (95% CI: 27.7%-37.2%) of the participants were breastfeeding. For primiparas and those who gave birth by C/S, even lower rates of initiation, exclusivity and duration of breastfeeding were recorded. There was evidence of a social gradient and mothers of higher social position in terms of income or education were more likely to breastfeeding, to breastfeed exclusively and to breastfeed longer. Breastfeeding self-efficacy was only moderate, and lower among primiparas, those who delivered by caesarian section and those who did not experience the WHO's "10 steps". While higher levels of self-efficacy were not associated with the likelihood of breastfeeding initiation, there was a clear stepwise association between self-efficacy and exclusivity. The quartile of mothers with the highest levels of self-efficacy at 48 hours were five time more likely to breastfeed exclusively (40.5% vs 7.9% among those with the lowest levels). The association between in-hospital breastfeeding self-efficacy and EBF persisted at the 1st (OR= 5.0 95% CI 1.5-16.6), 4th (OR=8.5 95% CI 1.7-43.5) and 6th (OR=5.7 95% CI 0.6-56.5) month, even after adjusting for socio-demographic characteristics including mode of delivery, parity and social position. Similar, if not even stronger associations were observed between self-efficacy as reported at the 1st month and the prevalence of BF/EBF at subsequent time-points. There appears to be relatively good adherence to the ICMBS across Cypriot maternity units. A higher degree of implementation was also observed in terms of assistance in breastfeeding skills development (step 5) along with advice for breastfeeding on demand (step 8). However, only 26.1% of mothers experienced skin-to-skin contact (step 4), while rooming-in (step 7) was more likely to be practiced in the public sector (28.5%) compared to the private

sector (19.7%). Predictors of BF in stepwise models were holding the baby within one hour, practical assistance, implementation of the marketing code, no use of pacifiers and guidance for community support. For EBF, the strongest predictors were holding the baby within one hour, no use of pacifiers as well as skin-to-skin, rooming-in and receiving prenatal information. Mothers who practiced skin-to-skin and did not use pacifiers were 3-4 times more likely to EBF in the long term. Associations with skin-to-skin did not attenuate after adjustment for mode of birth, parity, education, income and employment status. Overall social support in infant care was moderate ($M=3.10$, $SD=0.53$) on a four-point scale, with lower levels of instrumental support ($M=2.81$, $SD=0.57$). A social gradient was apparent in favor of mothers of higher socioeconomic position, even though differences were statistically significant only with regards to instrumental and emotional support. The partner was the main source of instrumental, emotional and appraisal support (70-85%), followed by maternal grandmothers (60-70%) with less than a third naming any other person. In terms of informational support, pediatricians ranked first (73%) closely followed by grandmothers (69%), with less than a quarter listing the partner, other health professionals, other family members or friends. While peer and environmental support in the workplace were moderate, workplaces were not rated as breastfeeding friendly in terms of facilities ($M=2.74$, $SD=0.99$) and technical support ($M=2.92$, $SD=1.62$) on a 7-point scale.

Conclusion: Exclusive breastfeeding in Cyprus appears particularly low even while at the clinic, which needs further investigation. Together with the fact that caesarean rates rank Cyprus amongst the highest positions in Europe, this indicates the pressing need for breastfeeding promotion interventions. Low self-efficacy in the early period is predictive of non-exclusivity and earlier discontinuation of breastfeeding, suggesting that the BFSE can be successfully used in clinical and community practice as an assessment tool. Based on mothers' assessment, there appears to be a significant gap in the implementation of the "10 Steps" across maternity clinics. The association of BF and EBF with some of the least practiced steps across Cypriot clinics highlights the need for the further strengthening of the National Strategy (2011) and Policy (2015) to include policy measures, educational and community support interventions at the pre- and post-natal period to promote, protect and support breastfeeding.

Keywords: Breastfeeding, Exclusive Breastfeeding, Maternal Breastfeeding Self-Efficacy, 10 Steps to Successful Breastfeeding, Infant Care Social Support, Workplace Breastfeeding Social Support.

ΠΕΡΙΛΗΨΗ

Εισαγωγή: Το μητρικό γάλα αποτελεί ιδανική τροφή για το νεογνό. Εντούτοις, ακόμη και μετά από τρεις δεκαετίες διεθνών και εθνικών πρωτοβουλιών για την προστασία, προαγωγή και στήριξη του θηλασμού, ο αποκλειστικός μητρικός θηλασμός (ΑΜΘ) για τους πρώτους έξι μήνες της ζωής του παιδιού, όπως συνίσταται από την ΠΟΥ, παραμένει σε χαμηλά επίπεδα. Ενώ πολλά ερευνητικά δεδομένα υποστηρίζουν την αποτελεσματικότητα των «Δέκα βημάτων για επιτυχή θηλασμό», τον ακρογωνιαίο λίθο της Πρωτοβουλίας για τα «Φιλικά προς το Βρέφος Νοσοκομεία» (Baby-Friendly Hospital)", εκφράζεται ανησυχία αναφορικά με το βαθμό συμμόρφωσης των μαιευτηρίων. Κανένα νοσοκομείο στην Κύπρο δεν έχει λάβει πιστοποίηση ως BFH και δεν υπάρχουν δεδομένα ως προς το βαθμό εφαρμογής των βημάτων και του Διεθνή Κώδικα για την Εμπορία Υποκατάστατων Μητρικού Γάλακτος (ICMBS). Επιπλέον, τα μόνα δεδομένα για το θηλασμό στην Κύπρο περιορίζονται στις πρώτες 48 ώρες. Η χαμηλή αυτοπεποίθηση για μητρικό θηλασμό, η οποία επηρεάζεται από τις πρακτικές των μαιευτηρίων, συμβάλλει στην πρόωρη διακοπή του θηλασμού.

Σκοπός: Σκοπός της μελέτης είναι η εκτίμηση για πρώτη φορά στη Κύπρο του επιπολασμού του ΜΘ και του ΑΜΘ μέχρι τον έκτο μήνα της ζωής του παιδιού και η διερεύνηση των κοινωνικοδημογραφικών και άλλων προσδιοριστικών παραγόντων της έναρξης, της συνέχισης και της αποκλειστικότητας του θηλασμού, συμπεριλαμβανομένων της αντιλαμβανόμενης αυτοπεποίθησης για θηλασμό και της εφαρμογής των «10 Βημάτων» με βάση την αναφορά των ίδιων των μητέρων.

Μεθοδολογία: Πρόκειται για περιγραφική μελέτη με δυο φάσεις – στην πρώτη φάση διεξήχθη περιγραφική μελέτη σύγκρισης και συσχέτισης κατά τις πρώτες 48 ώρες μετά τον τοκετό και, στη δεύτερη φάση, διαχρονική μελέτη με τηλεφωνική παρακολούθηση κατά τον πρώτο, τέταρτο και έκτο μήνα της ζωής του παιδιού. Στη μελέτη συμμετείχε εθνικά αντιπροσωπευτικό διαδοχικό δείγμα 586 γυναικών, οι οποίες γέννησαν κατά την περίοδο στρατολόγησης, η οποία διήρκεσε 6-8 εβδομάδες ανά κλινική, σε όλα τα μαιευτήρια του δημόσιου τομέα ή σε κάποια από τις 24 (στις 30) μαιευτικές κλινικές του ιδιωτικού τομέα. Κατά την παραμονή τους στη μαιευτική κλινική, οι συμμετέχουσες αυτοαξιολόγησαν την εμπειρία τους από τα «10 βήματα για επιτυχή θηλασμό» στη βάση του επίσημου ερωτηματολογίου αξιολόγησης και παρακολούθησης των «Νοσοκομείων, Φιλικών προς τα βρέφη» του WHO και της UNICEF, το οποίο περιλαμβάνει 24

ερωτήσεις πολλαπλής επιλογής. Συμπλήρωσαν, επίσης, την κλίμακας BSES-SF (breastfeeding self-efficacy scale – short form) στη σύντομη της έκδοση των 14 ερωτήσεων για την αξιολόγηση του αντιλαμβανόμενου βαθμού αυτοπεποίθησης (αυτεπάρκειας) για μητρικό θηλασμό. Κατά το πρώτο μήνα, λήφθηκαν με τηλεφωνική συνέντευξη πληροφορίες σχετικά με τις πρακτικές σίτισης των νεογνών, σύμφωνα με τη μέθοδο της αυτο-αναφοράς όσο και τη μέθοδο ανάκλησης 24ώρου. Οι θηλάζουσες μητέρες συμπλήρωσαν ξανά το εργαλείο της αντιλαμβανόμενης για το μητρικό θηλασμό (BSES-SF). Σε επακόλουθη επικοινωνία με τις συμμετέχουσες, καταγράφηκαν οι πρακτικές σίτισης των νεογνών τόσο με τις προαναφερθείσες μεθόδους, όπως επίσης με την μέθοδο ανάκλησης γεγονότων. Κατά τον τέταρτο και τον έκτο μήνα, οι συμμετέχουσες συμπλήρωσαν την κλίμακα της «Αντιλαμβανόμενης Κοινωνικής Στήριξης στη Φροντίδα του Βρέφους» (PICSS) και την κλίμακα «Στήριξη για Θηλασμό στο χώρο Εργασίας» (WBSS) αντίστοιχα. Για τη κάθε χρονική στιγμή υπό μελέτη, εκτιμήθηκε ο επιπολασμός του θηλασμού (BF) και του αποκλειστικού θηλασμού (EBF). Η σχετική πιθανότητα μια μητέρα να θηλάζει και να θηλάζει αποκλειστικά στις 48 ώρες και στον 1^ο, 4^ο και 6^ο μήνα αναφορικά με την αυτοαναφερόμενη εμπειρία των «10 βημάτων» στάδια, τη μητρική αυτοπεποίθηση για θηλασμό και άλλους προσδιοριστικούς παραγόντων εκφράστηκε ως λόγος των οτς (odds ratio) με τη χρήση σειράς απλών και πολλαπλών μοντέλων λογιστικής παλινδρόμησης.

Αποτελέσματα: Ενώ τα επίπεδα έναρξης του ΜΘ κατά τις πρώτες 48 ώρες ήταν σχετικά υψηλά (84,0% και 84,5% στα μαιευτήρια του ιδιωτικού και δημόσιου τομέα αντίστοιχα), το ποσοστό των μητέρων που θήλασαν αποκλειστικά ενώσω στο μαιευτήριο δεν ξεπερνούσε το 23,6% στο δημόσιο και το 16% στον ιδιωτικό τομέα. Μία στις δύο γυναίκες στα δημόσια νοσοκομεία γέννησαν με φυσιολογικό τοκετό, ενώ στον ιδιωτικό τομέα το ποσοστό φυσιολογικού τοκετού δεν ξεπέρασε το 36,9%. Ως προς τον ΑΜΦ, παρατηρήθηκε μια σχετικά ομαλή μείωση σε βάθος χρόνου, αν και κατά τον 6^ο μήνα, μόνο 5% (95% ΔΕ 3,1%-7.6%) των μητέρων θήλαζαν αποκλειστικά. Αντίθετα, ως προς τον ΜΘ, παρατηρήθηκε πρόωρη διακοπή με την μεγαλύτερη μείωση να καταγράφεται μετά τον πρώτο και πριν τον τέταρτο μήνα. Κατά τον έκτο μήνα, το ποσοστό των μητέρων που θήλαζαν ήταν 32,4% (95% ΔΕ 27.7%-37.2%). Για όσες γυναίκες ήταν το πρώτο τους παιδί, αλλά και για όσες γέννησαν με καισαρική τομή, τόσο τα ποσοστά έναρξης, αποκλειστικότητας αλλά και συνέχισης του θηλασμού ήταν ακόμα χαμηλότερα. Παράλληλα, διαφάνηκε μια κοινωνική διαβάθμιση όπου μητέρες σε πιο πλεονεκτική

κοινωνική θέση (ως προς το εισόδημα ή το επίπεδο εκπαίδευσης) ήταν πιο πιθανό να θηλάσουν, να θηλάσουν αποκλειστικά και να θηλάσουν για μεγαλύτερη διάρκεια. Η αντιλαμβανόμενη αυτοπεποίθηση για ΜΘ ήταν σε μέτρια επίπεδα, με χαμηλότερα επίπεδα να καταγράφονται σε όσες γυναίκες ήταν το πρώτο τους παιδί, στις γυναίκες που γέννησαν με καισαρική τομή και σε όσες δεν ανέφεραν «καλές πρακτικές» κατά την παραμονή τους στο μαιευτήριο σύμφωνα με τα '10 Βήματα'. Ενώ τα υψηλότερα επίπεδα αυτοπεποίθησης δεν σχετίστηκαν με την πιθανότητα έναρξης του θηλασμού, παρατηρήθηκε μια σαφής διαβάθμιση στη σχέση μεταξύ της αυτοπεποίθησης και της πιθανότητας ο θηλασμός να είναι αποκλειστικός. Με βάση τα τεταρτημόρια της κατανομής της αυτοπεποίθησης για ΜΘ στις 48 ώρες, οι γυναίκες με τα υψηλότερα επίπεδα ήταν πέντε φορές πιο πιθανό να θηλάσουν αποκλειστικά συγκριτικά με τις γυναίκες με τα χαμηλότερα επίπεδα (40,5% έναντι 7,9%). Η αυτοπεποίθηση για ΜΘ κατά τις 48 ώρες μετά τον τοκετό σχετίστηκε με την πιθανότητα συνέχισης του αποκλειστικού θηλασμού σε βάθος χρόνου, και συγκεκριμένα κατά τον πρώτο μήνα (OR= 5,0 95% CI 1,5-16,6), τον τέταρτο μήνα (OR=8,5 95% CI 1,7-43,5) και τον έκτο μήνα (OR=5,7 95% CI 0,6-56,5), ακόμη και μετά την προσαρμογή για άλλους προσδιοριστικούς παράγοντες, όπως τύπο τοκετού, αριθμό παιδιών και κοινωνική θέση. Παρόμοιες, αν όχι ακόμη ισχυρότερες, συσχετίσεις παρατηρήθηκαν μεταξύ της αυτοπεποίθησης για ΜΘ όπως καταγράφηκε κατά τον πρώτο μήνα και της συνέχισης του ΜΘ και του ΑΜΘ σε βάθος χρόνου. Με βάση την αναφορά των συμμετεχουσών, παρατηρήθηκε σχετικά καλή εφαρμογή του Διεθνούς Κώδικα Υποκατάστατων Μητρικού Θηλασμού στις μαιευτικές κλινικές στην Κύπρο. Ως προς τα 10 βήματα, πιο συστηματική εφαρμογή φάνηκε να τυγχάνουν η παροχή πρακτικής βοήθειας για ΜΘ από το προσωπικό (Βήμα 5), όπως επίσης η παροχή σχετικών συμβουλών για διαχείριση του θηλασμού με βάση τη ζήτηση (Βήμα 8). Ωστόσο, μόνο το 26,1% των μητέρων δήλωσε ότι είχε δερματική επαφή με το νεογνό μετά τον τοκετό (βήμα 4), ενώ η πρακτική της συγκατοίκησης μητέρας-νεογνού (βήμα 7) φαίνεται να εφαρμόζεται κάπως πιο συχνά στον δημόσιο τομέα (28,5%) σε σύγκριση με τον ιδιωτικό τομέα (19,7%). Προβλεπτικοί παράγοντες για ΜΘ κατά την παραμονή στο μαιευτήριο, όπως διαφάνηκαν σε βηματικά πολυμεταβλητά μοντέλα παλινδρόμησης, ήταν: η επαφή της μητέρας με το νεογνό εντός μίας ώρας, η παροχή πρακτικής βοήθειας, η εφαρμογή του κώδικα ICMBS, η μη χρήση πιπίλας ή τεχνητών θηλών και η πληροφόρηση αναφορικά με πηγές στήριξης για ΜΘ μετά το εξιτήριο. Για τον ΑΜΘ, ισχυρότεροι προβλεπτικοί παράγοντες ήταν η επαφή με το νεογνό εντός μιας ώρας, η μη χρήση πιπίλας, καθώς επίσης και η δερματική επαφή (skin-to-skin), η

συγκατοίκηση μητέρας-νεογνού (rooming-in) και η ενημέρωση για τα οφέλη και τη διαχείριση του ΜΘ κατά την προγεννητική περίοδο. Μάλιστα, φάνηκε ότι οι μητέρες που εφάρμοσαν την πρακτική της επαφής δέρμα-με-δέρμα με το νεογνό και δεν χρησιμοποιούσαν πιπίλες ήταν 3-4 φορές πιθανότερο να θηλάσουν αποκλειστικά σε βάθος χρόνου. Η συσχέτιση της πρακτικής της δερματικής επαφής με τον ΑΜΘ σε βάθος χρόνου παρέμεινε ισχυρή ακόμα και μετά από την προσαρμογή για τον τύπο τοκετού, τον αριθμό των παιδιών, την εκπαίδευση, το εισόδημα και την εργασιακή κατάσταση της μητέρας. Η αντιλαμβανόμενη κοινωνική στήριξη στη φροντίδα του νεογνού ήταν σε σχετικά μέτρια επίπεδα ($M=3.10$, $TA=0.53$) σε κλίμακα τύπου Likert τεσσάρων σημείων, με χαμηλότερα επίπεδα να παρατηρούνται στη διάσταση της απτής στήριξης ($M=2.81$, $TA=0.57$). Για όλες τις διαστάσεις της στήριξης ήταν εμφανής η κοινωνική διαβάθμιση, αφού παρατηρήθηκε θετική συσχέτιση της με δείκτες κοινωνικής θέσης, παρόλο που οι παρατηρούμενες διαφορές ήταν στατιστικά σημαντικές μόνο στην περίπτωση της απτής και της συναισθηματικής στήριξης. Ένα μεγαλύτερο ποσοστό των γυναικών ονόμασε τον σύντροφο ως την κύρια πηγή στήριξης ως προς τις διαστάσεις της απτής στήριξης, της συναισθηματικής στήριξης και της στήριξης ως έκφραση εκτίμησης (70-85%). Στη δεύτερη θέση είναι οι γιαγιάδες από την πλευρά της μητέρας (60-70%), ενώ λιγότερες από μια στις τρεις γυναίκες ονόμασε οποιοδήποτε άλλο άτομο. Όσον αφορά στην πληροφοριακή στήριξη, οι παιδίατροι κατατάσσονται πρώτοι (73%), ακολουθούμενοι με μικρή διαφορά από τις γιαγιάδες από τη πλευρά της μητέρας (69%), με λιγότερο από το ένα τέταρτο των συμμετεχουσών να δηλώνουν το σύντροφο, άλλους επαγγελματίες υγείας, άλλα μέλη της οικογένειας ή φίλους ως πηγή πληροφοριακής στήριξης. Τέλος, ενώ η στήριξη από συναδέλφους και το ευρύτερο εργασιακό περιβάλλον ήταν σε μέτρια επίπεδα, οι γυναίκες δεν φάνηκε να αξιολογούν τον εργασιακό χώρο ως φιλικό για το ΜΘ όσον αφορά τις εγκαταστάσεις ($M = 2.74$, $TA=0.99$) και την τεχνική υποστήριξη ($M = 2.92$, $TA=1.62$) σε κλίμακα τύπου Likert 7 σημείων.

Συμπεράσματα: Τα ποσοστά αποκλειστικού θηλασμού στην Κύπρο είναι ιδιαίτερα χαμηλά, ακόμα και κατά την παραμονή στο μαιευτήριο, εύρημα το οποίο χρήζει περαιτέρω διερεύνησης. Σε συνδυασμό με το γεγονός ότι το παρατηρούμενο ποσοστό καισαρικών κατατάσσουν την Κύπρο στις υψηλότερες θέσεις στην Ευρώπη, αναδεικνύει την ανάγκη για σχεδιασμό παρεμβάσεων προστασίας του θηλασμού. Η χαμηλή αυτοπεποίθηση για μητρικό θηλασμό κατά τις πρώτες 48 ώρες, όπως αξιολογήθηκε με την κλίμακα BFSE, φαίνεται να είναι ισχυρός προβλεπτικός παράγοντας τόσο για την

αποκλειστικότητα όσο και την πρόωπη διακοπή του θηλασμού. Επομένως, η υιοθέτηση της κλίμακας στην κλινική πρακτική στο πλαίσιο της αξιολόγησης της αυτοπεποίθησης για ΜΘ κρίνεται σημαντική τόσο κατά την παραμονή στο μαιευτήριο όσο επίσης και κατόπιν στη κοινότητα. Επίσης, με βάση την αξιολόγηση των ίδιων των γυναικών, οι «καλές πρακτικών» στη βάση των 10 βημάτων για επιτυχή θηλασμό δεν τυγχάνουν ευρείας και συστηματικής εφαρμογής στα μαιευτήρια της Κύπρου. Το γεγονός ότι η πιθανότητα μια μητέρα να θηλάσει και να θηλάσει αποκλειστικά σε βάθος χρόνου σχετίζεται με τις πρακτικές που εφαρμόζονται λιγότερο συστηματικά στα μαιευτήρια της Κύπρου αναδεικνύει την άμεση ανάγκη για περαιτέρω ενδυνάμωση της Εθνικής Στρατηγικής (2011) και Πολιτικής (2015) για το ΜΘ ώστε να συμπεριλαμβάνει σχετικές παρεμβάσεις και μέτρα για την προστασία, προαγωγή και στήριξη του μητρικού θηλασμού, τόσο όσο αφορά στη χάραξη σχετικών πολιτικών υγείας όσο και στην εφαρμογή και αξιολόγηση προγραμμάτων εκπαίδευσης και στήριξης στη κοινότητα τόσο στην προγεννητική όσο και κατά τη μεταγεννητική περίοδο.

Λέξεις κλειδιά: Μητρικός Θηλασμός, Αποκλειστικός Μητρικός Θηλασμός, Μητρική Αυτοπεποίθηση για Θηλασμό, 10 Βήματα για Επιτυχή Θηλασμό, Κοινωνική Στήριξη στη Φροντίδα του Νεογνού, Στήριξη Θηλασμού στο Χώρο Εργασίας

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ABBREVIATIONS

BF	Breastfeeding
EBF	Exclusive Breastfeeding
PBF	Predominant Breastfeeding
FBF	Full Breastfeeding
CBF	Complimentary Breastfeeding
NBF	Non Breastfeeding
BM	Breast Milk
IFP	Infant Feeding Practices
WHO	World Health Organization
UNICEF	United Nations Children's Fund
WHA	World Health Assembly
AFNMU	Australian Food and Nutrition Monitoring Unit
MDGs	Millennium Development Goals
EMBASE	Excerpta Medica database
EGF	Epidermal Growth Factor
GHRF	Growth Releasing Factor
IGF-I	insulin-like growth factor I
BDNF	Bain-derived neurotrophic factor
GDNF	Glial cell-line derived neurotrophic factor
BFSE	Breastfeeding Self-Efficacy
SigA	Secretory IgA
IBFAN	International Baby Food Action Network
IGF-1	Insulin-like growth factor I
BSES	Breastfeeding Self-Efficacy Scale
WBSS	Workplace Breastfeeding Support Scale
BFHI	Baby Friendly Hospital Initiative
IGAB	Interagency Group for Action on Breastfeeding
IYCF	Infant and Young Children Feeding
C/S	Cesarean Section
NICU	Neonatal Intensive Care
FIFI	Fathers Infant Feeding Initiative

RCT	Randomized Control Trial
ABA	Australian Breastfeeding Association
BFW	Breastfeeding Friendly Workplace
WIC	Women Infant Children program
PRAMS	Pregnancy Risk Assessment Monitoring System
IFPS	Infant Feeding Practices Survey
IBFAT	Infant Breastfeeding Assessment Tool
PROBIT	Promotion of Breastfeeding Intervention Trial
HCPs	Health Care Professionals
SBS	Seeing Breastfeeding Scale
PBSES	Prenatal Breastfeeding Self-efficacy Scale
IMS	Insufficient Milk Supply
IFIS	Infant Feeding Intentions Scale
BPEBI	Breastfeeding Personal efficacy Beliefs Inventory
BAPT	Breastfeeding Attrition Predictive Tool
PBS	Positive Breastfeeding Sentiment
NBP	Negative Breastfeeding Sentiment
PBSAT	Perceived Breastfeeding Support Assessment Tool
PICSS	Perceived Infant Care Social Support Scale
WBSS	Workplace Breastfeeding Support Scale
ANOVA	Analysis Of Variance

INTRODUCTION

Breastmilk is the ideal source of infant nourishment for the first six months of life, with a dynamic composition to cover both infant nutritional and developmental requirements. Extensive literature has confirmed of the unique and complex composition of breast milk as well as the beneficial short-term and long-term infant and maternal health effects. However, the very low prevalence of breastfeeding, and the even lower exclusive breastfeeding for over three decades have enhanced breastfeeding to an issue of high public health importance. In order to tackle the low BF rates, WHO in collaboration with UNICEF developed a number of initiatives that aimed of breastfeeding support, protection and promotion, including the *International Code of Marketing of Breastfeeding Substitutes* (1981), “*The Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding*” (1990), the “*Baby Friendly Hospital Initiative*” (1991) through the the implementation of breastfeeding promoting maternity services, widely known as “*Ten Steps to Successful Breastfeeding*” (WHO, 1991). In 2002 the Global Strategy for Infant and Young Child Feeding was published that aimed to reinstate the aims of the previous initiatives to promote, support and protect BF. As a result, during the following decades, an increase in BF initiation rates was apparent in many developed countries, but BF duration rates were still well below the international and national targets even from the first months.

The most common perceived reason for BF discontinuation is breast milk insufficiency, followed by difficulties emerged during breastfeeding (such as mastitis, sore nipples) and return to work (Dennis, 2002; Thulier and Mercer, 2009). However, premature BF discontinuation is a result of an interplay of multiple factors related with BF that determine maternal breastfeeding behavior. These factors interact to each other at different levels (intra-personal characteristics, inter-personal influences, influences at an organizational and policy level as well as the extent that the community accepts BF as a social norm) within a complex framework of interplay of influences that will eventually determine maternal decision of BF initiation and duration such as personal characteristics, community support of BF, national policies and strategies, family support, adherence to the good maternity practices.

Sufficient evidence suggests that maternal breastfeeding self-efficacy is a predictor of BF initiation, continuation and exclusivity. According to Bandura's Theory of Self-efficacy (1977, 1994) a strong sense of self-efficacy results to a positive perception and success-promoting thought patterns in relation with the individual's ability to execute and achieve a specific behavior. Thus, mothers with high levels of BFSE are more likely to initiate and continue BF and EBF, by overcoming potential problems and barriers with a positive way (Hinich, 2016). On the contrary, low BFSE is associated with BF behavior perceived as discouraging and overwhelming increases the risk of premature BF discontinuation. A number of different factors might influence an individual's self-efficacy. These factors describe the four sources of information of Self-efficacy that will form self-efficacy expectancies. Among these factors are socio-demographic characteristics and other maternal characteristics, community and professional support. One of the potential influences of BSFE is the implementation of the "good maternity practices", known as the "10 Steps to Successful Breastfeeding". Mothers that experienced the "10 Steps to Successful Breastfeeding" are more likely to acknowledge the importance of BF and to achieve the intended BF duration and exclusivity irrespective of the maternal characteristics including socio-economic characteristics.

The doctoral thesis is divided into two parts: the general and the specific part. In the general part:

Chapter 1 provides a brief review of the nutritional composition of human milk and the plethora of bioactive compounds that have been ascribed for the beneficial short- and long-term effects of breastfeeding on both infant and maternal health. Further, it briefly provides evidence on the short and long term effects of breastfeeding on both infant and maternal health. It concludes with the provision of the international and national recommendations and targets on breastfeeding as well as a reference to the aims and the up to date achievements of the joint UNICEF/ WHO initiatives launched for the protection and promotion of breastfeeding.

In *Chapter 2*, a reference to the historical development of breastfeeding indicators and their definitions was made and to the potential methodological issues that might be raised in the attempt of measurement of breastfeeding and exclusive breastfeeding as well as a brief description of WHO BF indicators. A brief review of the latest evidence of the prevalence of breastfeeding and exclusive breastfeeding initiation and continuation up to the first six months in developed and developing countries. A more detailed description

the epidemiological studies conducted in Greece and Cyprus in relation with the estimation of the prevalence of Breastfeeding. It concludes with a discussion on the potential determinants of BF as explained within the context of the social ecological model, emphasizing to the complexity defined by the interaction of numerous factors within and between different levels that determine the final maternal decision on BF.

Chapter 3 focuses on the importance of the Baby-Friendly Hospital Initiative (BFHI) demonstrated by the current situation to the adherence to the “*10 Steps to Successful Breastfeeding*” globally. Evidence supports the positive effects of full or partial or individual implementation of the baby friendly maternity practices on BF initiation, continuation and exclusivity.

Chapter 4 is divided into two sections. In the first section, Bandura’s (1977) theoretical framework of maternal breastfeeding self-efficacy was elaborated focusing on the sources of influence of self-efficacy expectations and the determinants of self-efficacy. The second section provides a comprehensive description of the operational definition of BFSE and presents the existing maternal BFSE-specific tools.

In the specific Section, a documentation of the aims is provided (*Chapter 7*), followed by a detailed description of the BrEaST project, the methodology (*Chapter 8*) and the findings of the study (*Chapters 9, 10,11, 12*). Finally, the last two chapters (*Chapter 13 and 14*) focus on the discussion of the findings of this study and their implications to the community, maternity facilities.

Importance and Originality of the present study

This is the first nationwide study conducted in Cyprus to estimate prevalence of breastfeeding and exclusive breastfeeding among a representative sample of Cypriot mothers within the first 48 hours and up to the sixth month after birth as well as the identification of the determinants of BF initiation and continuation. Specifically, it focuses on the identification of the main socio-demographic and other determinants of BF initiation, continuation and exclusivity up to the sixth month among Cypriot mothers. It, further, provides evidence of the implementation of the BFHI’s maternity practices among the maternity facilities in Cyprus and it estimates maternal self-efficacy in relation with breastfeeding for the first time. Furthermore, it is the first study that investigates the

association of the 10 Steps to Successful Breastfeeding with maternal Breastfeeding Self-Efficacy (BFSE) within the first 48 hours after birth and in the long run.

The topic, as well as the findings, of the current study are important in the context of further developing the existing National Strategy for Breastfeeding. The thesis provides first-time robust evidence on the prevalence and determinants of breastfeeding in Cyprus and identifies gaps in the implementation of good maternity practice. The study provides ample evidence to suggest that current practices across Cypriot midwifery clinics are sub-optimal and calls for the urgent need for developing, promoting, implementing and evaluating response measures to protect, promote and support breastfeeding. Thus, the findings are of scientific as well as of clinical and organizational interest. They could provide a basis for the development of relevant public health policies and inform clinical and community practice in order to improve the services provided to mothers and infants.

In addition to the fact that this dissertation constitutes the first attempt to study this important issue in Cyprus, the study is a significant contribution to the international literature both in terms of the methodology as well as the theoretical approach. In terms of the methodology, several studies in the international literature often base the assessment of breastfeeding indicators on retrospective recall. Due to its prospective design, the present study compares different methodological approaches for the estimation of BF indicators (self-reported current status, retrospective event calendar and 24-hour recall method). From a theoretical point of view, the originality of the study lies in the adoption of a holistic view of the determinants of breastfeeding in the context of the socio-ecological model as opposed to the majority of studies in the international literature which tend to focus on individual factors.

Contribution of the study

The present study delineates for the first time the Cyprus reality in relation to breastfeeding and to allow the formulation of targeted policies by health services. At a national level, findings of the study constitute the only available source of information in relation to

(a) the current practices of maternity care facilities nationwide in relation to protecting and promoting breastfeeding, which appear sub-optimal. The findings can inform the

adoption of targeted measures by policy makers as well as health professionals to improve clinical practice,

(b) epidemiological data on the initiation, exclusivity of breastfeeding during the first six months of the infants life, which highlight the magnitude of the problem in the context of the WHO recommendations. This first-time BF indicators can be used by future studies as a baseline measure to evaluate the effectiveness of policy measures against set targets,

(c) a range of determinants of BF continuation (or premature discontinuation), including perceived infant care social support and the role of workplace environment on discontinuation after return to work, highlighting the need for policy measures to approach the problem in a more comprehensive and holistic manner in order to address issues beyond the healthcare system, and

(d) levels of breastfeeding self-efficacy among Cypriot mothers which appear to be only moderate which can be considered a challenge in the context of improving maternity care services. Furthermore, the study provides evidence to suggest that it is the strongest determinant of initiation, exclusivity and continuation of breastfeeding. The tool used in this study to measure breastfeeding self-efficacy can be adopted in clinical practice as a screening tool for the early identification of mothers at higher risk of premature discontinuation of breastfeeding identifying mothers.

Overall, the study findings can be used for the improvement of health services provided to Cypriot future mothers and the development of public health policies which aim to protect, promote and support breastfeeding throughout its duration.

Part I:

General Section

Chapter 1:

Benefits of Breastfeeding

Chapter 1 outlines the composition of human milk (**Section 1.1**) in terms of nutritional, bioactive and other components. A brief description of infant and maternal health effects of breastfeeding is also provided (**Section 1.2**) describing short- and long- term benefits of breastfeeding observed in epidemiological studies.

1.1. Human Milk Composition

Breast milk is considered the cornerstone of infant nourishment and health. The complex and inimitable composition of human milk is modified with lactation in order to adapt to infant nutritional and developmental requirements (Riordan and Wamback, 2010; Ballard and Morrow 2013; Gartner *et al.*, 2005). Both its nutritional composition as well as its bioactive components have been advocated for the numerous beneficial health effects of breast milk which protects against infant mortality and morbidity and influences metabolic programming in early life that persists in adulthood (Andreas, Kampmann and Mehring Le-Doare, 2015).

This chapter provides a brief review of the nutritional composition of the human milk and the plethora of bioactive compounds that have been ascribed for the beneficial short- and long-term effects of breastfeeding on both infant and maternal health.

1.1.1 Nutritional Composition

Human milk confers an optimal nutritional value. The nutrient concentrations fluctuate within a range of values over time (Riordan and Wamback, 2010) in order to meet exclusively the infant's nutritional requirements for the first six months (Kramer and Kakuma, 2002; 2004; 2009; 2012). Differences in the nutritional composition of colostrum, the breast milk produced only for 2-4 days after birth (Thapa, 2005) and mature milk were documented (Riordan and Wamback, 2010). In general, water is the main constituent of breast milk at 87%, followed by fat at 3.8%, lactose at 7% and protein at 1% (Martin, Ling and Blackburn, 2016). **Table 1.1** presents a more detailed depiction of the nutritional composition of mature breast milk.

Energy and Fat Content

Variations in the energy content of breast milk depend on the total fat content, which is the most variable micro-nutrient of human milk. Fat comprises about fifty percent of its caloric concentration and is mainly present in the human milk in the form of triglycerides (Riordan and Wamback, 2010; Andreas, Kampmann and Mehring Le-Doare, 2015; (Martin, Ling and Blackburn, 2016). These are digested to smaller fragments of free fatty acids and monoglycerides by gastric lipase which is present in both the infant intestine and the human milk (Field, 2005; Riordan and Wamback, 2010; Martin, Ling and Blackburn., 2016). Lipids, also, provide the essential fatty acids, α -linolenic and linoleic and polyunsaturated fatty acids that are converted to arachidonic acid (AA) and eicosapentaenoic acid (EPA) (Riordan and Wamback, 2010; Martin, Ling and Blackburn, 2016). The latter is subsequently converted to docosahexaenoic acid (DHA) (Martin, Ling and Blackburn, 2016). Essential fatty acids and their derivatives have been implicated in normal infant growth and optimal development of visual, immune and cognitive function (Oddy, 2002; Giribaldi *et al.*, 2012; Martin, Ling and Blackburn, 2016). They act as precursors of many hormones and mediators as well as carriers of fat-soluble vitamins (Oddy, 2002). Moreover, they are structural components of the cellular membranes (Oddy, 2002; Stam *et al.*, 2013). Lipid composition of breast milk from obese mothers differs from normal-weight mothers, with higher amounts of SFA and trans FA and lower of amounts of PUFA and MUFA (Panagos, Matthan and Sen, 2014)

Carbohydrates

Lactose is the most prevalent carbohydrate of the human milk and provides forty percent of the energy concentration (Ballard and Morrow, 2013; Stam *et al.*, 2013; Andreas, Kampmann and Mehring Le-Doare, 2015; Martin *et al.*, 2016). While lactose is very low in colostrum, it reaches its final concentration (Riordan and Wamback, 2010; Ballard and Morrow, 2013; Martin *et al.*, 2016) at about 6g/L (Stam *et al.*, 2013) after few days and remains constant throughout lactation (Riordan and Wamback, 2010; Ballard and Morrow, 2013; Martin, Ling and Blackburn, 2016).

Protein

Protein in the human milk comprises of two main groups, whey and casein. Whey is easily digested in the stomach by comparison to casein. For this reason, colostrum is mainly comprised of about 70-80% whey-derived proteins (Martin, Ling and Blackburn, 2016).

As lactation progresses, whey content gradually decreases in the mature breast milk and it is replaced by casein until the casein-to-whey ratio becomes 50:50 (Donovan, 2006; Riordan and Wamback, 2010). Both categories include compounds with multiple metabolic and immunological functions, including α -lactalbumin, lactoferrin, immunoglobulins, serum albumin, lipase, amylase and lysozyme (Riordan and Wamback, 2010; Ballard and Morrow, 2013; Martin, Ling and Blackburn, 2016). In general, breast milk protein is reduced from 1.4-1.6gr/100ml in early lactation to 0.8 to 1.0gr/100ml at three to four months and to 0.7-0.8 gr/100ml at six months (Martin, Ling, and Blackburn, 2016).

Vitamins and Minerals

Table 1.1 presents the content of several vitamins and minerals. The content of many micronutrients in the breast milk varies and is influenced by maternal nutritional status. Such micronutrients are thiamin, riboflavin, vitamin B-6, vitamin B-12, choline, retinol, vitamins A, vitamin D, selenium, and iodine (Allen, 2012; Ballard and Morrow, 2013). Others, such as folic acid, calcium, iron, copper and zinc, remain unchanged regardless of the maternal nutrient stores or intake. Thus low maternal intake of these micronutrients mainly affects maternal rather than the infant's nutritional status (Allen, 2012).

Table 1.1: *Nutritional Composition of Mature Human Milk*

Content per 100ml	Mature Breast Milk
Water (ml)	87,1
Energy (kcal)	65-75
Proteins (gr)	1.2-1.4
Lipids (gr)	3.7-4.8
Carbohydrates (gr)	7.1-7.8
Metals and Minerals	
Calcium (mg)	32-36
Phosphorous (mg)	14-15
Sodium (mg)	11-20
Potassium (mg)	57-62
Magnesium (mg)	2.6-3.0
Iron (µg)	62-93
Copper (µg)	400
Zinc (mg)	3-5
Selenium (µg)	13-50
Vitamins	
Vitamin A (µg)	40-76
Vitamin D (IU)	2.2
Vitamin K (µg)	1.5
Vitamin E (mg)	0.29-0.39
Vitamin B1 (µg)	13-21
Vitamin B2 (µg)	31
Vitamin B12 (µg)	0.01
Folic acid (µg)	3.1-6.2
Vitamin C	3.1-4.5

Source: Zampelas (2003) Nutrition at Different Life Stages pages 70-71

1.1.2 Bioactive Compounds

Human milk contains a variety of bioactive compounds with multiple functions. There are mainly of anti-inflammatory and immunological importance to support and enhance infant immune system during the first months of life.

1.1.2.1 Immunoglobulins

The anti-inflammatory and immunomodulating components constitute the host defense system of the human milk. The colostrum contains high concentrations of these substances during the first days, in order to provide sufficient immunological protection until the infant's immune system matures and becomes more functional (Andreas, Kampmann and Mehring Le-Doare, 2015). IgA, specifically SIgA, is the main immunoglobulin agent in the breast milk (Orlando, 1995; Oddy, 2002; Andreas, Kampmann and Mehring Le-Doare, 2015). It reaches its maximum concentration in the breast milk, of up to 12 mg/ml, (Newburg and Walker, 2007; Andreas, Kampmann and Mehring Le-Doare, 2015) during the first 3-4 days after birth (Orlando, 1995) and decreases to 1mg/ml in the mature milk (Newburg and Walker, 2007; Andreas, Kampmann and Mehring Le-Doare, 2015). SIgA antibodies specific to certain gastrointestinal and respiratory infectious agents such as *E. coli*, *Clostridium difficile*, *Shigella*, *Salmonella*, *rotavirus*, *V. cholera*, *S. pneumoniae*, *Shigella*, *C. Botulinum* are present in the human milk (Riordan and Wamback, 2010; (Andreas, Kampmann and Mehring Le-Doare, 2015; Rabet, Vos and Garssen, 2008). This is mainly due to the fact SIgA is not influenced by the presence of proteolytic enzymes of the gastrointestinal track and, thus, it can bind pathogens and inhibits their adherence on the epithelium mucosa (Lönnerdal, 2013; Andreas, Kampmann and Mehring Le-Doare, 2015). Human milk also contains other immunoglobulins (e.g, IgM, IgD, IgG, Ig E) that have been implicated in the stimulation of the infant immune system (Riordan and Wamback, 2010). In contrast to SIgA, these immunoglobulins are easily digestible and inactivated in the intestine (Lönnerdal, 2013).

1.1.2.2 Human milk oligosachharides (HMO)

Human milk oligosachharides (HMO) are a type of non-nutritive, non-digestible carbohydrates found in high concentrations during early lactation (Stam *et al.*, 2013), which later decreases as lactation progresses (Stam *et al.*, 2013). Among other human milk compounds, they participate to the colonization of the infant gastrointestinal tract by commensal microbiota, which in turn has been implicated in the formation of immunoglobulin SIgA and the regulation of cytokine response (Donovan, 2006). They act as prebiotics that promote the growth of intestinal microbiota, specifically of *Bifidobacterium bifidum*, that participate in the immune system by increasing the intestinal acidity (Riordan and Wamback, 2010) and binding pathogens (Martin, Ling and Blackburn, 2016). Thus, HMOs protect the gastrointestinal tract against the adherence of specific pathogenic bacteria such as *Shigella*, *Salmonella*, *Listeria*, *Campylobacter* and *E. coli* (Bode, 2009; Riordan and Wamback, 2010; Martin, Ling and Blackburn, 2016). The HMO composition varies in the human milk resulting to different prebiotic effects (Bode, 2009). They have been implicated in the protection against neonatal diarrhea and respiratory tract infections (Andreas, Kampmann and Mehring Le-Doare, 2015).

1.1.2.3 Hormones and Growth Factors

Many hormones and growth factors have been identified in the human milk. They have many anti-inflammatory properties. They are involved in the differentiation, development and functional maturation of many organ systems, including the immune system, the gastrointestinal track, cardiovascular, reproductive and neuroendocrine systems (Field, 2005; Ballard and Morrow, 2013). This includes growth hormone, insulin, insulin-like growth factor I (IGF-I), epidermal growth factor (EGF), prolactin and growth releasing factor (GHRF) and neuronal growth factors (Oddy, 2002). **Table 1.2** summarizes some of the functions and properties of the aforementioned substances.

Furthermore, human milk contains leptin, a hormone that is implicated in the regulation of appetite and the mechanism of obesity development (Riordan and Wamback, 2010). Even though, infant physiological functions of cortisol have not been elucidated, it has been suggested to regulate the mineral and fluid transport and absorption in the intestine and pancreas growth (Riordan and Wamback, 2010). Furthermore, it might suppress the production of immunoglobulins in the human milk (Riordan and Wamback, 2010)

1.1.2.4 Enzymes

Breast milk contains a number of enzymes that enhance passive immunity against infections. In particular, lysozyme, which is an active enzyme present in human milk at high concentrations, has an anti-bacterial and anti-inflammatory effect against gastrointestinal infections (Riordan and Wamback, 2010; Lönnerdal, 2013). It has been suggested that lysozyme, along with lactoferrin, has a bactericidal activity (Riordan and Wamback, 2010). Lysozyme passes the gastrointestinal track unaffected and, thus, it can cause lysis of the Gram positive and Gram negative bacteria (Newburg and Walker, 2007). Lactoferrin is the most predominant protein in the human milk. It has anti-inflammatory, bactericidal, antiviral and fungicidal properties (Riordan and Wamback, 2010; Lönnerdal, 2013). Specifically, the bacteriostatic properties of lactoferrin, conferred by its free-iron binding properties, inhibit iron utilization by many bacteria for their growth, such as *E.coli*, *Candida albicans*, *Giardia* (Riordan and Wamback, 2010; Lönnerdal, 2013; Oddy, 2002), *Streptococcus mutans*, *Streptococcus pneumoniae* (Lönnerdal, 2013). Lactoferrin also contributes to the production of lymphocytes (Riordan and Wamback, 2010) and phagocytosis activation (Newburg and Walker, 2007).

1.1.2.5 Nucleotides, Nucleosides and metabolites

Nucleotides, nucleosides and metabolites in human milk are involved in various metabolic pathways, including lipid metabolism and lipoprotein production. They are also involved in the development and differentiation of organs and tissues and the regulation of the immune function through the increase immunoglobulin synthesis and the lymphocyte proliferation, NK activity and macrophage activation (Field, 2005).

1.1.2.6 Cytokines and Chemokines

The main function of cytokines and chemokines in the human milk is the activation of the immune system in the presence of an infection (Riordan and Wamback, 2010; Ballard and Morrow, 2013). They have also been implicated in the growth and differentiation of the mammary gland (Riordan and Wamback, 2010).

1.1.2.7 Leukocytes

Human milk contains active and functional cells including two types of leukocytes: phagocytes and lymphocytes (Riordan and Wamback, 2010; Oddy, 2002). Macrophages are the predominant type of cells of phagocytes (Riordan and Wamback, 2010). They are

involved with phagocytosis, release of IgA (Riordan and Wamback, 2010; Field, 2005) and the synthesis of lactoferrin and lysozyme (Riordan and Wamback, 2010) as well as in T and B cell function through the expression of markers that participate in their activation (Field, 2005). Lymphocytes are mainly of T-cell origin (Riordan and Wamback, 2010; Field, 2005; Oddy, 2002). They are involved in the so-called cell-mediated immunity (Riordan and Wamback, 2010) where T-cells are activated in the presence of pathogens in order to destroy the infected cells (Riordan and Wamback, 2010).

1.1.2.8 Other Components

There are many compounds in the human milk for which the mechanism of their action is still unclear. In addition to their anti-oxidant function, vitamins A, C and E seem to have an anti-inflammatory function (Field, 2005; Riordan and Wamback, 2010). Prostaglandins, a specific lipid-derived group, are involved in an array of physiological functions. A specific form of prostaglandins, PGE₂ and PGF_{2a}, has a cytoprotective effect on the intestinal epithelium (Riordan and Wamback, 2010). Haptocorrin, a vitamin B12-binding protein (Newburg and Walker, 2007; Lönnerdal, 2013), has an identical role to the intrinsic factor; that is to facilitate the absorption of vitamin B12 (Lönnerdal, 2013).

Table 1.2 summarises the functions of the several of the bioactive compounds found in human milk. In summary, human milk contains of numerous components with a composition that alters diurnally and over lactation to support infant health and development. Most of these components have diverse roles including immunological, anti-bacterial, anti-inflammatory and other properties to sustain and protect the immature infant gastrointestinal and immune system during the first months of life. Several compounds appear to have long-term beneficial effects on infant health against chronic diseases including asthma, cardiovascular diseases, childhood cancer etc. Such compounds are growth factors and hormones, enzymes, immunoglobulins, cytonines and more others.

Table 1.2: Functions of Major Bioactive Compounds in the Human Milk

Components		Functions
Enzymes		
<i>Amylase</i>		Digestion of carbohydrates
<i>Lipase</i>		Lipid Hydrolysis; Bacteriocidal, anti-viral and anti-microbial (gram-positive) activity;
<i>Lysozyme</i>		Bacteriocidal and anti-inflammatory
<i>Proteases, anti-proteases</i>		Protein breakdown
Growth Factors/ Hormones		
<i>EGF</i>		Proliferation of the intestinal mucosa and epithelium; a type of cytokine
<i>IGF</i>		Protects intestinal cells from impairment; Enhances erythropoiesis and hematocrit levels; growth-promoting agent
<i>Neuronal Growth Factors</i>		Maturation of the enteral neural system (ENS); BDNF: peristalsis of the gut; GDNF: prolongs neuron survival
<i>Cholecystokinin (CCK), Insulin, Thyroxine</i>		Promotion of infant GI tract maturation, intestinal host defense; protection against hypothyroidism (Thyroxine); enhance digestion (CCK)
<i>Calcitonin/ somatostatin</i>		Development of the neuroenteric system; regulation of intestinal epithelium growth
<i>Adiponectin/ Leptin/ Ghrelin</i>		Regulation of infant metabolism and weight; Regulation of appetite and energy conversation
<i>Thyroxine and Thyrotropin Releasing Hormone (TRH)</i>		Stimulation of maturation of the GI tract; reduction of the risk of hypothyroidism
<i>Cortisol</i>		Functions not clear: control of fluids; suppression of immunoglobulin-producing cells; maturation of pancreas
<i>Prolactin</i>		Differentiation and maturation of neuroendocrine, reproductive and immune systems
Proteins		
<i>Casein</i>		Inhibition of microbial adhesion in the intestinal mucosa
<i>Lactoferrin</i>		Antibacterial activity; free-iron binder bacteriostatic activity
<i>α-lactalbumin</i>		Synthesis of lactose, binding of Ca and Zn ions
<i>Haptocorrin</i>		Vitamin B-12 protein; anti-microbial; stable against proteolytic enzymes
Carbohydrates		
<i>Lactose</i>		Main energy source; facilitates the absorption of Ca, Mg, Mn

Components	Functions
<i>HMOs</i>	Prebiotics-enhance a diverse and balanced gut microbiota, inhibit pathogen adherence; anti-inflammatory and anti-infective agents;
Anti-inflammatory and Immunomodulating Components	
<i>Immunoglobulins (IgA/sIgA, IgG, IgM)</i>	Anti-inflammatory; Anti-microbial; inhibit pathogen binding;
<i>Cytokines/ chemokines</i>	Proinflammatory and immunodulatory agents: activation of the immune system, enhance growth and differentiation of the mammary gland,
Cells	
<i>Macrophages</i>	Phagocytosis; IgA release; Activation of T cells
<i>Lymphocytes</i>	Cell-mediated immunity

Sources: Riordan & Wamback (2010); Ballard & Morrow (2013); Martin, Ling, & Blackburn (2016); Oddy (2002)

1.2. Health Effects of Breastfeeding

Breastfeeding confers well-recognized and documented health benefits to both the infant and the mother. In the case of the infant, these include both short-term as well as long-term nutritional, developmental, cognitive and psychological benefits. For the breastfeeding mother, both psychological as well as health protective effects have been described. There are several published reviews on the subject. Thus, it was not the intention of this thesis to provide an original review of the plethora of epidemiological evidence. The main aim of this section is to provide a brief description of the beneficial health effects of breastfeeding in the short- and long- term both for the infant and the mother based on epidemiological evidence with a focus on previously published reviews (Allen and Hector, 2005; B. Horta and Victora, 2013; B. L. Horta and Victora, 2013) with occasional reference to additional evidence from single studies, if and where necessary. The strongest evidence in terms of the beneficial effects of breastfeeding concerns the short-term protection against infections (B. Horta and Victora, 2013). Other protective effects have been described in the literature, even though the evidence remains inconclusive for other diseases such as Type 1 and Type 2 Diabetes (Allen and Hector, 2005).

1.2.1 Benefits of breastfeeding to the Infant

1.2.1.1 Short Term-Effects

The short-term effects of breastfeeding are well documented, especially for mortality and morbidity from infectious diseases. The beneficial short-term health effects of breastfeeding are predominately observed in developing countries, but also in developed countries (Allen and Hector, 2005; B. Horta and Victora, 2013).

Breastfeeding against Infectious Diseases

The protective effect of breastfeeding has been extensively documented with regards to the incidence and the severity of respiratory and gastrointestinal infections, otitis media, urinary tract infections (Gartner *et al.*, 2005). Numerous studies have demonstrated that exclusive breastfeeding provides significant protection against infections in comparison

with formula feeding or non-exclusive breastfeeding (Kramer *et al.* 2001; Duijts *et al.*, 2010; Ladomenou *et al.*, 2010). This association is stronger for gastrointestinal than respiratory infections (Kramer *et al.* 2001). The seminal PROBIT study (Kramer *et al.* 2001) ascertained a reduced risk by 40% of one or more gastrointestinal infections for exclusively breastfed infants and by 16% for respiratory infections. Specifically, a duration/dose response relationship was observed (Duijts *et al.*, 2010) with the incidence of infections being lower for infants exclusively breastfed for more than four months than formula-fed or breastfed infants. Howie *et al.* (1990) indicated reduced infant morbidity by gastrointestinal infections for infants that were breastfeeding for 13 weeks or more for the first year of life (Howie *et al.*, 1990). In a meta-analysis, exclusive breastfeeding for four or more months was associated with 72% reduction in the risk of hospitalization admissions from respiratory infection (Oddy and Peat, 2003).

Breastfeeding against Sudden Infant Death Syndrome (SIDS)

There is sufficient evidence suggesting that breastfeeding is associated with reduced risk of SIDS. A meta-analysis reported that breastfeeding was associated with a reduced risk of SIDS by 36% (Ip *et al.*, 2007). A more recent meta-analysis (Thompson *et al.* 2017) indicated an association between BF and EBF duration with SIDS. Specifically, BF and EBF for two months or longer reduces the risk of SIDS by 50%, whereas no protective effect was observed when BF and EBF duration was less than two months.

1.2.1.2 Long-Term Effects of Breastfeeding

There is sufficient evidence that breastfeeding is protective against several long term adverse health outcomes. These include chronic respiratory diseases such as asthma and other atopic diseases, type 1 and type 2 diabetes, childhood cancers, obesity as well as factors of cardiovascular disease and cognitive development (Ip *et al.*, 2007; B.L. Horta and Victora, 2013; Horta, Loret De Mola and Victora, 2015).

Breastfeeding against Asthma and other Atopic Diseases

Breastfeeding has been associated with reduced risk of asthma and other atopic disorders, however, evidence has been controversial (Sears *et al.*, 2002; Lodge *et al.*, 2015). Exclusive breastfeeding for 3-4 months was associated with reduced incidence of asthma, atopic dermatitis and eczema by 27% in a low-risk population to 42% in infants with a family history of atopic disorders (Greer, Sicherer and Burks, 2008). A recent systematic review confirmed the protective effect of breast feeding on asthma but found only a weak inverse association between eczema and allergic rhinitis (Lodge *et al.*, 2015). In fact, Verduci *et al.* (2017) have shown a dose-effect response with longer duration of exclusive breastfeeding. Specifically, exclusively breastfed infants for 4 months were less likely to have wheezing in comparison with infants that breastfed exclusively only for about 2.5 months. Each extra month of exclusive breastfeeding was associated with a reduced risk of wheezing by 11% and recurrent wheezing by 15% at 12 months of age (Verduci *et al.* 2017). Furthermore, in a prospective cohort study conducted with the recruitment of 2,602 infants during pregnancy, cessation of exclusivity of breastfeeding sooner than the 6th month increases the risk of wheezing within the first year of life (Oddy, 2002). The protective effect of exclusive breastfeeding on asthma incidence persisted in later age. According to Oddy *et al.* (2002) premature discontinuation of exclusive breastfeeding (<4 months) is associated with a two-fold increased risk of asthma at six years.

Breastfeeding and Type 1 and 2 Diabetes

Breastfeeding confers better glycaemia profile during infancy (Young *et al.*, 2002; Owen *et al.*, 2006; Stolzer, 2011). This beneficial effect on insulin seems to be preserved in later life, even though the effect might not be as significant (Owen *et al.*, 2006). Nevertheless, the inverse association of longer breastfeeding appears stronger with regards to type 1

and type 2 diabetes, and in particular if breastfeeding is exclusive (Stolzer, 2011). The protective effect was confirmed from the findings of two cohorts of Nurses' Health Study, a prospective cohort study (NHS) with the participation of 83 585 parous mothers and a retrospective cohort study (NHS II) of 73 418 parous mothers. Specifically, the authors indicated that breastfeeding for more than one year was associated with a 44% and a 39% reduction in the incidence of type 2 diabetes risk in later life (Stuebe *et al.*, 2015). In a meta-analysis of 10 observational studies (6 cohort and 4 cross-sectional), Horta *et al.* (2015) identified a protective effect of breastfeeding on the incidence of diabetes (pooled OR: 0.65 95% CI: 0.49, 0.86). The reduction of risk associated with exclusive breastfeeding appears even larger, based on a review of evidence (Ip *et al.* 2007). The high PUFA concentrations in breastmilk have been associated to an increase of PUFA levels in the skeletal muscles that are implicated in the improvement of insulin sensitivity and the regulation of fasting glucose levels (Das, 2007). Another possible mechanism which was suggested was the passive immunological protection that breastfeeding confers against the development of type 1 diabetes. On the other hand, cow milk contains a specific protein, β -lactoglobulin that might activate the mechanism of the development of type 1 diabetes (Ip *et al.*, 2007).

Breastfeeding and Inflammatory Bowel Disease

The effect of breastfeeding on the development of Inflammatory Bowel Disease (IBD) is inconclusive (Mikhailov and Furner, 2009; Riordan and Wambach, 2010). A meta-analysis (Klement *et al.*, 2004) of 17 studies presented a protective effect of breastfeeding on Crohn disease (pooled OR: 0.67; 95% CI: 0.52, 0.86) and ulcerative colitis (pooled OR: 0.77; 95% CI: 0.61, 0.96). Furthermore, a later meta-analysis of 7 case-control studies suggested a 31% decrease in the risk of inflammatory bowel disease among breastfed children (Barclay *et al.*, 2009). Nevertheless, the effect was found to be only modest when ulcerative colitis and Crohn's disease were investigated separately (Barclay *et al.*, 2009).

Breastfeeding against Childhood Cancers

Breastfeeding has been associated with a reduced risk for childhood leukemia and other childhood cancers (Ip *et al.* 2007; Riordan and Wambach, 2010). The protective effect of breastfeeding has been attributed to HAMLET (Riordan and Wambach, 2010); a component formed by α -lactalbumin in the presence of free oleic acid (Newburg and

Walker, 2007). It is a protein-lipid complex that causes apoptosis to tumors (Riordan and Wambach, 2010; Newburg and Walker, 2007) while does not affect fully differentiated cells (Riordan and Wambach, 2010).

The relationship of Breastfeeding and Obesity

The relationship between breastfeeding and obesity has been thoroughly investigated. Even though, evidence is controversial with regards of the protective effect of breastfeeding on obesity in early life (Ryan, 2007; Marseglia *et al.*, 2015), meta-analyses suggested a modest protective long-term effect of breastfeeding on obesity. Horta and Victora (2013) in an updated version of a meta-analysis for the WHO, reported a small but statistically significant decrease of the risk of obesity by 15% (OR: 0.85, 95% CI: 0.80, 0.91). The finding was also confirmed by a more recent meta-analysis (Yan *et al.*, 2014). Further, a dose-response effect of breastfeeding was observed suggesting that the longer the duration of breastfeeding, and even more so the exclusivity, the stronger the effect of breastfeeding on obesity prevention (Harder *et al.*, 2005; Marseglia *et al.*, 2015). A meta-analysis by Harder and colleagues (2005) suggested a 4% decrease of the risk of obesity for each additional month when compared with exclusively formula fed infants. Infants who breastfed for longer than four months had a smaller weight gain at the age of three in comparison with those that breastfed for less than four months (Griffiths *et al.*, 2009).

Many physiological mechanisms as well as behavioral factors have been suggested to elucidate the preventative role of breastfeeding on the development of childhood obesity and how its effect might persist in adulthood. Breastfeeding is implicated with appetite and hormonal regulation (Bartok and Ventura, 2009; Stolzer, 2011) that have been associated with obesity and overweight in later life (Stolzer, 2011). Breast-fed infants develop the ability to regulate the volume and the frequency of breast milk consumption depending on alterations of energy density during lactation (Bartok and Ventura, 2009). Of course, it has been suggested that self-regulation requires some time until it is established and it does not occur in all infants (Bartok and Ventura, 2009). On the other hand, formula feeding is more likely to be associated with parental control on the procedure and the outcome of each feeding (Oddy, 2012).

Increased protein intake has been associated with higher insulin and IGF-1 secretion levels (Stolzer, 2011; Marseglia *et al.*, 2015). Increased IGF-1 levels promote adipocyte

overproduction and differentiation during infancy (Marseglia *et al.*, 2015; Oddy, 2012), whereas lower protein levels result to induced IGF-1 expression, that delays growth (Oddy, 2012). This mechanism is supported by the *early protein hypothesis*. This suggests that the protein content in formula that is about 55-80% higher than the breastmilk (Koletzko, 2006) induces the mechanism of higher insulin and IGF-1 levels which in their turn lead to increased early adiposity and fat deposition as well as rapid growth during infancy associated with obesity in later life (Oddy, 2012). Higher protein levels might reduce human growth hormone (HGH) which might slow down lipolysis (Koletzko, 2006; Oddy, 2012).

In contrast to breastfeeding, formula-feeding has been associated with rapid growth during infancy (Singhal and Lanigan, 2007). According to the *growth acceleration hypothesis*, accelerated growth may participate in the programming of obesity in later life as well as other risk factors of the metabolic syndrome is initiated by weight gain in early years (Singhal and Lanigan, 2007; Oddy, 2012).

Finally, breast milk contains a number of hormones that have been implicated in the development of obesity, including leptin, adiponectin, ghrelin, resistin. These hormones have been found to contribute to the metabolic programming through appetite regulation and energy balance as well as fat and lean body mass development (Marseglia *et al.*, 2015).

Breastfeeding against Cholesterol

Evidence on the effect of breastfeeding on total cholesterol levels is not clear. Some studies suggest a potential protective effect, which is more evident for exclusive breastfeeding (Ip *et al.*, 2007), while others do not report similar effects (B.L. Horta and Victora, 2013; Horta, Loret De Mola and Victora, 2015). The high concentrations of cholesterol in the breast milk during infancy has been implicated with lower cholesterol levels in later life, through the down-regulation of the enzyme HMG-CoA, resulting to the reduction of cholesterol synthesis (B.L. Horta and Victora, 2013; Kelishadi and Farajian, 2014).

Breastfeeding against Blood Pressure

Breastfeeding was associated with lower systolic but not diastolic blood pressure in adulthood (Martin, Gunnell and Smith, 2005; Chung *et al.*, 2007; B.L. Horta and Victora, 2013). Specifically, mean systolic blood pressure was 0.80 mmHg lower (95% CI: -1.17, -0.43) in adults that breastfed during infancy in comparison to those that did not (B.L. Horta and Victora, 2013). Breastfeeding contributes to the regulation of blood pressure through the low intake of sodium and the high intake of long-chain PUFA, structural components of vascular endothelium (Martin, Gunnell and Smith, 2005; Agostoni *et al.*, 2009).

Cognitive and Psychological Effects of Breastfeeding

A meta-analysis of 20 controlled studies suggested of higher scores of cognitive development among breastfed infants in comparison with formula fed. Specifically, there was an increase in the cognitive development by 3.2 points among breastfed infants than formula fed. When the association of BF was examined in relation with birth weight, breastfed low birth weight infants were more benefited than normal weight infants. They presented an advantage of a cognitive development of 3.16 points than formula fed, whereas normal weight infants had an advantage of only 2.89 points than formula fed (Anderson, Johnstone and Remley, 1999). A more recent meta-analysis by Horta & Victora (2013) confirmed the advantage in cognitive development among breastfed infants with additional of 3.5 points. When maternal intelligence was taken into account, the effect of BF was declined and was associated with additional 2.19 points.

1.2.2 Benefits of Breastfeeding to the mother

Evidence also indicates a plethora of protective health effects for mothers, including a reduced risk of ovarian and premenopausal breast cancer, postnatal depression as well as type 2 diabetes and obesity. This evidence has been extensively reviewed (Ip *et al.*, 2007; Chowdhury *et al.*, 2015; Wang, Li and Shi, 2015) while more maternal health outcomes are being investigated (for example, the potential protective effect of breastfeeding on rheumatoid arthritis (Chen *et al.*, 2015) or urinary tract and other infections (Mårild *et al.* 2004; Labbok, 2001) or on reducing the severity of anemia (Labbok, 2001)

1.2.2.1 Short-term Effects of Breastfeeding

Lactational Amenorrhea

Breastfeeding has been associated with longer lactational amenorrhea. Exclusive or predominant breastfeeding increases the duration of lactational amenorrhea by 23% in comparison with no breastfeeding and by 21% compared to partial breastfeeding (Chowdhury *et al.*, 2015).

Breastfeeding and postnatal depression

Findings in relation with the effect of breastfeeding on postpartum depression are unclear (Robertson, Grace and Wallington, 2004). A recent study based on the Avon Longitudinal Survey of Parents and Children (ALSPAC) suggested the effect of BF on postpartum depression is determined by the presence of depression during pregnancy and maternal intention to BF. Among mothers that had no symptoms of depression during pregnancy, BF was associated with reduced risk of postpartum depression for those that had intended to BF but it was found to increase the risk postpartum depression among those that had not intended to BF (Borra, Iacovou and Sevilla, 2015). Another study performing secondary data analysis from the Infant Feeding Practices Study II, suggested that unpleasant early BF experiences might increase the risk of post partum depression at 2 months after birth (Watkins *et al.*, 2011). The adjusted OR of postpartum depression was 1.96 (95% CI 1.17–3.29), 2.13 (95% CI 0.74–6.15) and 2.24 (95% CI 1.18–4.26) among mothers that experienced severe BF pain at first day, at first and second week in

comparison to those that experienced no pain (Watkins *et al.*, 2011). On the other hand, postnatal depression was identified as a predictor of duration and exclusivity of breastfeeding. It has been suggested that postnatal depression is associated with shorter duration and exclusivity of breastfeeding (Chowdhury *et al.*, 2015; Dias and Figueiredo, 2015).

1.2.2.2 Long-term Effects of Breastfeeding

Breastfeeding against Breast and other Reproductive Cancers

Many epidemiological studies have suggested an inverse relationship between breastfeeding and breast cancer for both pre- and postmenopausal women (Enger *et al.*, 1998; Tryggvadóttir, 2001; Zheng *et al.*, 2001; Ip *et al.*, 2007). A recent systematic review and meta-analysis of nearly 100 estimates for the association between breastfeeding and breast carcinoma suggested a statistically significant reduction in risk among mothers who breastfed. In fact, longer duration of breastfeeding has been associated with a lower risk of breast cancer, with a reduction of about 23% (OR 0.77, 95% CI 0.72–0.83) among women who breastfed for longer than 12 months, even if the analysis is restricted to higher-quality studies (Chowdhury *et al.*, 2015). Breastfeeding has also been associated with a reduced risk of endometrial (Wang, Li and Shi, 2015) and ovarian cancer (Ip *et al.*, 2007). A more recent meta-analysis identified a linear dose-response between breastfeeding and endometrial cancer with a reduction in the relative risk of about 2% for every month of breastfeeding (Wang, Li and Shi, 2015).

Breastfeeding against maternal obesity

Evidence has consistently shown that high pre-pregnancy weight is associated with adverse effects on pregnancy and breastfeeding outcomes. Obese women present lower breastfeeding initiation rates and higher premature discontinuation rates (Donath and Amir, 2008). Potential explanations of this observation have been attributed to physiological, socio-cultural, psychological as well as medical causes (Donath and Amir, 2008). On the other hand, a meta-analysis which included all prospective studies, five in total, suggested that the effect of breastfeeding on post-partum weight change was unclear (Ip *et al.*, 2007; Chowdhury *et al.*, 2015). Other factors such as socio-economic status,

ethnicity, gestational weight gain (GWG) and total energy intake might have greater effect than breastfeeding (Ip *et al.* 2007).

Breastfeeding against Diabetes

Breastfeeding has been associated with improved insulin sensitivity and lipid metabolism in women with gestational diabetes (Ip *et al.* 2007) and thus having lower risk of postpartum diabetes (Binns, Lee and Low, 2016). However, lactation might not have a beneficial effect on mothers with a history of gestational diabetes later on the development of type 2 diabetes, in comparison with mothers without a history (Ip *et al.* 2007).

Breastfeeding against Osteoporosis

Available studies examining the association of breastfeeding with osteoporosis are very limited and evidence is inconsistent (Chowdhury *et al.*, 2015).

1.3 Conclusion

Numerous health benefits and advantages have been associated with breastfeeding in infancy that which persist in later life up to adulthood. There is convincing evidence of the protective effects of breastfeeding against infectious diseases in the gastrointestinal tract and the respiratory system. The effects of breastfeeding on gastrointestinal diseases appear to be even higher in exclusively breastfed infants, reducing mortality and hospital admissions by 80-90% for mortality and hospital admissions and morbidity by 50% for morbidity (Horta and Victora, 2013). According to Horta and Victora (2013) “*the protection afforded by breastfeeding against diarrhea is certainly one of the most consistent findings in the epidemiological literature on any type of outcome*”. Similar were their conclusion in terms of findings on the protective effect of breastfeeding on respiratory diseases, to quote: “*These results are robust, being observed in high and low-income settings, across different respiratory infections related outcomes, and evident in studies using different definitions of breastfeeding categories*” (Horta and Victora, 2013).

Several longer-term consequences of breastfeeding were extensively studied, where as others have not been studied in similar depth. There is some evidence to suggest that breastfeeding is protective against asthma in childhood and adolescence. However, evidence on the protective effect of breastfeeding for eczema and allergic rhinitis is weaker (Longde, 2015). Evidence suggests of a causal relationship between breastfeeding and intelligence performance, even though the effect appears to be modest (Horta and Victora, 2013). However, evidence on the protective effect of breastfeeding for eczema and allergic rhinitis is weaker (Longde, 2015). Breastfeeding might also have a protective effect on obesity. However, the effect was small “*without ruling out the effect of residual confounding as in most study settings breastfeeding duration was higher among mothers of higher educational attainment and higher income*” (Horta and Victora, 2013). Even though, breastfeeding might have a beneficial effect on diabetes, to quote: “*more studies are needed to confirm this outcome*” (Horta and Victora, 2013). In relation with blood pressure, breastfeeding appears to have a small effect, if any, while no protection was found on cholesterol. Evidence on the association of breastfeeding with inflammatory bowel disease appears to be inconclusive (Mikhailov and Furner, 2009)

Breastfeeding has also been reported to have immediate or long-term beneficial advantages effects on maternal health. There is sufficient evidence suggesting to suggest

of the protective effect of breastfeeding on breast and ovarian carcinoma, as well as type 2 diabetes. Only exclusive and predominant breastfeeding was associated with prolonged amenorrhoea. No clear association has been observed between breastfeeding and mineral density, maternal depression or postpartum weight change (Chowdhury *et al.*, 2015).

Chapter 2:

Breastfeeding Recommendations and Targets

During the 1970s, concern has been expressed with regards to the very low breastfeeding rates globally, which has led to the inauguration of a series of policies and strategies to protect, support and promote breastfeeding and, thus, to tackle any further reduction in global breastfeeding rates. Some of the major historical milestones with regards to efforts of international organizations such as the WHO and UNICEF to tackle the low breastfeeding rates include a number of related international initiatives, which will be presented in the sections to follow. **Table 2.2** presents these milestones, along with their aim and main recommended strategies.

2.1 International and other initiatives

2.1.1 The International Code of Marketing of Breastmilk Substitutes

In 1981, a WHO and UNICEF collaboration resulted in the development of “The International Code of Marketing of Breastmilk Substitutes” (ICMBS). This declaration mainly aimed to safeguard and establish breastfeeding as the optimal infant feeding practice. It suggested the use of breastmilk substitutes only when these are necessary, under the appropriate conditions and with the provision of sufficient information through a set of recommendations on how the marketing of breastfeeding substitutes should be regulated (WHO, 1981).

Table 2.1 describes the main strategies adopted by the ICMBS. In brief, the ICMBS states that : (1) no advertising or any other form promotion of breastfeeding substitutes¹ should be promoted in the public, (2) no free samples should be promoted to the mother, family or health care professionals, (3) any type of promotion of breast-milk substitutes, bottles or nipples in health care services and facilities should be prohibited, (4) any gifts or samples to health care professionals should should be prohibited, (5) educational material that promotes the benefits and superiority of breastfeeding (e.g. economic benefits, health

¹According to the ICMBS, breastfeeding substitutes include food and beverages such as infant formula, other milk products, cereals for infants vegetable mixes, baby teas and juices, follow-up milks, feeding bottles and teats.

hazards associated with formula feeding) and instructions for the safe use of artificial feeding should be developed and promoted to the public and (6) benefits and superiority of breast milk should be stated on the product labels (WHO, 1981). However, a WHO/UNICEF report published three and half decades after the introduction of the International Baby Food Action Network (IBFAN) entitled “*Marketing of breast-milk substitutes: National implementation of the International Code – Status report 2016*” (WHO/UNICEF, 2016) pointed out that only 39 (with a slight increase from 37 in 2011) of a total of 194 countries adopted all the provisions of the International Code through the implementation of legal measures. The majority of the participating WHO members, 135 out of the 194 WHO Member States (69.6%) adopted some form of the Code provisions. While this number significantly increased from 103 at the year of the previous status report (WHO, 2013), in 2016, 49 countries reported no measures, to support the Code and a further 10 countries provided no relevant information.

In the most recent status report, the highest proportion of the WHO Member countries that adopted legal measure to incorporate the Code provisions come from the South East Asia (36% of member states). The European Region ranks last with only 6% of members states adopting full legislative provisions of the Code (specifically, only Albania, Georgia, Armenia), followed by the Western Pacific and the Americas Region with 15% and 23%, respectively (WHO, UNICEF, 2016). The key legislative provisions of the Code include (1) the explicitly covering of products or children over 1 year, (2) covering of complimentary foods, (3) informational and educational material that should include at least five necessary messages, (4) prohibition of avdertising, (5) prohibition of samples and gifts, (6) prohibition of contact with pregnant women, (7) prohibition of free/low cost supplies to health facilities, (8) prohibition of gifts to health workers, (9) nutrition and health claims on labels, (10) no pictures idealizing infant formula on labels.

Table 2.1 shows the distribution of the countries in the six WHO regions according to their legislation status on the Code.

Table 2.1: *Distribution of WHO Member Countries based on the legislation status of the Code*

<i>Law Categories</i>	<i>African</i>	<i>Americas</i>	<i>Eastern Mediterranean</i>	<i>European</i>	<i>South-East Asia</i>	<i>Western Pacific</i>	<i>Total</i>
Full provisions	14	8	6	3	4	4	39
Many Provisions	11	5	6	4	3	2	31
Few provisions	5	8	6	41	-	5	65
No measures	15	14	3	1	4	12	49
No Information	2	-	-	4	-	4	10
Total	47	35	21	53	11	27	194

Source: Marketing of breast-milk substitutes: National implementation of the International Code – Status report (2016)

In the status report, both Cyprus and Greece were included in the category of “few provisions” based on the legislation status of the Code. In both countries, measures enacted were limited to: (a) information on labels of breast-milk substitutes, and specifically to the banning of pictures that idealize formula feeding and the nutrition and health claims and (b) the publication of educational material from the Ministry of Health for Cyprus referring to the benefits of BF, practical advice to achieve successful BF, the 10 Steps of Breastfeeding etc (https://www.moh.gov.cy/moh/moh.nsf/page78_gr/page78_gr?OpenDocument) and from La Leche League (LLL) Greece (<http://www.lllgreece.org/enemerotiko-yliko>) for the ICBMS, the importance of BF, myths around BF ect. According to the report the only designated products considered under the scope of the Code were breast-milk substitutes which among others include infant formula, complimentary foods, follow-up formula, feeding bottles, teats and/or pacifiers.

The Resolution World Health Assembly WHA49.15 of 1996 suggested that monitoring of the implementation of ICBS is required that should be conducted in a transparent,

independent manner and free of influence from the marketing companies. For the assessment of the quality of the formal monitoring mechanisms and the comparability of the data at a national and international level, all member countries should meet the following criteria: 1. Budgeted/ funded, 2. Sustainable, 3. Empowered to take action, 4. Free from commercial influence, 5. Independence and 6. Transparency in the way the Code is carried out. Cyprus is among the 32 countries with formal mechanisms of monitoring and enforcement of the implementation of the Code that meet all the criteria for operationalizing, even though it has not yet implemented all the required provisions for the ICBS mentioned above. On the other hand, Greece lacks on the budgeting and sustainability criteria (WHO, UNICEF, 2016). Only 17% and 38% of the countries with formal monitoring mechanism meet the two criteria of donated budget and sustainability, in comparison with the other criteria that range from 81% -88% (WHO, UNICEF, 2016).

2.1.2 The Innocenti Declaration and Baby Friendly Hospital Initiative

In 1990, “*The Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding*” was developed in a meeting on “Breastfeeding on the 1990s: A Global Initiative”, held with the participation the WHO/UNICEF policymakers from 30 countries. This declaration set an agenda with operational targets to be adopted at a national and international level within the next five years (WHO, 1990). One year later, in 1991, the “*Baby Friendly Hospital Initiative*” (BFHI), was launched as a result of the WHO/UNICEF collaboration with an agenda of operational targets aiming at the protection, promotion and support of Breastfeeding through the implementation of breastfeeding promoting maternity services, widely known as “*Ten Steps to Successful Breastfeeding*” (WHO, 1992), or simply as the “*Ten Steps*”. They constitute the cornerstone of the BFHI and are used as an educational tool for health care professionals. They are a set of good maternity practices that have been associated with direct increase of BF Initiation, duration and exclusivity, the development and establishment of policies within the facilities that provide maternity services and the national strategies in order improve breastfeeding practices, promote exclusive breastfeeding and implement the principles of the International Code (UNICEF, 2006). The 10 Steps are as follow (1) have a written policy that is communicated to all health professionals, (2) Train all health professionals to implement the policy, (3) inform the mothers about the benefits of

breastfeeding, (4) initiate BF within one hour after birth, (5) support mothers to initiate BF, (6) give to the infant nothing but breast milk (7) practice rooming-in, (8) Encourage BF on demand, (9) use on artificial teats or pacifier, (10) support after discharge. This topic will be analysed further in **Chapter 4** since the description of the level of the 10 Steps across maternity clinics Cyprus was one of the main aims of this thesis.

A conceptual framework was developed to describe Innocenti Declaration in relation with the three levels of activity that would facilitate the efforts towards its full establishment (UNICEF, 2006). The first level includes the **protection** of breastfeeding mothers from obstacles that would discourage them to continue breastfeeding. This is followed by the **promotion** of breastfeeding through activities to influence maternal decision towards breastfeeding. The third level involves the **support** of mothers by trained health professionals by providing assistance to overcome problems and conditions that might jeopardize breastfeeding practice (UNICEF, 2006). Thus, the Innocenti Declaration aimed to provide the optimal conditions through promotion, protection and support for all mothers to make the ultimate decision for their infant. The Innocenti Declaration was endorsed as component of the Global Strategy for Infant and Young Child Feeding in 2002 that called the governments for action in order to enact the four fundamental targets as well as the additional five targets that aimed to maternal support, complementary feeding, and community action (UNICEF, 2006).

The main achievement with regards to the Innocenti Declaration was the fact that breastfeeding was recognized as every child's human right to the "*highest attainable standard of health*". Hence, recognizing breastfeeding as the optimal infant nourishment for health (UNICEF, 2006), it redefined breastfeeding as a human rights issue, and hence a political issue of high priority that encompasses a number of difficulties and concerns within a multidimensional perspective (Kent, 2006).

In terms of the observed impact, an increase in exclusive breastfeeding had been observed within the first fifteen years of the declaration, at least in developing countries, and especially in those countries where women received appropriate support and counselling from trained health care professionals. According to UNICEF, 38 countries achieved the first target of the Innocenti Declaration by establishing a national committee and appointing a national breastfeeding coordinator (UNICEF, 2006). Cyprus has established a National Committee in 2012. The Committee published the National Breastfeeding Strategy in 2011, followed by the National Policy in 2015.

2.1.2 Other initiatives

2.1.2.1 Global Strategy for infant and young child feeding

The Global Strategy for Infant and Young Child Feeding aimed to enhance the efforts to promote, protect and support infant and child feeding, built up on previous initiatives, emphasizing on the Innocenti Declaration, the International Code of Marketing of Breast Milk Substitutes and the Baby-Friendly Hospital Initiative. It further focuses on the nutritional needs of infants living in difficult circumstances and require special attention for example infants of mothers with HIV, low-birth weight infants and infants in emergency situations. To achieve optimal infant and child feeding, the Global Strategy emphasizes on (1) the commitment of governments to develop a policy that promotes infant and child feeding with the context national policies, (2) maternal access to skilled support that will enable them to initiate and continue EBF for the first six months of life, and thereafter ensure timely introduction of adequate and safe complementary feeding, (3) empowerment of health care professionals to provide effective counseling, (4) the implementation of the International Code of Marketing of Breast Milk Substitutes and if needed the legislation of additional measures, (5) the enactment of legislation in relation with the protection of the rights of working mothers on breastfeeding (WHO, 2002).

2.1.2.2 Breastfeeding Advocacy Initiative

Most recently, in order to raise awareness on current infant feeding practices worldwide and further support breastfeeding, the joint WHO/UNICEF “Breastfeeding Advocacy Initiative” developed a strategic framework to enhance global, regional and national stakeholder advocacy for breastfeeding by setting breastfeeding interventions and programs as priority by ensuring the political and stakeholders commitment for financial and social support. The agenda of the advocacy initiative involved of three strategic goals that aimed to achieve or exceed the 2025 World Health Assembly Target of exclusive breastfeeding rates of at least 50% at six months (WHO 2015)

Table 2.2: WHO International and National Initiatives and Policies for the protection, promotion and support of Breastfeeding

Year	Initiative/ Policy	Aims	Recommended practices/ strategies
1981 ¹	International Code of Marketing of Breast Substitutes	To ensure and support the provision of safe and adequate infant nutrition through the promotion, protection and support of breastfeeding. To ensure suitable use of human milk substitutes only when necessary based on to the provision of appropriate and comprehensive information	• Information about artificial feeding provided to the health professionals should be scientific and factual • No words or pictures promoting artificial feeding as the ideal form of infant feeding e.g. pictures of infants on the labels of the products • No advertising or other form of promotion of artificial feeding products to the public within the Scope of the Code • No free samples to mothers, families and health workers • No gifts or free samples to health care professionals • No promotion of products in health care facilities • No advice on breastfeeding should be provided by company mother craft nurses • Products unsuitable for infants should not be promoted e.g. sweetened condensed milk
1990 ²	Innocenti Declaration on the protection, promotion and support of breastfeeding	To protect, promote and support breastfeeding	The operational targets suggested that all governments should have: • Appointed a national breastfeeding coordinator and establish a multisectoral national breastfeeding committee • Ensured that every facility providing maternity services fully practices all Ten Step to Successful Breastfeeding • Take action to give effect to the principles and aim of the International Code of Marketing of Breastfeeding Substitutes • Enacted imaginative legislation protecting the breastfeeding rights of working women
1991 ³	The Baby Friendly Initiative	To support early initiation of breastfeeding	The Ten Steps to Successful Breastfeeding should be implemented in every facility that provides maternity services and care for newborn infants

Year	Initiative/ Policy	Aims	Recommended practices/ strategies
2001 ⁴	Global Strategy for Infant and Young Child feeding	To ensure every child ‘s right to the highest attainable standard of health by achieving an optimal nutritional status and improving infant and child growth and development through the protection and promotion of optimal infant feeding practices. This can be achieved by: • raising awareness of infant and child feeding issues, identifying approaches and providing interventions • Assuring commitment at national and international level for achieving optimal feeding practices • Creating a supportive environment to mothers, families and other caregivers with informed choices about optimal infant and child feeding practices	• Exclusive Breastfeeding as the optimal feeding practice through the implementation of breastfeeding promoting practices such as BFHI, providing accurate and comprehensive information • Breastfeeding support, education and technical assistance provided by skilled health care professionals and lay people to help mothers to overcome potential BF problems and improve their self-confidence with regards of BF- workplace support and facilities should be provided to working mothers. • Adequate, timely and safe and properly provided complementary feeding is recommended to ensure that infant nutritional requirements are met- accurate, consistent and comprehensive information and skilled support on complementary feeding necessary • Suitable information and knowledge should be provided for industrially processed complementary feeding through appropriate marketing. • Confirm the need for the application of the operational goals; enforce the involvement of the government and other relevant parties- development of a national policy for promotion, protection and support of optimal infant and child feeding practices • Provide support and counseling to HIV-infected mothers on the different infant practices; discuss risks and benefits of each practice and provide help on choosing the most appropriate one for each mother
2015 ⁵	Breastfeeding Advocacy Initiative For the best start in life	• To promote the adoption supportive legal instruments and policies to meet or exceed the WHA global target of EBF to at least 50% by 2025	The Breastfeeding Advocacy Initiative included the following three strategic goals • “Foster leadership and alliances and effectively integrate and communicate breastfeeding messages” • “Mobilize resources and promote accountability”

Year	Initiative/ Policy	Aims	Recommended practices/ strategies
		To galvanize political, financial and social support to scale up breastfeeding programmes and to encourage	Build knowledge and evidence to enhance breastfeeding policies, programmes, financing and communication”

Sources: ¹WHO (1981) International Code of Marketing of Breast-milk Substitutes; ²WHO (1990) Innocenti Declaration on the protection, promotion and support of breastfeeding; ³WHO (1991) The Baby Friendly Initiative; ⁴WHO (2003) Global Strategy for infant and young child feeding; ⁵WHO (2015) Breastfeeding Advocacy Initiative For the best start in life

2.2 Recommendations and Targets

2.2.1 BF Recommendations

Originally, the WHO recommended exclusive breastfeeding between four to six months with continuation of breastfeeding along with complimentary infant feeding up to two years or more. In 2001, a systematic review commissioned by the WHO, after comparing infant and maternal outcomes of exclusive breastfeeding for four to six versus six months, suggested that the optimal duration of exclusive breastfeeding should be six months (Kramer and Kamura, 2002). Therefore, the WHO breastfeeding recommendations were modified accordingly by increasing the recommended duration of exclusive breastfeeding to exactly six months. This decision was further justified following a series of updated versions of the systematic review that were conducted in the following years (Kramer and Kamura, 2004; 2009; 2012), which also confirmed the additional beneficial effects of exclusive breastfeeding for six months for both the infant and the mother. Currently, the WHO recommendations for exclusive breastfeeding for the first six months have been adopted by all relevant international and national organizations. Some of these organizations such as the American Academy of Pediatrics (Eidelman *et al.*, 2012) recommend a shorter duration of complementary breastfeeding of up to the first year of life (rather than two as in the case of the WHO). More recently, the ESPEGAN Committee on Nutrition (Agostoni *et al.* 2009) recommended EBF or full BF for six months with complimentary feeding being introduced no sooner than the 17th week and no later than the 26th week.

2.2.2 BF Targets

2.2.2.1 WHO Global Nutrition Target 2025

In 2012, the World Health Assembly endorsed an action plan, the “*Comprehensive implementation plan on maternal, infant and young child nutrition*” that aimed to achieve the six global targets on maternal, infant and young child nutrition by 2025 (WHO, 2014). The fifth target focuses on the increase of the proportion of infants aged 0-6 months exclusive breastfeeding worldwide to at least 50% by the year 2025.

2.2.2.2 Healthy People 2020

Healthy People 2020 is the fifth of a series of Initiatives in the US that was first launched with the publication of *Healthy People: the Surgeon General's Report of Health Promotion and Disease Prevention*. It presents specific quantitative goals and setting objectives that aimed to reduce prevalence of mortality and morbidity in the US by the year 2020. It currently includes as many as 1200 targets, including the aim to increase BF and EBF up to the first year of life. Specifically, the Healthy People 2020 target is set to an increase of breastfeeding prevalence to 60.6% at six months by the year of 2020 from 43.5% in 2006. Similarly, the target for EBF was set for 25.5% through the first six months from 14.1% in 2006 (<https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives>).

Chapter 3:

Breastfeeding initiation, exclusivity, duration and determinants

This Chapter discusses the development of breastfeeding definitions and indicators (**Section 3.1**) and the methodological issues raised with the estimation of breastfeeding indicators (**Section 3.2**). It further provides a brief history of BF trends (**Section 3.3**) and the most recent international evidence in terms of breastfeeding status (**Section 3.4**). The current chapter presents existing data on BF and EBF in Greece and Cyprus and it concludes with a discussion on the determinants of BF as defined by the socio-ecological model (**Section 3.5**).

3.1 Breastfeeding Definitions and Indicators

3.1.1 Development of Breastfeeding Definitions and Indicators

After the series of international initiatives and declarations, the international consensus on the protection, promotion and support of breastfeeding has created the need for consistency in terms of defining the different levels of breastfeeding behavior and for the standardization of the methodology used for measuring breastfeeding behaviors. This was important in order to facilitate the interpretation of data and to ensure accurate inferences. Thus, it has led to the development of reliable, valid and consistent breastfeeding indicators which aimed to enable the comparison of national and international breastfeeding as well as to develop a common monitoring system for breastfeeding rates (Labbok and Krasovec, 1990; WHO, 1991; Webb *et al.*, 2001; WHO, 2008).

In 1990, the *Interagency Group for Action on Breastfeeding* (IGAB) published a set of breastfeeding definitions for the first time (Labbok and Krasovec, 1990) which described the different types of breastfeeding behaviours and provided more detailed information on breastfeeding practices (Labbok and Krasovec, 1990; Webb *et al.*, 2001). The schema by Labbok and Krasovec (1990) differentiated “Full” and “Partial” breastfeeding categories. “Full” breastfeeding was further subdivided into “Exclusive” and “Almost Exclusive” Breastfeeding. The main difference between the two categories is that an exclusively breastfed (BF) infant strictly receives nothing but breastmilk, whereas in the second category consumption of water and other liquids, but no formula, is sporadically allowed. No further clarifications with regards of the

volume and/ or the frequency of the liquids were provided. On the other hand, further details were provided with regards of the three levels suggested for defining partial BF into “High”, “Medium” and “Low” on the basis of the proportion of BF feeds to the total feeds. The categorization of partial breastfeeding was developed to reflect the existing evidence on the dose-response relationship between fluid and other complementary food intake, other than breastmilk, and the risk of infant mortality and morbidity (Labbok and Krasovec, 1990). Finally, “Token” breastfeeding was used to describe the infant feeding practices when breastfeeding is mainly used for infant comfort and soothing at irregular intervals rather than for nutritive and other purposes (Labbok and Krasovec, 1990; Webb *et al.*, 2001).

The following year, the WHO convened a meeting to reach a consensus on the methodological issues that had risen on assessing breastfeeding, including the key definitions of breastfeeding indicators (i.e. variables that measure the associated distinctively defined BF practice) and the methodology of BF measurement (WHO, 1991). The WHO (1991) suggested on the conduct of a household survey for collecting information on current infant feeding practices with the recruitment of all living infants aged 24 months or less. In general, BF indicators adopted by the WHO (1991) were similar to those described in the Schema as indicated by IGAB (Labbok and Krasovec, 1990; WHO, 1991). However, a number of modifications were observed in the terminology and the definitions used to describe breastfeeding indicators that aimed to suggest an improvement on the gaps identified on the IGAB breastfeeding definitions (WHO, 1991; Webb *et al.*, 2001). WHO considered that the term “predominant” would be more suitable and would cause less confusion than the term “almost exclusive”. It further suggested of the inclusion of suryps or drops (e.g. vitamins, minerals, medication) in the category of “exclusive breastfeeding” as they can not be used as breast milk substitutes but only for medical reasons. The term “partial” Breastfeeding that was further sub-classified to “high”, “medium” and “low” was not adopted by WHO. On the contrary, it was replaced by the term “breastfeeding” simplifying the procedure of data collection. Therefore, an infant was considered to breastfeeding if not “exclusively” or “predominantly” breastfeeding. WHO also developed an additional indicator, not considered in Labbok and Krasovec schema (1990), “complimentary feeding “ to be used if an infant consumes any solid or semi-solid or artificial milk in addition to breast milk (WHO, 1991; Webb, 2001). **Table 3.1** outlines the definitions of BF Practices as suggested by the WHO.

Table 3.1: WHO definitions of Breastfeeding Practices

	BF status	Not Allowed	Allowed
¥Exclusive Breastfeeding	Only Breastmilk given from any source including wet nurse or in expressed form	Other liquids or solids	Vitamin or mineral-contained drops and syrups Medicines, Oral Rehydration Salts (ORS)
¥Predominant Breastfeeding	Breastmilk as the primary source of nourishment		Vitamin or mineral drops and syrups Water and other water-based liquids (tea, infusions sweetened water etc) fruit juice
Breastfeeding	Breastmilk provided	None	All
Bottle-feeding	No BM provided	None	
Ever Breastfed	Received Breast milk at least once		
Complementary feeding	Breastmilk given		Liquids including non-human milk and formula; Solid/ semi-solid food given

¥Full Breastfeeding composed of both EBF and Predominant BF; Sources: WHO (1991) Indicators for assessing Breastfeeding Practices; WHO (2008) Indicators for assessing infant and young child feeding practices: Part 1 Definitions

When the WHO recommendations on EBF duration were modified from four months to six months of life, this resulted in the necessity for revising the BF indicators that would reflect the updated guidelines, including the change of timing of introduction of complementary feeding. In 2002, the WHO initiated a procedure of reviewing and revising the set of BF indicators in order to include indicators on providing additional information on complementary feeding that did not receive the appropriate consideration in the previous report. In addition to assessing the timing of introducing of complementary feeding, quantity and quality of complimentary feeding practices were also considered in the updated set of indicators. Using as reference the *Guiding Principles for Complimentary Feeding of the breastfeed child*, which focused on complementary feeding

practices for non-breastfed infants aged 6-23 month and was guided by the recommendations and targets set by the *Global Strategy for Infant and Young Child Feeding*, the WHO conducted a series of activities that aimed to developing the definition and validation of the indicators on complementary feeding. On the basis of the findings, a revised set of indicators was suggested. In the meeting convened in 2007, the participants reached a consensus with a new set indicators composed of eight core indicators and seven optional indicators for assessing infant and child feeding practices (WHO, 2008).

The proposed methodology for data collection to measure BF was once more a population-based survey and information on BF status was based on the previous 24hrs (“current status”), with the exception of core indicator “*Early BF Initiation*” and the optional indicator “*Children ever breastfed*” which were based only on retrospective data on children younger than two years. Exclusive Breastfeeding was based on the proportion of children aged 0-5 months that breastfed the last 24 hours. Usually, exclusive breastfeeding is ceased during the period 5-5.99 with the gradual introduction of complementary feeding. For example, if solid foods are introduced during 5-5.99 months, the infant ceases to be exclusively breastfed. However, if only breast milk was consumed the last 24 hours, the babies will be misclassified as EBF, leading to an overestimation of EBF. On the contrary, most infants discontinue EBF few days before the six month as a result EBF might be lower than looking for EBF babies 5-5.99 months of age (Greiner, 2014). To evaluate infant feeding practices beyond six months the following indicators were suggested: (1) Introduction of Solid, semi-solid and liquid foods between 6-8 months (the proportion of infants aged 6-8 that received solids, semi-solids or soft food in addition with breastfeeding the previous 24 hours) and (2) Continued Breastfeeding at first year (the proportion of infants that continue breastfeeding at the age of 12-15 months). The latter indicator, however, was criticized in relation with the period decided for its measurement since it might underestimate the proportion of BF infants at first year but discontinue afterwards. Further, indicators assessing the composition and quantity of infant and young children feeding were developed such as (1) minimum dietary diversity (i.e. consumption of at least four from the seven food groups²), (2) minimum meal

² For the purposes of the calculation of minimum diet indicator as discribed on Table 3.3, foods were divided into seven groups. These groups are: 1. grains, roots, tubers; 2. Legumes and nuts; 3. Dairy products-milk, yogurt, cheese-; 4. flesh foods-meat, fish, poultry, liver/organ meats; 5. Egg; 6. Vitamin A rich fruits and vegetables; 7. Other fruits

frequency (Proportion of breast fed and non breastfed children 6-23 months of age who consume the min number of meals of solid, semi-solid, or soft foods (including milk feeds for non-breastfed children³), (3) minimum acceptable diet which was based on the previous indicators, (4) Minimum dietary diversity and minimum meal frequency (the proportion of infants that consume at least four groups of food and the minimum number of meals), and (5) consumption of iron fortified and iron-rich foods (proportion of children 6-23 months of age that consume iron-rich or iron-fortified foods).

Most Breastfeeding indicators developed to measure the proportion of infants that follow the different breastfeeding practices were suggested as optional by the WHO, including Predominant BF under six months (the proportion of infants aged 0-5 that predominately breastfeed), bottle feeding (proportion of bottle fed infants aged 0-23) and age-appropriate breastfeeding (measures the proportion of infants of age 0-23 that are appropriately breastfed). Other optional breastfeeding indicators were ever BF (proportion of children born the last 24 months ever breastfed), continued BF at 2 years (proportion of children aged 20-23 months that breastfed), duration of breastfeeding (the median duration of breastfeeding <36 months) and milk frequency for non-breastfed children (proportion of non-breastfed children aged 6-23 months that consume 2 or more feedings).

Table 3.2 and **Table 3.3** present the core and optional indicators and their definitions developed and suggested by the WHO for the measurement and assessment of infant and child feeding practices.

and vegetables. A high quality diet was associated with the inclusion of minimum of four out the seven groups for BF and non-BF infants with the consumption of at least one protein group, one fruit or vegetable and one staple foods every day.

³ The minimum number of meals as defined by the WHO is (1) 2 times for breastfed infants 6-8 months, (2) 3 times for breastfed children 9-23 months, (3) 4 times for non-breastfed children 6-23 months

Table 3.2: Core WHO indicators for assessing infant and young child feeding practices

A) CORE INDICATORS	Definitions of BF indicators	Formulas of WHO definitions
1. Early Initiation of breastfeeding	The proportion of children born in the last 24 months who were put to the breast within one hour of birth	$\frac{\text{Children born the last 24 (or 12) months who were put to the breast within 1 hour}}{\text{Children born in the last 24 (or 12) months}}$
2. Exclusive Breastfeeding	Proportion of infants 0-5 months of age who are fed exclusively with breast milk	$\frac{\text{Infants 0 – 5 months of age who received only breast milk during the previous day}}{\text{Infants 0 – 5 months of age}}$
3. Continued breastfeeding at 1 year Continued Breastfeeding	Proportion of children 12-15 months of age who are breast fed	$\frac{\text{Children 12–15 months of age who received breast milk during the previous day}}{\text{Children 12–15 months of age}}$
4. Introduction of solid, semi-solid or soft foods	Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods	$\frac{\text{Infants 6 – 8 months of age who received solid, semi – solid or soft food during the previous day}}{\text{Infants 6 – 8 months of age}}$
5. Minimum Dietary Diversity	Proportion of children 6-23 months of age who received foods from 4 or more food groups	$\frac{\text{Children 6 – 23 months of age who received foods from 4 or more food groups}}{\text{Children 6 – 23 months of age}}$
6. Minimum Meal Frequency	Proportion of breast fed and non breastfed children 6-23 months of age who receive solid, semi-solid, or soft foods (including milk feeds for non-breastfed children) the min number of time or more	The indicator is calculated into 2 fractions: $\frac{\text{Breastfed children 6–23 months of age who received solid,semi–solid,or soft foods the minimum number of times or more during the previous day}}{\text{Breastfed children 6–23 months of age}}$ AND

A) <i>CORE INDICATORS</i>	Definitions of BF indicators	<i>Formulas of WHO definitions</i>
7. Minimum acceptable diet	% of children 6-23 months of age who receive a minimum acceptable diet (apart from breast milk) The indicator is calculated into 2 fractions	Breastfed children 6 – 23 months of age who received solid, semi – solid, or soft foods or milk feeds the minimum number of times or more during the previous day Breastfed children 6 – 23 months of age Breastfed children 6 – 23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day Breastfed children 6 – 23 months of age AND Breastfed children 6 – 23 months of age who had at least 2 milk feedings and at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day Breastfed children 6 – 23 months of age Children 6– 23 months of age who received an iron – rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day Children 6– 23 months of age
8. Consumption of iron-rich or iron-fortified foods	Proportion of children 6-23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children or that is fortified in the home	

Source: WHO (2008) Indicators for assessing infant and young child feeding practices (Part 1: Definitions)

Table 3.3: *Optional WHO indicators for assessing infant and young child feeding practices (2008)*

Optional Indicators	Definitions of BF indicators	Formulas of BF indicators
1. Children ever breastfed	Proportion of children born in the last 24 months who were ever breastfed	Children in the last 24 months who were ever breastfed
2. Continued breastfeeding at 2 years	Proportion of children 20-23 months of age who are breast fed	Children born in the last 24 months Children 20-23 months of age who received breast milk during the previous day
3. Age-appropriate breastfeeding	Proportion of children 0-23 months of age who are appropriately breastfed	Calculated into 2 fractions: Infants 0-5 months of age received only breast milk during the previous day Infants 0-5 months of age AND Infants 6-23 months of age who received breast milk, as well as solid, semi-solid or soft foods, during the previous day Infants 6-23 months of age
4. Predominant Breastfeeding under 6 months	Proportion of infants 0-5 months of age who are predominantly breastfed	Infants 0-5 months of age received breast milk as the predominant source of nourishment during the previous day Infants 0-5 months of age
5. Duration of breastfeeding	Median duration of breastfeeding among children less than 36 months of age	The age in months when 50% of children 0-35 months did not receive breast milk during the previous day

6. Bottle feeding	Proportion of children 0-23 months of age who are fed with a bottle	Children 0-23 months of age who were fed with a bottle during the previous day
		Children 0-23 months of age
7. Milk Feeding frequency for non-breastfed children	Proportion of non-breastfed children 6-23 months of age who receive at least 2 milk feedings	Non-breastfed children 6-23 months of age who receive at least 2 milk feedings during the previous day
		Non-breastfed children 6-23 months of age

Source: WHO (2008) Indicators for assessing infant and young child feeding practices (Part 1: Definitions)

The Canadian Breastfeeding Committee published a set of BF indicators in 2004 based on the WHO (1991) and Labbok and Krasovec (1990) indicators but with significant modifications and additions in relation with the definitions and the calculation of BF indicators. The Canadian Breastfeeding Committee proposed of collecting information on infant in the past seven days rather than the last 24 hours as suggested by the WHO. Even though, it adopted the WHO definition of EBF, it introduced an additional term, “Total” BF, which refers to EBF in the past seven days, not from birth in order to distinguish infants that might had been sporadically given from those that were EBF since birth. A completely different definition was given for Predominant Breastfeeding without distinguishing between infants that also receive formula (corresponds to the WHO definition of *Breastfeeding*) or those also receiving any other liquid (corresponds to the WHO definition *Predominant Breastfeeding*). On the contrary to the WHO definition (**see Table 3.1**), a predominantly breastfed infant receives breast milk as well as any liquid or solid including artificial formula limited to 1 or 2 feeds during the past seven days. Further, the term of partial BF was also included, but differently defined from that suggested by Labbok and Krasovec (1990) also without considering the recommended categorization (**see Table 3.4**). According to the Canadian Breastfeeding Committee, a partially breastfed infant received breast milk as well as three or more feeds of any solid or liquid including formula, the past seven days. For consistency and comparability reasons, specific time points were suggested for the estimation of BF indicators as well as the period that information on BF status should be collected. These are (1) initiation- at birth, (2) at hospital discharge, (3) at 2 weeks as a critical time point for mothers to receive support and avoid premature BF discontinuation (period of measurement: within 4 weeks after discharge) (4) at 2 months as a important time for EBF continuation support and delay introduction of complementary feeding (period of measurement: 5-12 weeks), (5) at 6 months to promote BF to one year and beyond (period of measurement: 21-27 weeks).

The WHO recommendations of measuring BF current practices aimed at facilitating cross-national comparability as well as minimizing maternal recall bias based on the previous 24hr method of measurement, rather than a retrospective (recall) method of assessment (Webb *et al.*, 2001; WHO, 2008). While these are the official indicators used by WHO member states, several national breastfeeding committees have suggested additional or slightly modified national indicators and/or methods of assessment. For instance, in the case of Australia, Webb *et al.* (2001) in their report

Towards a national system for monitoring breastfeeding in Australia, suggested two sets of indicators that would measure both BF recall and current practices. Additional recommendations by Webb *et al.* (2001) were provided for breastfeeding indicators measured on the basis of large-scale cross-sectional population based surveys. Few years later, an updated report on the *Australian National Breastfeeding Indicators* described the challenges faced on the development of breastfeeding indicators especially on the phrasing and the definition of BF indicators (AIHW, 2011). According to the updated Australian report (AIHW, 2011), “Breastfeeding within 1 hour after birth” should not be considered as an indicator but as a determinant of BF. The committee justified their decision on the basis that a proportion of infants is excluded from the indicator as conduct with the mother immediately after birth is not possible for all infants.

3.2 Methodological Issues

An indicator “*describes of a measurable and specific statistical construct for monitoring a progress towards a goal*” (Webb *et al.*, 2001). Despite the efforts that have been made to develop simple, valid and reliable indicators for measuring and reporting breastfeeding rates in a consistent manner, there are still many issues related with the methodology of the development of breastfeeding indicators and data collection that might lead to significant inaccuracies on the interpretation of the results. (Hector, 2011).

3.2.1 Current status

The WHO recommendation on implementing the 24-hour recall method in order to minimize recall bias (WHO, 2008) has been significantly criticized. This is due to the fact that this method has been associated with misclassification of exclusively breastfed infants (Aarts *et al.*, 2000; Hector, 2011). Specifically, exclusive breastfeeding rates might be overestimated since mothers reported that they might exclusively breastfed the previous 24-hours did not necessarily exclusively breastfed during the previous period since birth (Aarts *et al.*, 2000; Bland, 2003; Hector, 2011). In a study by Aarts *et al.*, (2000), significant differences were obtained in the estimation of BF rates when comparing the 24-hour recall with the “since birth” method. These differences were found to be as high as 40% in EBF rates at two and four months and decline to 9% at 6 months. However, this difference was mainly attributed to water given at the maternity clinic. Furthermore, the use of the 24-hour recall method requires significantly large sample sizes to estimate exclusive breastfeeding rates as different prevalence estimates need to be calculated for each period of interest on different sample of women (i.e. at 4th month, at 6th month and so on) (Webb *et al.*, 2001; Hector, 2011). Another issue that arises with 24-hour recall method is that the indicator estimates breastfeeding rates *at* each month of age rather than *up to* each month. For example, the WHO recommends measuring the proportion of exclusively breast-fed infants under six months (WHO, 2008; Hector, 2011). Therefore, the indicator provides an average of exclusive breastfeeding rates for infants aged 0-5.99 months but it cannot reflect the actual rates of breastfeeding duration and exclusivity from birth up to the sixth month (WHO, 2008; Hector, 2011; Greiner, 2014). Also, Hector, (2011) argues that in particular the indicator referring to exclusive breastfeeding at six months should not be considered since complementary feeding is initiated at

that time. Thus, exclusive breastfeeding rates at six months do not reflect duration of EBF up to that time point and the 24-h recall should be avoided for estimating EBF at that time point as it may lead to underestimation EBF rates at 6 months (Greiner, 2014). This suggestion might substantiate the significantly low (even nonexistent) rates of exclusivity estimated in many countries at six months (Hector, 2011).

3.2.2 Longer Recall

One of the main issues of the retrospective method to report breastfeeding rates is maternal recall bias (WHO, 2008; Hector, 2011). It has been suggested that mothers can not accurately recall breastfeeding (Bland, 2003) or exclusive breastfeeding duration (Agampodi et al. 2011). The misreporting of the actual timing of introduction of liquids and solids is more frequently leading to inaccurate estimation of exclusive breastfeeding duration. Defining the boundary points is another issue that usually lacks attention. According to WHO (2008), any liquid and solid is followed with the cessation of exclusive breastfeeding. Therefore, duration of exclusive breastfeeding can be estimated based on the period an exclusively breastfed infant receives only breastmilk. This means that exclusive breastfeeding should be estimated from birth and at each month, up to the reported month of cessation, but not at the specific month of exclusive breastfeeding of discontinuation (Hector, 2011). Another confusing issue arises when either BF or EBF discontinuation is reported before the first month. Even though, infants breastfed during the first days of their life but did not complete the first month, they cannot be considered to be breastfed at first month but at the same time they are not considered to be breastfed at all (Hector, 2011). Another concern is the timing of exclusive breastfeeding discontinuation. A question raised on this issue is whether EBF cessation should be either considered at the first or irregular introduction of liquids or/ and solids or when they are regularly initiated. For example, infants may be given breast milk substitutes and/ or other liquids during the first days at the maternity clinics, but after discharge they may be exclusively breastfed (Hector, 2011; Greiner, 2014).

In the case of the European Perinatal Survey (2010), three BF indicators were used to estimate breastfeeding within the first 48 hours after birth. These are (1) exclusive breastfeeding as defined by the WHO (WHO, 2008). It provides the percentage of exclusively breastfed infants i.e those that receive only BF and receive no other food or liquid except syrups or drops. The second indicator used was mixed breastfeeding. Mixed breastfed infants are those that receive breast milk

as well as any liquid or food including non-human milk. Finally, non-breastfeeding indicator provides the percentage of infant that did not breastfed at all during the first 48 hours. The Report, also, describes the methodological issues raised in the estimation of BF indicators in relation of the time of data collection that refer to BF status before hospital discharge and therefore may vary according to the length of hospital stay. The discrepancies in the time period that corresponds to data collection might influence the BF estimates. For example, in Cyprus information was collected with an interview during hospital stay at different time points and not precisely at 48 hours after birth (European Perinatal Health Report Group, 2010).

Table 3.4: Definitions and Aims of Breastfeeding Indicators developed by international and national organizations and committees

	Labbok & Krasovec (1990)¹	WHO (1991)²	WHO (2001)³	AFNMMU (2001)⁴- Australia	Canada (2004)⁵
Definitions	FBF: EBF: only BM and ALMOST EBF: also vitamins, minerals, water, juice or ritualistic feeds given infrequently Token: BF infrequent BF of insignificant quantity Partial: high (BF at least 80% of feeds), medium (BF 20-80% of total feeds), low (BF <20% of total feeds)	EBF: only BM (including colostrum, expressed BM or BM from wet nurse) PBF: BM (including expressed BM or BM from wet nurse) as the predominant form of infant feeding FBF: both EBF and PBF CBF: BM along with solid or semi-solid foods or formula NBF: No breast milk provided BF: BM provided	EBF: only BM (including colostrum, expressed BM or BM from wet nurse) PBF: BM (including expressed BM or BM from wet nurse) as the predominant form of infant feeding FBF: both EBF and PBF CBF: BM along with solid or semi-solid foods or formula NBF: No breast milk provided BF: BM provided	Adopted the WHO definitions	EBF: only BM given Total BF: only BM during the last 7 days Predominant BF: BM Plus <= 2 feedings from any liquid or solid Partial BF: BM Plus => 3 feedings from any liquid or solid No BF: no BM
Aim	For use in clinical practice and research	For national monitoring and international comparison	For national monitoring and international comparison; trends over time; support policy decisions	For national monitoring and standardization	NA
Methodology	NA	Household survey	Household survey/ population-based surveys	Cross-sectional population-based surveys	Not specified
Time frame	Not specified	24 h recall- current practice	24 h recall- current practice	24 h recall – current practice	Not specified

	Labbok & Krasovec (1990)¹	WHO (1991)²	WHO (2001)³	AFNMU (2001)⁴- Australia	Canada (2004)⁵
				Retrospective practice	
Time periods for data collection	Not specified	<= 24 months	<= 24 months		<= 24 months ⁴

Sources: ¹Labbok & Krasovec (1990): Toward consistency in breastfeeding definition; ²WHO (1991): Indicators for assessing breastfeeding practices; ³WHO (2008): Indicators for assessing infant and young child feeding practices Part1: Definitions; ⁴Webb *et al* (2001): Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps; ⁵The Breastfeeding Committee for Canada (2004): Breastfeeding Definitions and Data Collection Periods

⁴ **Recommended Data collection time periods:** 1. Initiation: at birth; At 2 weeks: hospital discharge - 4th week; 2months: 5 -12 weeks; 6 months: 21-27 weeks (Defined: within the period of $\pm$ 3-4 weeks of each month)

Optional data collection time periods: 1. 4 months-13-20weeks; 2. 8 months: 28-40 weeks; 3. 12 months: 11-15 months, 4. 18 months 16-21 months, 24 months: 22-25 months

3.3 Historical trends of Breastfeeding in the 20th century

In the beginning of the 20th century, breastfeeding rates were reduced substantially followed by the substitution of breastmilk with artificial feeding promoted by the multinational companies that supported the superiority of formula over breast feeding (Papastavrou *et al.* 2015). As a result, breastfeeding reached its lowest levels in the early 1970s, with only 22% of mothers initiating breastfeeding (Wright and Schanler, 2001). However, in the mid-1970s, a rising trend of breastfeeding initiation was observed that continued until the late 1980s, after which point they seem to have remained constant for about a decade (Papastavrou *et al.* 2015). Between 1985-1995, an increasing trend of 2.4% every year in this period had been reported for exclusive breastfeeding (WHO, 2014). During that period, the WHO/ UNICEF collaboration highlighted the inimitable characteristics of breastfeeding and focused on the protection, support and promotion of breastfeeding through the development and the implementation of international standards and policies. Breastfeeding was considered a public health priority and, substantial efforts had been made for its promotion as the optimal infant nourishment. This has led to an increase of exclusive breastfeeding rates worldwide from 14% to 38% between 1985-1995 followed by a decrease in most regions (WHO, 2014). However, 25 countries achieved an increase of EBF by at least of 20 percentage points in the next 10 years (WHO, 2013).

3.3.1 Current Status of breastfeeding internationally

Even though breastfeeding initiation rates have been rising during the past decades, premature discontinuation is still reported in most countries. Globally, the prevalence of exclusive breastfeeding for infants 0-6 months is reported to be 38% (Black *et al.* 2013). This falls short of the *World Health Assembly Global target for Nutrition* by 2025, which called for an increase in the global rate of exclusive breastfeeding in the first six months (infants aged 0-5.9 month) to at least 50% (Victora *et al.* 2016; Bagci Bosi *et al.* 2015). Of course, the prevalence of initiation and duration of breastfeeding varies widely both worldwide (Victora *et al.* 2016) as well as across European countries (EuroPerinatal Survey, 2010; Bagci Bosi *et al.* 2015). For a number of countries, data on breastfeeding is limited or even nonexistent (Bagci Bosi *et al.* 2015).

3.4 Epidemiology of Breastfeeding and Exclusive Breastfeeding

The paper by Victora *et al* (2016) in the Lancet Breastfeeding Series published in 2016 focused on the description of the past and current global trends of BF according to the country income group and designated the short-and long term BF health benefits on both the infant and the mother. Information was received for 127 of 139 low and middle income countries (LMICs) and for 37 of 75 high-income countries. Assessment of global BF rates in the present review was based on the estimation WHO indicators. These are early BF initiation (children born the past 24 months who BF within one hour after birth) and EBF under six months (i.e. infants aged 0-5 months that were EBF). The latter indicator was estimated on the basis of the last 24 hours (not EBF since birth). The indicators “continued BF at first year” (i.e. infants aged 12-25 months that BF) and “continued BF at 2 years” (i.e. infants aged 20-23 months that BF) were also estimated. However, for most of the high income countries the estimates of the aforementioned indicators were not reported. In order to allow international comparisons, especially between high income and LMICs, the following indicators were also calculated: (1) ever BF (i.e. breastfed infants even for a short period), (2) BF at 6 months [i.e. in high income countries: infants that BF from birth to six months or older; in LMICs with standardized surveys infants aged 4-7 months (median age: 6 months) that BF] and (3) BF at 12 months [i.e. in high income countries: infants that BF for 12 months or longer; in LMICs children aged 10-13 months (median age: 12 months) who are BF]. Early BF initiation, exclusive BF or continued BF at two years were not available for most of the high income countries.

The European review by Bagci Bosi *et al.* (2015) described the current situation of BF practices in different European countries. The authors discussed the estimates of early BF initiation (within 1 hour), EBF under 4 and 6 months, at 6 months and continued BF at first month. In summary, early BF initiation is very high in some countries but there is a rapid decline of EBF especially between 4- 6 months. Substantial differences in EBF rates were observed across the European countries, but EBF rates were well below the international and national recommendations. In both cases, data from Cyprus were not considered due to lack of studies or formal data.

3.4.1 Breastfeeding and Exclusive Breastfeeding in low-income countries

Even though significant improvements have been observed in the prevalence of exclusive breastfeeding in developing countries, the WHO recommendations are still not being met (Cai, Wardlaw and Brown, 2012; Victora *et al.*, 2016). It has been reported that only 43% of infants under 6 months (0-5 months) of age breastfed exclusively in 2015 (UNICEF, 2016). However, this constitutes a small increase from the 39% reported in 2010 (Cai, Wardlaw and Brown, 2012). The greatest increase in exclusive breastfeeding rates was observed in West and Central Africa from 12% reported in 1995 to 28% in 2010 (Cai, Wardlaw and Brown, 2012), with a slight increase in the next five-year period to 30% (UNICEF, 2016). In the Middle East and North Africa, EBF was 33% in 2015 from 26% in 2000 (UNICEF, 2016). An increasing trend was observed in Eastern and Southern Africa where 57% of infants breastfed exclusively in 2015, from 47% in 2010 and 35% in 1995 (Cai, Wardlaw and Brown, 2012).

EBF in East Asia, excluding China due to insufficient data, remained stable at about 30% the past twenty years (Cai, Wardlaw and Brown, 2012; UNICEF, 2016). A slight increase was indicated in South Asia from 40% in 1995 to 45% in 2010 (Cai, Wardlaw and Brown, 2012), but within a five years –period, EBF scaled up to 64% in 2015 (UNICEF, 2016). About 30% of infants breastfed exclusively in 2015 in Central and Eastern Europe and the Commonwealth of Independent States from 20% in 2000 (UNICEF, 2016). It should be noted that the Russia Federation was not included in the analysis due to insufficient data. In the Pacific and Latin America and the Caribbean, exclusive breastfeeding remained unchanged from 31% in 2000 to 33% in 2015 (UNICEF, 2016).

Reported breastfeeding initiation rates were also low in 2015. Around 43% of mothers in these regions initiated breastfeeding within one hour after birth (UNICEF, 2016). The proportion of infants that breastfed within one hour after birth ranged between 40% in West and Central Africa and 59% in Eastern and Southern Africa (UNICEF, 2016).

3.4.2 Breastfeeding and Exclusive Breastfeeding in high-income countries

The first from the two Breastfeeding Lancet Series by Victora and colleagues (2016) aimed to estimate and compare the global BF trends and make comparisons between low - medium income

countries with high income countries, to present the potential short- and long term benefits of BF and delineate the potential reduction of mortality and morbidity with the increase of BF. Data used for the calculation of the WHO indicators for LMICs mentioned in the previous section (**Section 3.4**) were extracted and reanalyzed from national surveys, including Demographic and Health Surveys, Multiple Indicator Cluster Surveys etc. As indicated by the authors, the majority of the surveys reported of over 90% response rate. In relation with high-income countries, the authors derived the findings by conducting systematic reviews of the published studies and grey literature. For data not easily available or when there was an uncertainty, information was derived from public health practitioners or local researchers. Another issue raised on data collection was that national data were not available for many countries. Even though, 27 out of the 35 high income countries had some information at a national level, still the response rate ranged between 50-70%, the indicators were not standardized and the recall periods were long.

The recently published European Review by Bagci Bosi *et al.* (2015) also focused on the collection of data derived from national surveys. Otherwise, data were extracted from interventions or prospective studies, the WHO global databank on Infant and Young Child Feeding and the Organisation for Economic Co-operation and Development (OECD) family database. As the authors indicate, special attention should be noted on the interpretation of findings as well as on data comparability.

Studies from selected developed countries will be presented in the following sections. **Table 3.5** presents the main characteristics and findings of some of the epidemiological studies.

3.4.2.1 Estimates of Breastfeeding Initiation

While an increase in breastfeeding initiation rates has been documented across many high-income countries in recent decades, there are still significant cross-national differences based on the more recent estimates which range from as low as 55.3% in Ireland to as high as 99% in Finland. The highest breastfeeding initiation rates have been reported in Scandinavia with Finland (Erkkola *et al.*, 2010) leading with 99% and followed by Sweden with 97% (Hornell *et al.* 2013), Iceland with 98% (Hornell *et al.* 2013) and Denmark with 95% (Hornell *et al.* 2013). Australia also records high breastfeeding initiation rates at around 93% (93.8% and 93.3% reported respectively in Scott *et al.* (2006) and Magarey *et al.*, (2016). The breastfeeding initiation rates were just short of 90%

in Germany (Kohlhuber *et al.*, 2008) and Canada (Gionet, 2013), while in Greece initiation was around 87.5% for the first sample and 87.9% for the second sample (Gaki *et al.* 2009).

While in most high-income countries, there has been an upward trend in initiation rates, in Italy, a slight reduction of breastfeeding initiation rates was reported from 94% in 1993 (Victora *et al.* 2016) to 91.6% for the native and 88.6% for the non-native population in recent years (Lauria *et al.* 2016). Among the countries with the lowest breastfeeding initiation rates were Austria with 80% (Victora *et al.* 2016), the Netherlands with 75% (Victora *et al.* 2016), the UK with 81% (up from 69%) in the year 2000 (McAndrew *et al.*, 2012), France with 62.3% (European Perinatal Report, 2010), Malta with 68.3% (European Perinatal Health Report, 2010) and Ireland in the last place with 55.3% (Layte and McCrory, 2014; Victora *et al.*, 2016).

3.4.2.2 Estimates of Breastfeeding Duration during the first six months

Duration of breastfeeding during the first six months varies considerably between European and other high-income countries. Prevalence of breastfeeding during the first six months was high in Scandinavian countries. In Norway, earlier estimates suggested that almost all infants continue to breastfeed for the first six months (96% reported in Lande *et al.*, 2007). In recent years, the prevalence of BF at six months in Norway seem to have decreased to around 71% but it was still well above the WHO target (Victora *et al.*, 2016). On the other hand, breastfeeding rates at six months in Sweden fell from 72.2% in 2000 (Hofvander, 2005) to 52% in 2012 (Victora *et al.*, 2016). A similar picture is reported with regards to the six-month breastfeeding prevalence in Finland with 58% (Erkkola *et al.*, 2010) and in Italy with 57.2% (Lauria *et al.* 2016). In Australia, the prevalence of BF at 6 months was reported at 56% in 2010 (Victora *et al.*, 2016) which represented an increase from 41.7% compared to the immediately previous period 2008-2009 (Magarey *et al.*, 2016). About half of the mothers (51.8%) in the US (CDC, 2016) and Germany (51.8%; (Kohlhuber *et al.*, 2008; Rebhan *et al.*, 2009; Victora *et al.*, 2016) continue to breastfeed at six months. In the UK (34%; McAndrew *et al.*, 2012), the Netherlands (32%; Victora *et al.*, 2016) and in Canada (30%; Gionet, 2013), only one in three mothers continue to breastfeed at sixth months. The lowest breastfeeding rates at six months in Europe were observed in France with 23% (Victora *et al.*, 2016) and Denmark with 13% (Victora *et al.*, 2016).

3.4.2.3 Estimates of Exclusive Breastfeeding Duration during the first six months

In the U.S, exclusive breastfeeding was reported to be around 44.4% at 3 months and to be reduced to 22.3% at six months (CDC, 2016). Similarly, EBF in Germany was reported to be around 44.7% and 41.7% at the second and fourth months respectively, after which it falls to 21.4% at the sixth month (Kohlhuber *et al.*, 2008). Slightly higher EBF for the first six months was reported in Canada with 26% in 2011-2012 (Gionet, 2013) which doubled since 2006 (13.8%; (Chalmers *et al.*, 2009; Al-Sahab *et al.*, 2010). In Japan, exclusive breastfeeding rates during the first six months did not exceed 21% (Kaneko *et al.* 2006).

Even though, rates of EBF in Norway are considered to be among the highest in the world during the period of the first six months with 82% at the first month and 63% at three months, a rapid decrease is observed by the fourth month when they are dropping to 46% of infants EBF and a sharp decrease to 9% at six months (Hornell *et al.* 2013). Similar decreasing EBF trajectories were observed in Sweden from 67% at 2 months to 51% at four months and 11% at 6 months (Hornell *et al.* 2013). Significantly lower, and not exceeding 1%. was the prevalence of exclusive breastfeeding at six months in some European countries, including Finland (Erkkola *et al.*, 2010; Hornell *et al.* 2013) and Australia (Scott, 2006) which otherwise have generally high breastfeeding initiation as well as breastfeeding duration rates.

3.4.2.4 Cross-national comparisons

Table 3.5 presents the main characteristics and findings of selected epidemiological studies conducted in developed countries to estimate EBF and BF. However, the different methods across studies used for the estimation of BF and EBF raise difficulties in cross-national comparisons. For example, a survey of retrospective design was conducted in Canada (Chalmers *et al.*, 2009; Al-Sahab *et al.*, 2010), while studies of cohort or prospective design were conducted for the estimation of BF indicators in other countries (Scott, 2006; Kohlhuber *et al.*, 2008; Erkkola *et al.*, 2010; Rebhan *et al.* 2009). Differences in the definitions of BF indicators and the methodology used for their calculations also raise interpretation issues and comparability problems (Bagci Bosi *et al.* 2015). For example, EBF at six months in the prospective study conducted by Scott *et al.* (2006) was calculated in the basis of the WHO definitions (**See Table 3.1**) using the “24 hour recall”

method. For this reason, EBF rate at six months reported was marginally non-existent ($<1\%$). On the contrary, in the survey by Al-Sahab *et al.* (2010) EBF infants were those that received only BM without in any other food or liquid, according to the WHO definition, for the first months since birth. For this reason, EBF rates at six months were significantly higher than in Australia. Additionally to EBF, Kohlhuber *et al.* (2008) calculated full and partial BF indicators which were not considered from the previous studies, making it difficult to make comparisons in relation with the findings on BF status.

Table 3.5: *Studies on the Prevalence of BF and EBF duration up to the sixth month in select high-income countries*

Study Design	Country	BF and EBF Initiation	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct	Reference
Maternity Experience Survey Nationwide survey	Canada	NR	13.8%	53.9%	NR	1 st month: 63.6% 4 th month: 41.4%	5,615 mothers selected from the Canadian Census aged ≥ 15 years between the 5 th - 14 th month postpartum	Canadian provinces and territories	2006	Al- Sahab <i>et al.</i> (2010)
Maternity Experience Survey Nationwide survey	Canada	BF: 90.3%	14.4%	53.9%	3 months 67.6%	3 months: 51.7%	6,421 mothers from the Canadian Census stratified by province or territory of place of birth, age, area of residence (urban/ rural), parity	Canadian provinces and territories	2006	Chalmers <i>et al</i> (2009)
Second Perth Infant Feeding	Australia	BF: 93.8%, EBF: 75.6%	<1%	Any BF: 45.8%	NR	NR	Participants: 587 mothers	Perth	Mid-Sept 2002- mid July 2003	Scott <i>et al.</i> 2006

Study Design	Country	BF and EBF Initiation	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct	Reference
Study (PIFSII)				Full BF: 12.0%			Setting: 2 maternity clinics – 4, 10, 16, 22, 32, 40 and 52 weeks			
Randomized controlled trial (NOURISH) and prospective study (SAIDI)	Australia	NR	NR	41.7%	1 month: 70.4% End of 2 months: 59.5%	NR	1193 mother-infant pairs Setting: private and public hospitals in the two cities and 7 regional hospitals (SAIDI only)	Brisbane (NOURISH), Adelaide (SAIDI)	Feb 2008–March 2009	Magarey <i>et al</i> (2016)
Population based Birth cohort	Finland	BF: 99% EBF: NA	58%	1%	BF 1month: 92% 4 months: 72%	EBF 1 month: 56% 3 months: 32% 4 months: 20%	5993 infants at risk for the development of type 1 diabetes (genetically predisposed – carriers of the HLA (human leukocyte	Oulu (Oulu University Hospital) and Tampere (Tampere University	2 Sept 1996--31 Aug 2004 20 Oct 1997- 5 Sept 2004	Erkkola <i>et al.</i> (2010)

Study Design	Country	BF and EBF Initiation	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct	Reference
Population-based follow up survey	Italy	Italians:	Italians:	Italians:	3months	3months	antigen) – recruited from the DIPP cohort	y Hospital)	2008/2009 2010/2011	Lauria <i>et al</i> (2016)
		BF: 91.6%, EBF:57.2% (at discharge) Foreigners: BF: 88.9%, EBF:66.4%	EBF: 5.5% Foreigners: EBF: 8.3%	BF: 57.2% Foreigners: BF: 66.4%	Italians: BF: 71.6% Foreigners: BF: 74.1% 12months BF: 32.5% Foreigners: BF: 24.1%	Italians: EBF: 48.6% Foreigners: EBF: 53.8%	Setting: 25/79 local health units Participants: 6942 mothers At discharge: 1-4 days, 3 months: 90-120 days, 6 months: 180-210 days, 12 months: 365-395 days	11/20 regions		
Community-based cross sectional study	China	BF:59.4%	EBF:28.7%	Predominant BF=68.8%	Not Reported	3-4 months: 29.1% 5-6 months: 13.6%	4368 children from 209 villages (2577 younger than 2 years)	26 poor counties in 12 central and	2010	Guo <i>et al.</i> 2013

Study Design	Country	BF and EBF Initiation	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct	Reference
Prospective Cohort study	Germany	89.5%	52%	21.4%	69.7% (2months) 60.6% (4months)	44.7% (2months) 41.7% (4months)	3822	western provinces of China State of Bavaria-maternity clinics, birth houses	April 2005	Kohlhuber <i>et al</i> (2008); Rebhan <i>et al.</i> 2009
Cross-sectional study -The Norwegian Infant Nutrition Survey	Norway	NA	80%	7%	1 month: 96% 4 months: 85% 6 months: 80%	1 month: 90% 3 months: 70% 3 months: 44% 6 months: 7%	2383		27 April - 17 May 1998	Lende <i>et al.</i> 2003

NR: Not Reported

3.4.3 Prevalence of Breastfeeding and Exclusive Breastfeeding in Greece

Data on the prevalence of Breastfeeding and Exclusive Breastfeeding in Greece presents a similar picture with other westernized countries. Although BF initiation rates are relatively high, BF continuation rates fall prematurely with only a small proportion of mothers breastfeeding exclusively at six months. The only nationwide study “*National Survey for Breastfeeding Frequency and Determinants*” (Gaki *et al.* 2009) to estimate BF prevalence based on the WHO definitions was conducted during the period 2006-2007 with the recruitment of 1800 women in two samples from 39 and 40 maternity clinics respectively located in different areas in Greece. The first sample of mother-infant dyads was followed for six months while the second sample was followed up for 12 months. In both samples breastfeeding initiation rates (proportion of infants that BF within the first 24 hours) were relatively high at 87.9% and 87.5%, respectively. A proportion of 39.4% of mothers of sample 1 and 35.8% of sample 2 continued BF at three months after which it dropped to 22.0% and 18.2% at six months, respectively. Exclusive BF initiation rates were 41.1% for both samples. At the end of the third month, about one out ten infants continued EBF (11.1% for sample 1 and 9.5% for sample 2) and EBF rates by the end of the six months were less than 1% in both samples (0.9% for sample 1 and 0.4% for sample 2).

In the Rhea study (Vassilaki *et al.*, 2014), a large prospective cohort study conducted in Crete with the participation of 1181 mothers, BF estimates were similar to those reported by Gaki *et al.* (2009). About 80% of the participating mothers initiated breastfeeding within the first four days after birth. In contrast though to the nationwide study, the Rhea study identified an abrupt reduction by the first month of the infant’s life with only 21.2% of the mothers reporting BF, the majority of whom were exclusively breastfeeding (17.8%). It is not clear whether the different findings in the Rhea cohort are indicative of a true difference between Crete and the rest of Greece, or whether it is more likely to reflect the different methodologies across studies (e.g. survey vs cohort), including the potential effect of selection bias due to the non-participation in the cohort study. By the fourth month, EBF in the Rhea study dropped further to almost half (9%) whereas BF cessation increased to 67.2% from 17.7% at first month with the highest decrease being observed between the first and the second month (from 17.7% to 41.7%). At the sixth month, the prevalence of EBF was only 0.3% while about eight in ten mothers (78.3%) reported BF cessation by the sixth month.

Similar or even higher BF initiation was reported in other studies among Greek women (Pechlivani *et al.*, 2005; Theofilogiannakou *et al.*, 2006; Bakoula *et al.*, 2007), generally ranging between 85% to 96.1%. A cross-sectional study with the participation of 1603 mothers recruited from the area of Athens reported that a proportion of 19.1% mothers initiated exclusive breastfeeding during their hospital stay (Pechlivani *et al.*, 2005). A more recent study conducted in the area of Attica found slightly higher prevalence of EBF initiation (44.4%), whereas it reported that only 7.9% of the infants were formula fed (Tavoulari *et al.*, 2015). The study was conducted in a maternity ward of a tertiary University hospital in Athens monitoring high-risk pregnancies nationwide. Most probably, mothers that initiated EBF were more likely to consent their participation in the study potentially leading to selection bias and thus to an overestimation of EBF initiation. It should be noted that the proportion of participating infants that either EBF or BF was similar to that of the non-participating infants (any BF: 92.1% vs 91.4%, respectively).

Perhaps non-surprisingly, higher prevalence of EBF was reported in one of the two Baby-Friendly Hospital Initiative (BFH) accredited hospitals in Greece, during the period of accreditation, where breastfeeding prevalence was reported to be 61% and 35.5% at three and six months, respectively, while EBF was reported to be 46.1% at three months and 23.4% at six months (Bouras *et al.*, 2013). **Table 3.6** summarises the aforementioned Greek studies that estimated BF and EBF up to the sixth month after birth.

Table 3.6: *Studies on the Prevalence of BF and EBF duration up to the sixth month in Greece*

Reference	Study Design	BF and EBF Initiation Rates	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct
Tavoulari et al. 2015	Cross-sectional study	Partial BF: 47.7% EBF: 44.4% FF: 7.9%	NR	NR	NR	NR	428 mothers 1 tertiary University Hospital	Prefecture of Attica	February 2009-December 2009
Bouras et al. 2013	Prospective study	BF: 87.94%; EBF: not stated	23.4%	Partial BF: 12.1% FF: 64.5%	3 months FF: 39%; Partial BF: 14.9%	3 months EBF: 46.1%	145 mothers 1 public hospital (Attikon - certified as Baby Friendly Hospital as from Nov 2011)	Athens	September 2008-December 2008
Gaki et al. 2009	Population-based surveys	Sample 1: BF: 87.9%, EBF: 41.1%; Sample 2: BF: 87.5%, EBF: 41.1%	Sample 1: BF: 22.0%, EBF: 0.9% Sample 2: BF: 18.2%, EBF: 0.4%	Sample 1: 22.0%, Sample 2: 18.2%	1 st week: Sample 1: BF: 82.9%, Sample 2: BF: 80.4%, 1 st month Sample 1: BF: 60.2%, Sample 2: BF: 57.2%, 3 rd month Sample 1: BF: 39.6%, Sample 2: BF: 35.8%,	1 st week: Sample 1: EBF: 37.4%, Sample 2: EBF: 36.9% 1 st month or 2 nd ? Sample 1: EBF: 20.7%, Sample 2: EBF: 20.4% 3 rd month or 4 th ??	Sample 1: 900 mother –infant pairs 40 maternity clinics/ Hospitals in Greece Sample 2: 900 mother infant pairs	Greece	April 2007-Jul 2007 (Sample 1) June 2006-Dec 2006 (Sample 1)

Reference	Study Design	BF and EBF Initiation Rates	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct
					6 th month: Sample 1: BF: 22.0%, Sample 2: BF: 18.2%,	Sample 1: EBF: 11.1% Sample 2: EBF:9.5% 6 th month Sample 1: EBF: 0.9% Sample 2: EBF:0.4%			
Bakoula et al. 2007	Prospective study	BF: 85% (Full BF: 23%, Partial BF: 62%)	NR	NR	4 weeks: BF (any): 79% (Full BF: 61%, Partial BF: 18%)	NR	4310 mothers from 7 hospitals 2 private and 2 university hospitals, 1 hospital in the procedure of acquiring the BFHI accreditation, 2 hospital from the eastern and central Greece	Greece	2000
Theofilogiannakou et al. 2006	Prospective study	BF: 85%; EBF: not stated	16%	12%	40 days: 55%	40 days: 35%	312 mothers (208 mothers from 1 public university maternity hospital ; 21 from other public	Athens	September 2003-February 2004

Reference	Study Design	BF and EBF Initiation Rates	EBF at 6 months	BF at 6 months	BF at other time points	EBF at other time points	Participants	Area of study conduct	Period of Study Conduct
							maternity hospitals 82 from 3 private maternity clinics and the outpatient department of children's university hospital)		
Pechlivan i et al. 2005	Prospective study	BF: 96.1% EBF: 19.1% Predominant BF: 7.2% Complementary BF: 69.8%	NR	NR	NR	NR	1603 mothers 3 private and 2 public hospitals	Athens	October 2001
Antoniou et al. 2005	Cross-sectional study	EBF: 52.9% BF: 32.9% FF: 14.2%	NR	NR	Months: Total (Greek women only) 1-2: 18.4% (18.1%) 2-4: 26% (26.6%) 4-6: 17.1% (17.6%)	NR	911 mothers- 938 infants 17 maternity hospitals	Greece	Jan –Aug 2001

NR=Not Reported

3.4.4 Prevalence of Breastfeeding and Exclusive Breastfeeding in Cyprus

Evidence on the prevalence of BF and EBF in Cyprus is limited. According to the EuroPerinatal Survey (2010), Cyprus ranks amongst the lowest positions in terms of the initiation of breastfeeding and exclusive breastfeeding at 48 hours. The reported estimates originate from a Perinatal Survey by the Cyprus Statistical Services, covering both public maternity wards and private clinics and refer to the year 2007. The survey suggested that only 16% of infants were exclusively breastfed during the first 48 hours, while as many as 33.8% of mothers did not breastfeed at all (Cyprus Perinatal Survey, 2010). Other than outdated by nearly a decade, the survey only captured the first 48 hours. Reported statistics from maternity wards in public hospitals by the Cyprus Ministry of Health covering period 2007-2012 suggest a somewhat better picture [Ministry of Health (2015). Cyprus Public Maternity Units: Perinatal Health Indicators for the years of 2007-2012; available at http://www.europeristat.com/images/Perinatal_Health_Report_2013_Cyprus_Public_Maternity_Units_2007-2012.pdf]. Nevertheless, the prevalence of exclusive breastfeeding at 48 hours was still low with 28.1 % in 2007-2012 (Range: 20.2%-37.5%).

The latest 2014 Perinatal Survey of the Ministry of Health, which also included the private sector where as many as 74.5% of birth take place, suggests little improvement in over a decade [Ministry of Health (2016). Cyprus Public and Private Maternity Units: Perinatal Health Indicators for the year 2014; available at [http://www.moh.gov.cy/moh/moh.nsf/All/8DC461429CBC4DE7C22579CE002EF07D/\\$file/Perinatal%20Health%20Report%202016_Cyprus%20Maternity%20Units%202014.pdf](http://www.moh.gov.cy/moh/moh.nsf/All/8DC461429CBC4DE7C22579CE002EF07D/$file/Perinatal%20Health%20Report%202016_Cyprus%20Maternity%20Units%202014.pdf)].

The same report provides estimates of EBF and BF for the public sector by district in the year 2013. While BF initiation was estimated above 90% for all districts, with the exception of Nicosia which was found to be slightly lower at 87.9%, there appeared to be substantial variability in the prevalence of EBF at 48 hours which seem to vary from 2.4% in Ammochostos to 43.7% in Limassol.

A recently published study (Isaia *et al.*, 2017) investigated the BF and EBF prevalence in Cyprus. Isaia *et al.*, (2017) conducted a cross-sectional study with the participation

of 128 Greek-speaking mothers of infants aged 6-18 months. Recruitment was carried out when mothers visited the seven healthcare centers situated in the urban area of Nicosia (capital city of Cyprus) during the study period for the first infant vaccination. Mothers completed a questionnaire by personal interview. The questionnaire was developed for the *National Survey for Breastfeeding Frequency and Determinants* (Gaki *et al.* 2009). The findings suggested that about nine out of ten women initiate BF (93%). However, the prevalence of BF fell gradually to 37.5% at six months. The prevalence of Exclusive Breastfeeding in this study appeared slightly higher than what was reported in the 2015 National Perinatal Health Survey, with only 1 in 3 mothers reporting exclusive breastfeeding during their stay in the maternity clinic. A gradual reduction of EBF was observed, with only 4.7% of mothers reporting EBF at six months.

3.5 Determinants of Breastfeeding

Multiple determinants have been investigated with regards to their effect on either successful breastfeeding initiation and/or continuation. Most of the existing research on BF determinants focuses on maternal and infant attributes (Hector *et al.*, 2005). However, the determinants of breastfeeding extent well beyond mother-infant dyad individual characteristics, and include factors that originate or operate at higher levels including the immediate social environment (e.g. social support), organizational factors (e.g. maternity clinic practices) and the wider community and policy environment that may directly or indirectly influence maternal BF behavior (Tiedje *et al.* 2002; Hector *et al.*, 2005). To capture the ecological (contextual) perspective of BF, it is important to identify and describe the factors that influence the BF behaviors by their ecological status (Tiedje *et al.* 2002; Sallis, Owen and Fisher, 2008). Characteristically, Tiedje *et al.* 2002 commented upon the multiple contextual determinants of breastfeeding in the context of designing successful interventions to tackle the low breastfeeding rates in the USA: «...*Efforts to improve rates of breastfeeding in this country [USA] to meet year 2010 goals must consider the many contextual factors that influence feeding. Interventions to promote breastfeeding should exceed the individual level, and occur at many layers simultaneously. The ecological model provides direction for the multiple interventions needed to increase rates and duration of breastfeeding.*».

The social-ecological model is used as a theory-based framework that is configured by the integration of multifactorial levels to explain the complexity of BF behaviors and outcomes. Each of these levels describes an interplay of the different BF-related determinants. In this section, literature-based evidence is cited on the effect of potential BF determinants on BF behavior using the social-ecological model as a framework to organize and structure the vast literature of breastfeeding determinants including intra-personal and inter-personal determinants, organizational determinants, workplace and community-level determinants and finally, policy-level determinants. **Figure 3.1** presents the social ecological model of breastfeeding.

3.5.1 Individual-Intrapersonal Characteristics

The first level of the social ecological model identifies the personal socio-demographic and intra-personal maternal characteristics (e.g. self-efficacy) that define maternal BF behavior (Sallis, Owen and Fisher, 2008; Tiedje *et al.* 2002). Many demographic, lifestyle, psycho-social and biomedical maternal characteristics are recognized as potential determinants of BF behavior. Among these are maternal age, education attainment, socioeconomic status, ethnicity, marital status, parity, smoking, pre-pregnancy maternal body weight, and more directly relevant to this thesis, self-efficacy, which will be discussed in more detail in Chapter 4.

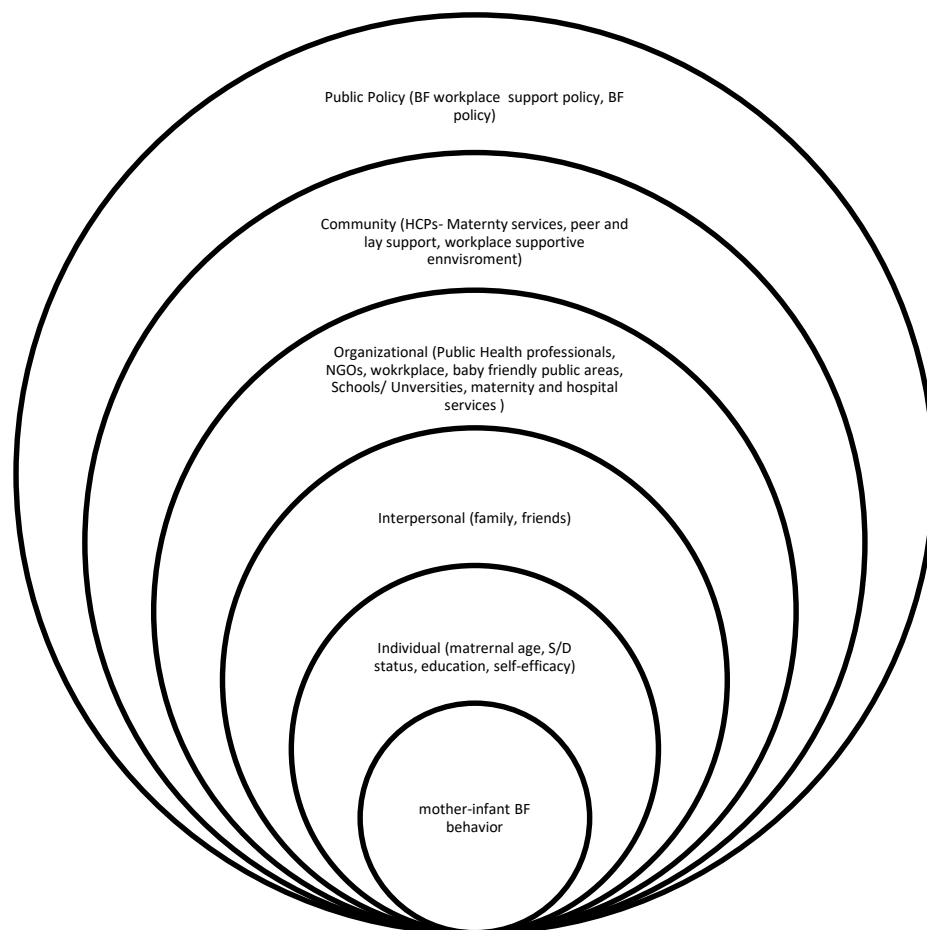


Figure 3.1: *The Social Ecological Model of Breastfeeding*

3.5.1.1 Maternal Age

Even though earlier studies had consistently showed of a positive association between BF and maternal age (Dennis, 2002; Scott *et al.*, 2006; Scott and Binns, 1999; Thulier and Mercer, 2009), more recent studies report no association with age (Scott *et al.*, 2006) or even a positive association between BF initiation and younger age (Theofilogiannakou *et al.*, 2006; Bakoula *et al.*, 2007). The Cyprus MoH Perinatal Survey does not include any information with regards to age-differences in BF initiation and exclusivity.

3.5.1.2 Education Attainment

The majority of studies have shown a positive association between educational attainment and BF duration (Scott and Binns, 1999; Scott *et al.*, 2001; Scott *et al.*, 2006; Dennis, 2002; Theofilogiannakou *et al.*, 2006; Thulier and Mercer, 2009; Gaki *et al.*, 2009). A number of studies, however, have found no association between educational attainment with either BF initiation (Tavoulari *et al.*, 2015) or duration (Scott *et al.*, 2006). The 2016 Lancet review (Victora *et al.*, 2016) found evidence to suggest that at least in high-income countries “...*better-educated women breastfeed more commonly than do those in low-income groups with fewer years of formal education*”. They suggested that this represents a social gradient reversal since in previous decades breastfeeding was more common in mothers with lower education, at least until the 1960s in the case of the USA. It is very likely that a similar social gradient reversal occurred in most high-income countries at different time period and at a different rate. The Cyprus MoH Perinatal Survey does not include any information with regards to difference in BF initiation or exclusivity by educational attainment.

3.5.1.3 Smoking

Consistent evidence suggests a negative association between smoking and BF initiation and duration (Dennis, 2002; Ekstrom, Widstrom and Nissen, 2003; Scott *et al.*, 2006; Baghurst *et al.*, 2007; Thuller and Mercer, 2009; Gaki *et al.*, 2009; Inoue *et al.*, 2012; Vassilaki *et al.*, 2014). Smoking inhibits prolactin release and induces somastatin levels. On the other hand, breastfeeding is associated with low levels of somastatin and enhances the levels of gastrin, cholestyctokinin and insulin that result to anabolic

metabolism and digestion. Nevertheless, the high levels of somastatin in mothers that smoke are followed by suppression of the anabolic metabolism and breast milk production (Ekstrom, Widstrom & Nissen, 2003). However, it has been suggested that premature discontinuation or non-initiation of BF in smokers is more likely due to lack of motivation rather than the physiological effect of smoking on BF (Donath and Amir, 2008). The Cyprus MoH Perinatal Survey does not include any information with regards to differences in BF initiation or exclusivity by smoking status.

3.5.1.4 Maternal Body Weight

Maternal obesity or overweight before pregnancy has been identified as a potential risk factor of BF initiation and continuation during the first six months (Scott *et al.*, 2006; Theofilogiannakou *et al.*, 2006; Amir and Donath, 2007; Manios *et al.*, 2009; Tavoulari *et al.*, 2015). A variety of physiological, behavioral and cultural reasons have been proposed to explain the association of maternal body weight and BF behavior. Delayed lactogenesis II (Amir and Donath, 2007; Scott *et al.* 2006) is the principal reason of premature BF discontinuation in obese or overweight mothers even from the first days. Because of the belief of lack of breast milk supply, mothers tend to cease any effort to initiate BF even from the first days that may hinder establishment of BF leading to shorter BF duration (Amir and Donath, 2007). However, it has also been suggested that obese mothers may be less motivated to BF (Amir and Donath, 2007) due to low self-image as well as lower self-confidence to breastfeed in public (Lepe *et al.*, 2011). The Cyprus MoH Perinatal Survey does not include any information with regards to differences in BF initiation or exclusivity by maternal body weight.

3.5.1.5 Ethnicity

In many high-income countries, significant differences in breastfeeding are reported between different ethnic groups. For example in the USA, breastfeeding rates are lower among mothers of African American (Dennis, 2002; Ryan, Wenjun and Acosta, 2002) and Hispanic origin than white American women (Dennis, 2002). Generally, these differences are attributed to a large extent to differences in socio-economic position (e.g. educational attainment, income, etc) (Dennis, 2002). In Australia, Scott *et al.*, (2001) suggested that native mothers were about two times more likely to initiate BF (OR: 1.98; 95% CI: 1.14-3.43), but this association was not apparent for BF duration. Interestingly, in Greece, while nationality was not associated with the initiation of BF,

there was an association with the duration of breastfeeding, as a lower proportion of Greek-native mothers compared to non-Greek women were breastfeeding at three and six months (Gaki *et al.* 2009). The Cyprus MoH Perinatal Survey does not include any information with regards to differences in BF initiation or exclusivity by ethnic/national background of the mother.

3.5.1.6 Socio-economic position

Socio-economic position is an important determinant of both initiation as well as duration of breastfeeding (Dennis, 2002). Mothers with higher family income are more likely to have more favorable attitudes and behavior towards BF. In a Greek nationwide study, a higher proportion of mothers in the upper socio-economic strata reported exclusive breastfeeding during the first six months (Gaki *et al.* 2009). As discussed above, it is believed that a reversal in the social gradient has occurred in recent decades, favoring women of higher social position. However, in the Perth Infant Feeding Study I and II (PIFS I and II), Scott *et al.* (2006) found no association between breastfeeding and family income (2002-2003), even though family income was a significant predictor of BF in an earlier period (1992-1993). This may be suggesting that in some places the social inequality gap might be converging. The Cyprus MoH Perinatal Survey does not include any information with regards to difference in BF initiation or exclusivity by family income or other indicator of socio-economic position.

3.5.1.7 Marital Status

Marital status has been suggested to be associated with the initiation (Scott and Binns, 1999) and continuation of breastfeeding (Gaki *et al.* 2009). While it is more likely for studies to note that married women are more likely to breastfeed than single mothers (Kaneko *et al.* 2006), some studies, including the only one from Cyprus, do not confirm this association (Isaia *et al.*, 2017). The Cyprus MoH Perinatal Survey does not include any information with regards to difference in BF initiation or exclusivity by the marital status of the mother.

3.5.1.8 Cesarean Section

Cesarean Section (C/S) is a strong predictor of BF initiation and continuation. It has been suggested that C/S is associated with a delay of initiating breastfeeding that may lead to difficulty in successfully establishing breastfeeding and therefore to premature

discontinuation (Zanardo *et al.* 2010; Prior *et al.*, 2012). The Cyprus MoH Perinatal Survey does not include any information with regards to difference in BF initiation or exclusivity by mode of delivery.

3.5.1.9 Parity

Evidence on the association of breastfeeding and parity in the literature is inconsistent. Several studies report that primiparous mothers may be more likely to initiate breastfeeding (Scott *et al.*, 2001; Manios *et al.*, 2009). However, they are more likely to discontinue breastfeeding (Kaneko *et al.* 2006; Camutdan *et al.* 2008). It is not uncommon for studies to also show that BF initiation (Tavoulari *et al.*, 2015) and premature BF discontinuation (Kohlhuber *et al.*, 2008) is more common among multiparous mothers, or report no differences by parity (Ekström, Widstrom and Nissen, 2003; Camutdan *et al.* 2008). The Cyprus MoH Perinatal Survey does not include any information with regards to difference in BF initiation or exclusivity by parity.

3.5.1.10 Breastfeeding Self-efficacy

Maternal Breastfeeding Self-efficacy has been discussed in the literature as one of the strongest predictors of BF initiation, duration and exclusivity (Dennis and Faux, 1999; Blyth *et al.*, 2004). Due to the direct relevance of this topic to the aims and objectives of this thesis, a discussion of the literature on the measurements and association of self-efficacy with breastfeeding will be provided in **Chapter 4**.

3.5.1.11 Other Determinants of breastfeeding initiation and discontinuation

Breast milk insufficiency, either perceived or real, (Thuller and Mercer, 2009; Gaki *et al.* 2009; Meedya, Fahy and Kable, 2010; Hauck *et al.* 2011; Odom *et al.* 2013; Isaia *et al.* 2017) is based on the maternal feeling that breast milk quantity is not enough to cover the infant's nutritional needs (Thuller and Mercer, 2009). This might result from infrequent feedings and/or poor BF skills and/or knowledge with regards on breast milk production but also be due to lack of breastfeeding self-confidence (Surgeon's Call, 2011). This may result to earlier introduction of complementary feeding and thereafter to earlier BF discontinuation (Bronner *et al.* 1999).

Lactation problems (breast engorgement, breast infection or abscessed, sore or cracked nipples or bleeding) that result to failure to establish breastfeeding is a very

common reason of BF cessation within the first weeks (Odom *et al.* 2013; Surgeon's Call, 2011). Other reasons cited as a significant perceived reason of BF discontinuation are return to work, consideration for breastmilk quantity, tiredness, stress, depression or household obligations including the care of other children (Gaki *et al.* 2009; Odom *et al.* 2013).

Admission to the NICU (Neonatal Intensive Care) is another barrier of BF initiation and establishment (Dennis, 2002; Scott *et al.*, 2001) due to either infant health problems or the physical separation of mother with the infant that do not allow the implementation of breastfeeding (Scott *et al.*, 2001)

Finally, previous experience (Tavoulari *et al.*, 2015; Isaia *et al.*, 2017) and intention to BF (Blyth *et al.*, 2004; Scott *et al.*, 2006; Inoue *et al.*, 2012; McQueen *et al.*, 2015) are positively associated with initiation and continuation. In fact, the timing of the decision to breastfeed is considered of high importance as it increases the likelihood to BF initiation and thus longer duration of BF (Dennis, 2002). Several studies suggested that the earlier the decision is taken the greater the likelihood of successful initiation and longer duration of BF (Dennis, 2002).

3.5.2 Interpersonal Influences

This level encompasses of the immediate home and peer environment of BF mothers. Partner and other family members' attitudes and support (Dennis, 2002; Surgeon's Call 2011), support by friends (Dennis, 2002) affect the immediate environment that determines the mother's enabling circumstances for BF initiation and continuation including time availability and maternal determination or intention to BF (Hector et al., 2005).

Partner attitudes towards BF is the most influential informal factor on mother's decision to initiate BF (Scott and Binns, 1999; Arora *et al.*, 2000; Dennis, 2002; Wolfberg *et al.*, 2004; Scott *et al.* 2006) and is considered the most important form of support (Dennis, 2002; Scott and Binns, 1999). Mothers whose partners expressed preference and supported BF were more likely to initiate and experience longer BF duration in comparison to those that reported preference to bottle-feeding or were ambivalent (Scott *et al.*, 2001; Scott *et al.*, 2006; McQueen *et al.*, 2015; Clifford and McIntyre, 2008). The Fathers Infant Feeding Initiative (FIFI) Study, a randomized Control Trial (RCT), evaluated the effectiveness of paternal education on breastfeeding. In both the intervention and the control group, the fathers' groups received the usual care provided by the participating hospitals that included a 4-week educational session composed of antenatal education program and routine hospital and postnatal care. The intervention group received an additional 2-hour antenatal educational session followed by a 6 week social support package given postnatally. BF rates were higher in the intervention group in comparison with in the control group with 81.6% vs 75.2% (OR: 1.46; 95% CI: 1.01-2.13) (Maycock *et al.*, 2013).

Perceived Maternal grandmother preference and support to BF was also associated with better BF outcomes (Arora *et al.*, 2000; Scott *et al.*, 2001; Scott *et al.*, 2006; Negin *et al.*, 2016). Like paternal, maternal grandmother preference to BF is a predictor of BF initiation (Wolfberg *et al.*, 2004; Scott *et al.*, 2006). Grandmother BF advocacy and support can be favorably influential. According to a study of qualitative design, accurate and adequate knowledge about BF practices and loving encouragement to daughters can favourably influence maternal decision to initiate BF (Grassley and Eschiti, 2008). In a systematic review of 13 studies, a positive grandmother opinion on

BF was associated with up to 12% higher possibility to influence a mother to initiate BF. On the other hand, a negative opinion by grandmother is associated with a lower likelihood up to 70% for a mother to BF (Negin *et al.*, 2016). The role of the maternal grandmothers has been substantially discussed in the literature. There is evidence to suggest that women often rely and ask for help from their mothers' help and support when they face lactation problems, even more so than health professionals (Clifford and McIntyre, 2008). Other than emotional or appraisal support, it has also been suggested that the role of the maternal grandmother pertains to tangible support. For example, women are more likely to ask for their help with the household chores in order to allow them for more time for rest and adjust to the baby' schedule (Scott and Binns, 1999).

Beyond the role of the father and the maternal grandmother, it has also been suggested that having other family members or friends that have experienced and master knowledge on BF, mothers have higher likelihood to succeed on BF practices (Scott and Binns, 1999). There is no research evidence from Cyprus with regards to the sources or impact of support on BF.

3.5.3 Organizational level

The organizational environment of BF includes maternity and other health services and the extent to which these are protecting, promoting and supporting BF. It can be argued that the cornerstone is the extent to which maternal health services adhere to the BFHIs' "10 Steps for Successful Breastfeeding", which includes the proper training of health care professionals. The role of community-based organizations and NGOs, lactation consultants, peer or lay support groups are also of paramount importance. These will be discussed in the context of the community-level resources. Of course, it has to be noted that the organizational level extends well beyond the healthcare sector (i.e. social services, educational system) and well beyond the period of pregnancy. For instance, even though there is not much empirical evidence to support their effectiveness, it has been suggested that the inclusion of BF in educational and/or training programs in school as well as university curricula (Yngve and Sjöström, 2001) contributes to the promotion of BF as the social norm and correction of misperceptions, beliefs, myths and stereotypes.

In terms of the healthcare system, it has been suggested that health care professionals' pre-service training in Europe is inadequate. For instance, only few countries provide some form of certified courses on breastfeeding or/and introduced educational curricula on BF (Cattaneo *et al.*, 2005). Specifically, it has been suggested that the educational and residency training of medical students as well as other health professionals on breastfeeding is inadequate. Health professionals are not prepared sufficiently to provide optimal care and support to expectant and breastfeeding mothers (Payne *et al.*, 2007; Bozzette & Posner, 2013). Inclusion of breastfeeding curricula in universities for health professionals improves the level of knowledge (Dennis, 2002; Feldman-Winter *et al.*, 2010), skills on BF support as well as their confidence of the management of BF-related issues (Feldman-Winter *et al.*, 2010). Furthermore, it positively motivates health professionals to promote and support BF, by changing the negative beliefs and attitudes towards BF (Payne *et al.*, 2007).

The WHO and UNICEF acknowledged the importance of pre-service as well as in-service training of health care professionals, and developed standardized training courses for HCPs in the fundamentals of lactation and Breastfeeding counseling (Cattaneo and Buzzetti, 2001). The 20-hour WHO/UNICEF course on BFHI (2009) can be used to strengthen the skills and knowledge of maternity clinic staff (WHO/UNICEF, 2009) whereas the 40-hour course focuses on the development of clinical skills for HCPs in BF counseling and support (WHO, 1993).

Whereas these resources have been available for some time, there very little research evidence on the effectiveness of the training courses (Cattaneo *et al.*, 2005). One RCT study conducted in Brazil with the participation of 60 health care professionals from 60 units, 20 to the intervention and 40 to the control group examined the effectiveness of the WHO 40-hours training course immediately after the end of the training and three months subsequently. Improvement in knowledge and counseling skills of the intervention group was evident. Participants at the intervention groups sustained high scores, with a slight reduction, after three months (Rea *et al.*, 1999), indicating that periodic and systematic training of health professionals can maintain high standards on professional support and counseling on BF. Nevertheless, the effectiveness in influencing actual breastfeeding initiation and duration rates is not known.

In a cluster randomized controlled study, Yotebieng *et al.*, (2015) suggested that basic training in the BFHI Steps can result in an increase of EBF duration at six months but

has no effect on the EBF initiation rates. Another before- and-after study provided an intensive 3-day training program to health professionals that included two samples, one pre-intervention and one post-intervention. The post intervention group of health professionals demonstrated better outcomes in terms of BF duration (Median: 16 vs 13 weeks; p-value=0.02). After controlling for potential confounders, the risk of weaning was also lower by 30% (adjusted HR: 0.70 95% CI: 1.54-0.91) among mothers who received help after the training of the health professionals than those who gave birth in the period before the training (Vittoz *et al.* 2004).

In-service training of maternity clinical staff is only one of the BFHI's "10 steps". Adherence of maternity facilities to the BFHI's practices, described in "The 10 Steps for Successful Breastfeeding", is thought to be associated with successful initiation, establishment and longer duration of BF (WHO, 1998; WHO, 2017). Since the topic of adherence to the "10 steps" is at the core of this thesis, the evidence in the international literature with regards to the implementation of the BFHI's maternity practices as well as the effectiveness of the "10 steps" on BF will be elaborated in **Chapter 4**.

3.5.4 Community Environment

This level pertains the extent to which a community considers and accepts BF as the social norm (Hector *et al.* 2005). From a population-level intervention approach, this would require BF-related behavior changes strategies that will facilitate adherence to a BF –friendly community (Sallis, Owen and Fisher, 2008; Tiedje *et al.* 2002). Successful community group-based BF programs necessitate the involvement of community organizations, community health care professionals and peer or lay support groups. An important aspect of the community-level support, especially since return to work has been cited as one of the main reasons for BF discontinuation, is the extent to which workplace are breastfeeding-friendly. Finally, the role of the media is also discussed as important (Surgeon' s Call, 2011) in the context of promoting a BF-friendly culture.

3.5.4.1 Professional and Peer or Lay Support

A large body of literature provides sufficient evidence on the importance of social support, either peer (i.e. other BF mothers), lay (i.e. non-professional volunteers) or professional community support on breastfeeding duration and exclusivity after mother's discharge from the hospital (Sikorski *et al.*, 2003; Britton *et al.*, 2007).

Peer or lay support is usually provided from volunteer community-based groups or organizations, including international organizations or local NGOs (e.g. national breastfeeding associations, mother-to-mother support groups). The first founded (1956) breastfeeding support group was La Leche League that intended to promote BF as the optimal source of nourishment for the infant with a plethora of health benefits for both the baby and the mother, through mother-to-mother support, education and encouragement (Morrow, Martin and WHO, 2003; www.llli.org). La Leche League is, now, active in many countries worldwide including the USA (<https://www.lllusa.org/>), Canada (<https://www.lllc.ca/>), Europe (<https://lalecheleague.eu/>), Africa, Asia and Latin America (<http://www.llli.org/>). A study was conducted in Guatemala to investigate the effectiveness of the La Leche League community support group. La Leche League Guatemala (LLLG) trained BF counselors to provide support to BF women at the area they reside. Even though, no significant differences at BF rates were reported between the intervention and the control group, a significant effect was observed in terms of EBF. Only 14% of mothers who did not receive either home visits

or attended the support groups (control group) exclusively breastfed compared to 45% in mothers in the intervention group (Dearden *et al.*, 2002).

In the USA, some community-based groups and organizations are focused on providing support on the basis of the cultural origin of the mother such as the African-American Breastfeeding Alliance, the Black Mothers' Breastfeeding Association (Surgeon's Call, 2011). In most EU countries, there are peer (mother-to-mother) counselling and support groups, but their geographical coverage is low to medium, except France, Scotland and The Netherlands (Cattaneo, 2004; Cattaneo *et al.*, 2005). A Cochrane systematic review and meta-analysis (Britton *et al.*, 2007) that investigated the effectiveness of lay or/ and professional social support on BF, included 34 randomized or quasi-randomized trials, conducted in 14 countries with the participation of 29,385 mother infant pairs. The overall effect of support on any BF (RR: 0.91; 95% CI: 0.86, 0.96) was beneficial, with even greater on EBF (RR 0.81; 95% CI 0.74 to 0.89). Professional community support was more effective than usual care (provided for any BF duration at least up to the four month (RR: 0.78; 95% CI: 0.67-0.91), but any effect beyond (up to the six month) was not statistically significant. In terms of EBF, the beneficial effect of professional support was evident for the period up to the first two months (RR: 0.76, 95% CI: 0.61, 0.94). Interestingly, in comparison to professional support, lay support was more effective on EBF duration (RR: 0.72, 95% CI: 0.57, 0.90) up to the six months but not BF (RR 0.86; 95% CI: 0.76, 0.98).

Antenatal classes prepare the expectant mothers for the forthcoming challenges that they might face with BF by providing them with accurate information on BF. They can be distinguished to didactic as well interaction peer support. Antenatal classes have been associated with increased duration of BF and EBF and can predict BF duration, even after formula introduction (Bouras *et al.*, 2013). However, there is evidence to suggest that participation in antenatal education classes is low (Declercq *et al.*, 2007) and the current arrangements sustain socio-economic disparities in opportunity (Baron et al 2015). Furthermore, there is an emerging literature that suggests these do not address the real learning needs of expectant parents and have been especially criticized for the pedagogical methods used [commonly, educator-led lectures, (Nolan, 2009)] .

A systematic review by Chung *et al.*, (2008) with the inclusion of 38 randomized controlled trials (RCTs) compared the effectiveness of ony pre- , only post- and

combined pre and post intervention programs. Combined pre- and post-natal interventions are more effective from individual pre- and post- intervention programs on increasing the rate of both immediate and long term any breastfeeding. Antenatal interventions were associated with higher rates of short term any BF, while post natal interventions increased short term exclusive BF. In relation with the different categories of BF (exclusivity, predominant, partial and no breastfeeding), Haroon *et al.*, (2013) conducted a systematic review that included 110 studies: 63 RCTs and 47 quasi-experimental studies. Of those, 78 investigated the effect of individual counseling on BF practices, 14 the effect of group counseling and 19 of both individual and group counseling. In relation with setting of the intervention, 21 were community based, 46 were facility based and 43 were both community and facility based. According to the findings of the systematic review, breastfeeding interventions increased EBF for infant younger than six months (by 43% at first day, by 30% up to the first month, and by 90% between 1-5 months), while formula feeding was reduced by 32% at first day, 30% at first month and 18% from 1-5 months. No association was observed in relation with partial and predominant breastfeeding. Combined individual and group interventions were more effective than the implementation of either individual or group counseling alone. Similar were the findings for the intervention setting. Combined community and facility based interventions were more beneficial on breastfeeding. When comparing the two settings, community-based were found to be more effective than facility-based interventions.

Moreover, though, it has been suggested that a group peer support (as opposed to individual) provides a social environment with BF being promoted as the social norm (Surgeon's Call, 2011). Within a BF supporting peer group, mothers are given a variety of opportunities and experiences to enhance breastfeeding self-efficacy, through the promotion of a sense of control and protection and the performance of BF practices within the feeling of security (Hoddinott, Chalmers and Pill, 2006). Mother-to-mother support and being part of a group of BF women can play a crucial role in BF continuation beyond the first weeks (Sheeshka *et al.*, 2001). In a recently published systematic review and meta-analysis (Shakya *et al.*, 2017) of 47 studies from both low-middle and high income countries, the use of community-based peer support groups was associated with improved BF outcomes. Chung *et al.*, (2008) suggested that lay support might increase any BF and EBF by 22% and 65%, respectively. The

effectiveness of community-based peer support groups was more evident in low and middle income countries than in high income countries. In a systematic review by Renfrew *et al.* (2012) with the inclusion of 52 studies (44 individually and 8 cluster randomised trials), lay support (RR: 0.85; 95% CI: 0.77, 0.93) was more effective than professional support (RR: 0.94; 95% CI: 0.88, 0.99) or combined lay and professional support (RR: 0.97; 95% CI: 0.91, 1.03).

Professional support and counseling on BF to mothers has been associated with fewer breastfeeding problems and longer BF duration (Sikorski *et al.*, 2003; Hannula, Kaunonen and Tarkka, 2008; Britton *et al.*, 2007). A systematic review with the inclusion of 31 articles conducted in developed countries and 5 reviews suggested that professional support has a positive effect on BF initiation and continuation (Hannula, Kaunonen and Tarkka, 2008). Professional support had a long term- effect on BF duration beyond six months (nine and twelve months) (Sikorski *et al.* 2003). On the contrary, Chung *et al* (2008) suggested of no significant association between professional support (formal or structured support or individual-level professional) with any BF and EBF.

Health professionals may be a negative source of information and support to breastfeeding women (Dennis, 2002). Lack of interest by HCPs to support breastfeeding mothers as well as inaccurate and inconsistent information (AAP, 1997; Dennis, 2002; Surgeon 's Call, 2011) has been attributed to lack of formal training and knowledge on BF but also on lack of confidence to resolve lactation problems (Clifford and McIntyre, 2008). Furthermore, maternal perceived negative BF experience might be associated with lack of support by the health professionals (Clifford and McIntyre, 2008).

3.5.4.2 Workplace Support

Return to work is reported as one of the common barriers of BF continuation (Thulier and Mercer, 2009; Surgeon's Call, 2011). Workplace supportive environment, including support from employers and colleagues, flexibility in work hours and breaks as well as BF facilities (breast pump, breast milk storage, dedicated room with all the facilities) can influence maternal decision on BF continuation, especially after return to work (Smith *et al.*, 2013).

Evidence suggests that the timing of returning back to work is strongly associated with BF discontinuation. Mothers are 2.2 times more likely to cease BF on the month they return to work in comparison to those that do not return to work on the same month. (Kimbrow, 2006). Another study suggested that mothers returning to work sooner than six months, cease BF (Chuang *et al.* 2010; Smith *et al.* 2013) and introduce formula two months before those that they get back to their job after six months (Smith *et al.* 2013). In a population-based cohort study, Chuang *et al.* (2010) indicated that mothers who return to work within one month after birth are less likely to initiate BF in comparison to those that did not return to work (HR: 0.71; 95% CI: 0.62, 0.80) but not with mothers that returned to work after one month (Chuang *et al.* 2010). Nevertheless, there are studies that did not find any association between return to work and BF initiation and/or duration. For instance, in the birth cohort of the Early Childhood Longitudinal Study, there was no difference between BF initiation and duration and return to work at 13 weeks or later in comparison to 1-6 weeks, after adjustment for potential maternal, infant and community confounders (Ogburn *et al.*, 2011).

In terms of the barriers and challenges after returning to work, commonly cited are breast milk insufficiency and difficulties of expressing breast milk that resulted from long mother-infant separation (Smith *et al.* 2013) mainly due to inflexibility in their working hours (Surgeon's Call, 2011; Smith *et al.* 2013; Dennis, 2002). However, the literature also suggests that other factors may be important, such as hostility from their colleagues (Thulier and Mercer, 2009; Smith *et al.* 2013) and fear of losing their job (Smith *et al.* 2013). Employment position status can also influence BF duration with mothers having a professional position being more likely to BF longer than mothers with administrative or manual professions, but not compared to stay at home mums (Kimbrow, 2006). Thus, the flexibility provided by the nature of the profession also seems to be an important factor (Johnston and Esposito, 2007). Finally, working part-time is also associated with an increased likelihood of EBF at six months than working full-time (Smith *et al.* 2013).

The need to promote workplace support to BF mothers led some countries to develop specific initiatives to provide motives to the employers in order to be supportive towards BF mothers. For example, in 2002, the Australian Breastfeeding Association (ABA) developed the evidence-based breastfeeding-friendly workplace guidelines for employers (Smith *et al.* 2013) and started the Breastfeeding Friendly Workplace (BFW)

accreditation scheme for all BF supportive companies and employers. This effort was supported by the Australian government in the context of a wider health promotion campaign as part of the National BF strategy (Smith *et al.* 2013). In the USA, similar incentives were given to employers in order to become more supportive to BF. A US national survey showed an increase in the prevalence and duration of BF among full time mothers during the last decades, and it was partly attributed to the improvement of facilities and flexibility provided in the workplace (Ryan *et al.* 2006). Research evidence with regards to the effectiveness of BF intervention programs at the workplace is very limited (Abdulwadud and Snow, 2006). There are no similar workplace schemes in Cyprus, even though the 2015 National campaign, organized by the Ministry of Health and the National Breastfeeding Committee to celebrate the 25 year since the Innocenti Declaration, had “Breastfeeding and Work: let’s make it work” as its core campaign message.

3.5.4.3 Breastfeeding in Public

In a population-based public opinion telephone survey conducted in New York, USA, 50.4% of the participants reported against of public breastfeeding and that BF is an act that should be conducted in private (Mulready-Ward and Hackett, 2014). Similar results were reported from other countries (Clifford and McIntyre, 2008; Meng *et al.* 2013; Surgeon’s Call, 2011). The main reason of suggesting that BF should be conducted in private is lack of comfort and embarrassment in the sight of a mother breastfeeding her child (Mulready-Ward and Hackett, 2014; Clifford and McIntyre, 2008) mainly from older people (Meng *et al.* 2013) and individuals with low education (Meng *et al.* 2013; Mulready-Ward and Hackett, 2014). In many cases, mothers were discouraged or stopped to breastfeed in public (Surgeon’s Call, 2011) and in some countries it was suggested that BF should be prohibited (Clifford and McIntyre, 2008).

The sense of embarrassment, discomfort and lack of confidence as well as having difficulties in finding accessible and comfortable BF facilities act as barriers for women to BF in public (Scott and Mostyn, 2003; Goldade, Nichter and Adrian, 2008; Clifford and McIntyre, 2008), who would eventually prefer to be socially isolated and restrict their outside activities (Scott and Mostyn, 2003; Surgeon’s Call, 2011) or discontinue BF (Surgeon’s Call, 2011). Even though breastfeeding in public has become more acceptable over time, it has been suggested that much work is still needed for public

BF to become the social norm (Scott and Mostyn, 2003; Meng *et al.* 2013). It has been suggested that commitment, determination and confidence facilitate maternal decision to BF in public which are cultivated by peer (mother-to mother) support (Sheeshka *et al.*, 2001). There is no research evidence from Cyprus with regards to the level of acceptance of BF in public. However, there is plenty of anecdotal evidence, commonly in the form of reports on complains by breastfeeding mothers to local NGO groups or the media who were asked to stop breastfeeding in public. A recent example, and possibly most publicized, was the case of a well-known TV presenter (Melanie Steliou), which caused a heated debate in the mass and social media (<http://gr.euronews.com/2017/07/18/kypros-melani-steliou-ithopoios-thilaze-dimosia-fotografia-facebook>).

3.5.4.4 Media and Breastfeeding Campaigns

The last decades, many countries designed mass media campaigns for BF promotion and support, on the basis of social marketing and advertising approaches (Surgeon's Call, 2011) The USDA national BF promotion campaign "Loving Support Makes Breastfeeding Work" launched in 1997 aimed to promote BF among Women Infant Children (WIC) program participants by raising the importance of the increasing of BF initiation and duration rates with the involvement of the family and friends, health care system and the community (Surgeon's Call, 2011). The campaign aimed to addresses key barriers of BF, including BF embarrassment in public places as well as lack of social and workplace support (Pérez-Escamilla, 2012). Even though, significant steps were made within a national context that improved BF health benefits awareness and familiarized mothers for seeking and have access to health services, BF constrains and barriers have not been lifted (Perez-Escamilla, 2012).

The US National Breastfeeding awareness campaign of 2004-2006 with the most popular message "babies are born to be breastfed" aimed to promote exclusive breastfeeding among first-time low –income mothers. It focused on the evidence-based health benefits of exclusive breastfeeding and was delivered to the public through health communications, the implementation of 18 community demonstration projects, the availability of phone, e-mail and website services supported with a trained specialized personnel. Even though an increase on EBF rates was reported, the campaign's goal was not achieved (Perez-Escamilla, 2012; Surgeon's Call, 2011). No

more than 25% of the expectant mothers saw a campaign announcement either on TV (6.5%), magazine (10%) or billboards ads (15.1%) (Haynes, 2007). Even though mothers living in community demonstration project areas were about 1.6 more likely to EBF up to three months (Haynes, 2007), the effectiveness of this campaign was disputed (Perez-Escamilla, 2012). In general, health communication campaigns, i.e. compaigns that prometit has been discussed that some key media, such as baby magazines refused to promote the campaign's announcements at no cost as they promoted paid advertisements for the promotion of breast milk substitutes with the formula industry spent more than 80 million dollars (Perez-Escamilla, 2012).

The Brazilian National Breastfeeding Program, an integrated BF campaign, was launched in 1980. A remarkable increase in BF duration was observed for more than eight months (from 2 months in 1975 to 10 months in 2000). Similar were the results for exclusive breastfeeding. The Brazilian National Breastfeeding Program initiated a process of scaling-up the sustainability of the success of the original campaign that involved a complex population-level intervention with evidence-based advocacy, enactment of legislation and implementation of policies, community and facility-based programs, innovative culturally appropriate campaigns and multisectoral commitment (Perez-Escamilla, 2012).

In Cyprus, a yearly event “Simultaneous Breastfeeding” is held every October by the Cyprus Association of Breastfeeding ‘Gift for Life’ to celebrate the international Breastfeeding Day. Mothers gather at different places in all cities in Cyprus and initiate simultaneous breastfeeding.

Nevertheless, there is no formal research evidence as to whether these campaigns have had any impact in changing attitudes towards breastfeeding, let alone breastfeeding rates in Cyprus. The fact that little improvement has been recorded in the initiation of breastfeeding in the last decade may suggest that their impact was negligible. Nevertheless, in the absence of any indicators for breastfeeding and exclusive breastfeeding past the 48 hours, any effect on influencing the duration of BF or EBF is unknown.

3.5.5 Policy level

Policy measures to BF promotion and protection is influential to all the environments that might support maternal decision for BF initiation, continuation and exclusivity (Hector *et al.*, 2005). Since the early 80s, the Joint WHO/UNICEF initiative to promote BF as a primary public health priority have developed international policies and strategies including the WHO International Code for Breastfeeding Substitutes (WHO; 1981), the WHO/UNICEF joint statement Protecting, Promoting, and Supporting Breastfeeding (1989), the Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding (1990) that were endorsed in the Global Strategy on Infant and Young Child Feeding (2002). The Innocenti Declaration (1990) in particular suggested the promotion of a “breastfeeding culture” and setting BF as the social norm through BF advocacy and commitment and social mobilization (Yngve and Sjöström, 2001). The strategies suggested by the Innocenti Declaration are briefly described in **Table 2.2 (Chapter 2 –Section 2.1, page 35)**. However, no studies have been conducted to provide hard evidence on the efficacy of the implementation of these policies on BF. In 2002, the need for a blueprint for Action on BF to be used as a model plan for planning and implementing actions for BF support and promotion at a local and national level (Cattaneo, 2004).

Currently, even though most of the European countries have developed national and/or local policies and/ or national recommendations, only five had considered by 2005 the inclusion of all four universally best-practice BF criteria. These criteria are: (1) Help provided on BF initiation; (2) EBF for 6 months; (3) BF continuation up two years of beyond; (4) Implementation of the BFHI’ s 10 Steps (Cattaneo *et al.*, 2005). Only 16 European countries had appointed a national coordinator and 21 had established national committees as suggested by the Innocent Declaration (Cattaneo *et al.* 2005). The role of both these authorities (national coordinator and national committee) is largely confined in advocacy, policy planning and guidelines’ development of BF (Yngve and Sjosrtom, 2001; Cattaneo *et al.* 2005). A more recent review by Bagci Bosi *et al.* (2015) reported that currently only 23 countries of the 53 WHO European Region have a national policy on infant and yound children feeding (IYCF) or a nutrition policy that also includes IYCF. No data were available for 19 countries. Futher, only 16 out of the 24 countries for which data were available had established national committee on BF or IYCF.

In Cyprus, the National Breastfeeding Committee was established in 2012. The National Strategy (MoH, 2011) was published in 2011, and the release of the National Policy (MoH, 2015) followed in 2015. The National Strategy aimed to the promotion, protection and support of BF and was based on four priority pillars – 1. Policy, Design, Management and Funding, 2. Information, Education, 3. Surveillance and monitoring System and Research. The National Policy re-iterated the need to promote education of health professionals on the BFHI's 10 steps and their implementation at clinic level, but fell short of starting the accreditation process for at least one state hospital as a Baby Friendly Hospital. Efforts are currently concentrating on this matter, while at the same time at least one private maternity clinic has announced publically that it will start the process.

In some countries, initiatives follow a more integrated approach. For example, the 2010-2015 Australian National Breastfeeding Strategy provides a framework for actions and priorities that focus on the protection, promotion and support of breastfeeding in the community. It involves the contribution of governmental and non-governmental organizations as well as the private sector for the coordination and integration of efforts in order to improve BF rates. This includes the provision of a paid 18-week parental leave that will encourage longer exclusive breastfeeding (Australian Health Ministers' Conference, 2009).

In particular, enactment of legislation that protects the rights of BF women in the workplace contributes to the enforcement and the promotion of “breastfeeding culture” by facilitating mothers to BF after their return to work. Return to work is one of the main perceived reasons of BF discontinuation sooner than the intended duration (Galtry *et al.* 2003). In 2000, the ILO Maternity Protection Convention amendments further established the rights of BF mothers in the workforce through enforcement of health and safety for both the mother and the child (International Labour Organization ILO, 2000; Yngve and Sjosrtom, 2001). Even though the legislation for working mothers only supports women with full-time formal employment (Cattaneo *et al.* 2005), full-time employed mothers are less likely to initiate BF than part-time employed and unemployed mothers (Galtry *et al.* 2003).

In Cyprus, enactment of legislation supports of an 18-week maternity leave since 2007. However, the legislation enforces paid maternity leave only for public servants and

does not make any reference to employees of the private sector or self-employed. Also, a specific provision was included in the legislation in relation with mother 's return to work, that suggested one hour of absence from work everyday for breastfeeding or infant care for the first nine months after birth. In 2017, paternal leave of two weeks within the period of the first 16 weeks after was enacted in order to enhance maternal support. Only recently, in 2018 public breastfeeding was enacted in order to protect mothers that decide to breastfeed in public without being judged or probited by others.

Maternity leave duration has been positively associated with the duration of breastfeeding. Return to work within one year has been shown to be associated with earlier discontinuation of BF (Galtry, 2003). Similarly, the First Longitudinal Survey of Babies on 21th century conducted in Japan, with the participation of about 40,000 mother-infant pairs, suggested that maternity leave < 6 months for full-time jobs (OR: 0.26 95% CI: 0.21-0.34) and no maternity leave (OR: 0.16 95% CI: 0.12-0.21) was negatively associated with exclusive breastfeeding in comparison with unemployed mothers. On the other hand, maternity leave longer than 6 months was positively associated with exclusive breastfeeding (OR: 1.14; 95% CI: 1.05-1.23) (Kaneko *et al.* 2006).

Furthermore, breastfeeding policy at the workplace might increase EBF rates. Smith *et al.* (2013) showed that EBF rates were double (61%) in workplaces where their female employees were aware of a BF policy in comparison to those that were not sure or knew of the non-presence of such policy (34%)(Smith *et al.* 2013). Even though some countries and some states in the USA enacted legislation that encourage the employers to support breastfeeding after breastfeeding women return to work, in most countries no emphasis is given on the development and implementation of BF policies at the workplace (Jonhston and Esposito, 2007).

3.5.6 Summary

Breastfeeding behavior is a phenomenon that results from a complex interplay between different BF-related determinants. These determinants function at multiple levels beyond mother-infant dyad characteristics and interrelate in such a way to define maternal decision and effort to breastfeed. At the individual level, factors associated with BF directly relate to maternal, infant or maternal-infant dyad characteristics. Maternal characteristics, either socio-demographic on one hand, such as the socio-economic status, maternal age, parity, educational attainment as well as psychosocial on the other hand, such as breastfeeding self-efficacy and intention to breastfeed, relate to the likelihood that a mother will or will not breastfeed successfully. Furthermore, breastfeeding intention, self-efficacy and behaviour is affected by intra-personal and other influences that describe the immediate home and peer environment of the mother-infant dyad. Family and friends attitudes towards BF influence either negatively or positively the maternal decision to BF. Partner's attitudes appear to be the most influential interpersonal influence on maternal BF behavior, followed by maternal grandmother. Partner's negative attitude towards BF results to mother discouragement to initiate BF while partner's positive attitudes enhance the likelihood of BF initiation and longer BF duration. Furthermore, all four forms of social support: instrumental, informational, appraisal and emotional support will shape the circumstances for BF initiation and continuation.

Beyond the inter- and intra-personal level, both community-level factors have an impact, either negative or positive, on maternal BF behavior as well as on paternal and family attitudes towards BF. Different aspects of the community environment interact with and determine maternal BF behavior either directly or indirectly by influencing both family and peer environment attitudes towards BF. Peer (mother-to mother), lay and/or professional support (alone or in combination) have been shown to positively affect BF outcomes. According to the literature, the main perceived maternal reason of premature BF discontinuation is insufficient BF production (Thulier & Mercer, 2009; Odom). This might be due to the lack of knowledge about the physiology of breastfeeding and/or adequate or appropriate professional support, which might result to a perceived maternal inability to overcome potential BF difficulties. In addition, a

BF-supportive workplace environment can provide supplementary social support and thus enable mothers to achieve their BF targets, after BF mothers return to work. Lack of BF facilities, or employer and peer support in the workplace, on the other hand, can potentially negatively interact with BF process leading to BF discontinuation. This might explain the fact that return to work is among the most important reasons for premature BF (Dennis, 2002; Thulier & Mercer, 2009). All these factors may be viewed as community-level determinants of BF acceptance, support and promotion and generally represent characteristics of a BF-friendly community BF in public might be considered both as an outcome as well as an indicator of a BF-friendly community.

At the core of the organizational level, the main determinant of BF is the extent to which maternity care facilities are baby-friendly. The baby friendly hospital initiative has been the cornerstone of BF policies of international and national organizations and agencies. It is mainly operationalized as the degree of implementation of a series of good practices, the so called “10 Steps to Successful Breastfeeding”. This is the topic of the next Chapter, as it relates directly to the aims of this thesis.

Finally, the development and implementation of policies and strategies as well as the enactment of laws shape the context in which all the other levels of the ecological model operate and interact with each other. The enforcement of legislation in both workplace and the community protects BF through the protection of the rights of BF mothers and the child human right for optimal nourishment. It further facilitates the actual implementation of policies such as the BFHI and the Global Infant and Young Child Strategy through the establishment, promotion and monitoring of BF-friendly practices across maternity care facilities as well as BF-friendly environments across workplaces and communities.

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Table 3.7: Factors associated with BF promotion and support within the contextual approach of the Social Ecological Model

Level	Determinants within each Level of Social Ecological Model
Intrapersonal	Maternal Characteristics attributed to determine BF outcomes • Sociodemographic factors: Education attainment, maternal age, parity-small family, ethnicity, employment status, gender of the child • Psychosocial factors: BF self-efficacy, BF literacy • Lactation problems and BF skills and techniques (e.g. latching, correct baby holding and positioning) • Smoking, maternal body weight
Interpersonal	• Active and positive Paternal BF support (attending antenatal BF classes; being involved in the procedure of BF) • Active and positive maternal grandmother support • Friends and others that experienced BF and succeeded
Community	• Peer to peer and lay support and counseling (mother to mother) programs/ HCPs/ formal support: providing services and help to mothers facing difficulties on BF, Educational and training programs for fathers/ grandmothers/ Families • Set BF a cultural norm- mother-to-mother support and empathy • Workplace supportive environment • BF-Friendly public places • Media
Organizational	• NGOs: educational seminars, BF promotion and support events including Global BF Day, • Schools/ Universities: education and training of all BF-related HCPs (Physicians, midwives, nurses, dietitians/nutritionists) • Maternity Facilities: Implementation of the BFHIs 10 Steps, education of HCPs • BF surveillance/ Research
Public Policy	Policies and laws that regulate or support prenatal, perinatal and child health care • BF Promotion and Support Policies (Innocenti Declaration, IBCS, BFHI)- National Co-ordinators and National BF committees • BF Workplace Support Policies and Legislation (ILO Maternity Protection Convention)-Maternity Leave, Reduction or flexibility of working hours/ frequent breaks for nursing • Inclusion of BF in school/ university curricula • Appoint National BF coordinator and establish National BF committee - HCPs' training curricula, national BF guidelines,

Source: Yngve, A. and Sjöström, M., (2001) *Public health nutrition*.

Chapter 4:

The 10 steps for successful breastfeeding

This chapter provides a description of the aims of the Baby-Friendly Hospital Initiative (BFHI) (**Section 4.1**), with a focus on the “10 steps for Successful Breastfeeding” (**Section 4.2**). Furthermore, the chapter presents evidence from the international literature with regards to the level of the implementation of the BFHI (**Section 4.3**) as well as evidence on the extent to which the implementation of the 10 Steps are effective or are associated (from intervention and observational studies respectively) with improved BF initiation, exclusivity and duration (**Section 4.4**).

4.1 The Baby Friendly Hospital Initiative

The joint WHO/UNICEF *Baby Friendly Hospital Initiative* (BFHI) was launched in 1990 as one of the main components of the Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding. It is an international program which aimed in the improvement of maternity care services, mainly focusing on the adherence of maternity care facilities to “good practices” and specifically the implementation of the “*Ten Steps to Successful Breastfeeding*”. The “10 Steps” are the underpinning of the BFHI and describe the optimal maternity practices for supporting mothers to initiate breastfeeding.

In 2002, the “*Global Strategy for infant and Young Child Feeding*” reaffirmed the goals of the *Innocenti Declaration* and considered the BFHI as one of its main operational targets. Furthermore, it acknowledged the lack of progress and the urgency to support exclusive breastfeeding up to the sixth month of any infant’s life and continued BF with timely and appropriate complementary feeding for two years or longer (Saadeh, 2012). Only recently, the BFHI programme was reinvigorated since it was first launched in 1989. The updated implementation guidance targets the policy makers and the institution managers at different levels to fulfill nine responsibilities through a national BFHI programme. These are (1) the integration of the 10 Steps into the national policies, (2) establishing or strengthening a national coordination body, (3) ensuring the capacity of all health care professionals, (4) the use of external assessment to regularly evaluate the implementation of the 10 Steps, (5) providing technical assistance, (6) monitoring of the implementation, (7) continuous

communication and advocacy, (8) identification and allocation of sufficient resources and (9) incentivizing change. (WHO/ UNICEF, 2018)

4.2 BFHI designation and the “Ten steps”

A maternity facility is awarded with the designation of Baby-Friendly Hospital when it follows the Global Criteria of the BFHI that were set as the standards for measuring adherence to the 10 Steps for Successful Breastfeeding. The Global Criteria provide guidance on the procedure that maternity care facilities have to undergo in order to be assessed and acquire certification as Baby-Friendly. In 2009, BFHI documents were revised and updated instructions and guidance required for the successful implementation and compliance to the “10 Steps” and the International Code of Marketing of Breast milk substitutes were offered (WHO/UNICEF, 2009). **Table 4.1** below lists the “10 Steps for Successful Breastfeeding”. Also, **Figure 4.1** presents graphically the infographics used in the context of the BrEaST start in life to represent each of these steps as a chain. These were used on all infographic and other dissemination material that were developed.

A BFHI Self-Appraisal Tool (Section 4) of the ten steps is included in the BFHI package. This tool was developed in order to be used by the maternity care facilities as a means of a preliminary self-assessment of the extent to which they implement the 10 Steps. The self-assessment of maternity care practices which affect successful breastfeeding provides a framework by which a maternity care facility can identify gaps in the implementation to design potential and necessary improvements and modifications. The process follows a triple-A sequence (Assessment, Analysis, Action). For a maternity facility to acquire the baby-friendly accreditation, it should demonstrate at least 80% compliance to all the maternity practices/ Global Criteria as described in the “*Baby-Friendly Hospital Initiative: Revised, Updated and Expanded for Integrated Care*” guide (WHO/UNICEF 2009). Accreditation is followed by periodical, predefined re-evaluations to assess to the facility’s compliance to the Ten Steps.

Table 4.1: *The Ten Steps for Successful Breastfeeding*

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1. *Have a written policy that is routinely communicated to all health care staff*
 2. Train all health care staff in the skills necessary to implement this policy.
 3. Inform all pregnant women about the benefits and management of breastfeeding.
 4. Help mothers initiate breastfeeding within one hour of birth.
 5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
 6. Give infants no food or drink other than breast-milk, unless medically indicated.
 7. Practice rooming in - allow mothers and infants to remain together 24 hours a day.
 8. Encourage breastfeeding on demand.
 9. Give no pacifiers or artificial nipples to breastfeeding infants.
 10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or birth center.
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Source: WHO/ UNICEF: Baby-Friendly Hospital Initiative: Revised, Updated and Expanded for Integrated Care (2009)

Figure 4.1: Infographics developed and used in the context of the BrEaST start in life representing the 10 Steps as a chain



4.3 Current Status of the BFHI globally

Since the BFHI was launched, as many as 21,328 maternity care facilities that have been listed as ever been designated as Baby-Friendly in 131 (out of 198; 66%) countries (Labbok, 2012). These represent 27.5% of the all maternity clinics worldwide, ranging from 8.5% in devepoled countries to 31% in less developed settings (Labbok, 2012).

Recently, the WHO (2017) published an updated report to celebrate the 25th Anniverarsy since the launch of the initiative. The report provides an analysis of the current status of the BFHI worldwide. Among others, the report describes the global and country program coverage⁵, the current designation process as well as reasons of discontinuation of the program in countries that reported its termination. Results of this Report were derived from 2nd Global Nutrition Policy Review (GNPR2) which was distributed to all 194 WHO member states in 2016. The members were requested to ask a series of questions in relation with the implementation of the BFHI. A total of 117 countries completed the questionnaire included in the GNPR2. WHO also obtained information from other sources for countries that did not respond or provided no coverage information to the GNPR2. The additional sources included the 2016 BFHI Network for Industrialized Countries, the 2014 American Health Organization survey on BFHI Implementation in Latin America and the Caribbean, the 2013 UNICEF Nutridash survey. Further, WHO contacted a series of interviews with national leaders in breastfeedign programmes and the BFHI in order to receive additional qualitative information of the BFHI (WHO, 2017).

According to the report, 86% of the countries that completed the questionnaire reported that they implemented the BFHI . Overall, 71% reported that they have an operational BFHI program. The BFHI was introduced by almost half (48.8%) of the participating countries in the early 90s, whereas eleven (9.4%) and eight countries (6.8%) have initiated the implementation of BFHI in the period 2000-2009 and 2010-2017 respectively. As many as 16 countries report that they had never implemented the program and for a further 25 countries the year when the program was actually introduces is not reported (WHO, 2017). Of the 78 with an active BFHI programme that completed the GNPR2 questionnaire, the majority of countries (N=61; 78%) used the Global Criteria for the assessment of maternity

⁵ BFHI Coverage is the proportion of births that occur in Baby-Friendly designated maternity facilities (as defined by the Global Nutrition Monitoring Framework)

facilities in BFH- designation process. Twenty one percent (n=16) used their own national criteria. **Table 4.2** presents some of the main statistics reported in the Report (WHO, 2017) with regards to the progress and current status of the BFHI countries globally 25 years after the launching of the Initiative.

Table 4.3 reports the overall percentage of births that occurred in Baby-Friendly designated hospitals by each WHO region, as well as the number of countries per region on the basis of BFHI coverage (e.g. None through to >50% of births occurring in BFH). Overall, BFHI coverage was estimated at about 10%, ranging from less than 5% in Africa and Southeast Asia to 36% in the European region (WHO, 2017). However, significant between-country variability is observed, even within the European region. Only twelve (out of 47) countries in the WHO European region report that births in baby-friendly designated hospitals exceed 50%, whereas as many as 16 countries report of no BF designated facilities.

Table 4.2: *Number of countries that reported implementation of the BFHI by year of introduction*

Year	Number of Countries (%)
Never Implemented	16 (13.7)
< 1995	34 (29.1)
1995-1999	23 (19.7)
2000-2004	8 (6.8)
2005-2009	3 (2.6)
> 2010	8 (6.8)
Unknown year	25 (21.4)

Source: WHO (2017), *National Implementation of the Baby-Friendly Hospital Initiative*

Among the participating countries, only 64 have reported that the “10 Steps for Successful Breastfeeding” has been incorporated into national policies or strategies. Only 39 countries (50%) reported having developed a reassessment process. Most of those (N=21) reassessed the BF maternity facilities less frequently than five years and only 14 countries reported that they reassess facilities every five years (WHO, 2017).

In 2016, 23 countries reported that they had terminated the implementation of the BFHI. Among those, eight countries ceased its operation before 2005, seven countries stopped the use of the program during the period 2006-2010 and five stopped its implementation within the last five years (WHO, 2017). The most frequently reported reason of BFHI programme cessation was the termination of external funding (given by 12 countries), followed by the lack of human resources (given by 7 countries), and lack of political interest (given by 8 countries). Other reasons mentioned were the termination of governmental funding (given by 5 countries) and resistance from hospitals or health care system (given by 5 countries). The least common reasons included merging with other programmes, lack of advocacy, lack of monitoring and non-adherence of the ICMBS. (WHO, 2017)

Table 4.3: *Percentage of births that occur in facilities BF-designated maternity facilities by WHO region and number of countries on the basis of the % BFHI coverage*

Area	% of Births	No of countries on the basis of % BFHI coverage				
		None	< 20%	20-50%	>50%	Total
Africa	4	15	13	5	2	35
Americas	13	10	16	1	3	30
Easter Mediterranean	17	8	8	4	1	21
Europe	36	16	9	10	12	47
Southeast Asia	3	5	4	0	2	11
Western Pacific	11	9	7	4	4	24
Total	100%	63	57	24	24	168

Source: WHO (2017) National Implementation of the Baby-Friendly Hospital Initiative

4.4BFHI Status in Cyprus

The Cyprus National Committee for Breastfeeding, Ministry of Health released the National Strategy for Breastfeeding in 2011 followed with the release of the National Breastfeeding Policy as recently as in 2015. Both documents are available from the website of the Cyprus Ministry of Health (www.moh.gov.cy, only in Greek). The Policy includes a call to launch the Baby-friendly Hospital Initiative, as currently, no hospital in Cyprus is designated as baby-friendly (WHO, 2017). According to anecdotal reports, one state hospital and one private maternity clinic are currently undergoing a self-assessment as part of the process to apply for designation status.

The Cyprus National Breastfeeding Strategy (2011) was developed on the basis of four major pillars to strengthen and ensure the protection, promotion and support of BF. The first pillar “Policy, Design, Management and Financing” focuses on the development of a complete Breastfeeding Policy on infant and young child feeding. The second pillar “Information, Education, Training” focuses on the provision of adequate and accurate and complete information and education on infant feeding. The third pillar “Surveillance and Monitoring System” engages on the development of a surveillance and monitoring system to ensure BF rates recording and monitoring. The fourth pillar focuses on the promotion of research on BF in relation in the current BF practices, the determinants of BF as well as effectiveness of BF interventions.

The National BF Policy (2015) aims to the promotion of BFHI through the implementation of the 10 Steps in the maternity facilities in Cyprus. It reaffirms the importance and need of adherence to the 10 Steps, emphasizing on each of the Steps. However, it falls short to measures or incentives for maternity care facilities to introduce policies at facility-level or support education initiatives for health professionals, which are the practices that are fundamental to the adherence of the other that will ensure successful BF initiation and continuation.

Besides some research data on the knowledge and practices of midwives in public obstetric units in the promotion of BF (Panayiotou, 2012), assessment of adherence to the ten steps has never been officially (by the Health Services) or unofficially (as part of a research study) conducted in the maternity clinics in Cyprus. However, the Panayiotou (2012) study shows that there is considerable heterogeneity in staff practices in maternity hospitals, which causes insecurity and confusion for the mother with an increased chance of failure to breastfeed. At the same time, it should be noted that a pilot study, which preceded the largest study, reported

a relatively low implementation of the "10 steps" in Nicosia units based on the self-assessment of the Head / Chief of Unit / Clinic.

4.5BFHI Status in Greece and other countries

Greece initiated the implementation of the BFHI in 2011, even though no national strategy or policy has been developed yet. Currently, there are five baby-friendly designated facilities. Nevertheless, only 4.7% of annual births occur in these facilities (WHO, 2017).

Among the countries ranked at the lowest positions in relation with the proportion of annual births in BF designated hospitals were developed countries with the highest BF rates, such as Sweden and Finland with 0% and 8.2% of annual births in designated hospitals. Similarly, Norway reported of no annual birth in designated hospitals. On the contrary, in Ireland that ranks amongst the countries with lowest BF rates in Europe, almost half of the annual births were given in BF designated hospitals. New Zealand ranks at the highest positions in relation with the proportion of annual births in designated hospitals with 99.6 % with all (100%) of their maternity hospitals being ever being designated as BF. Significantly high proportions of annual births in BF designated hospitals were reported in countries such as Sri Lanka with 100%, Slovenia with 84.3%, Ukraine with 75.2% and Kazakhstan with 64.5%.

Table 4.4 presents interesting statistics from the WHO report in terms of the % births in BF designated hospitals as well as other indicators of the implementation of the BFHI across select countries worldwide.

Table 4.4: *National Coverage of Baby-Friendly Designated Maternity Facilities in select countries*

Country (Year of Implementati on)	% births in BF designated hospitals/m aternities (Year of estimate)	Reported % of designate d hospitals/ materniti es	% of ever designat ed hospitals / maternit ies	Implement ation BFHI §	Ten Steps integrated into national and quality standards	Ten Steps integrat ed into national policies, strategie s, plans
Australia (1992)	20 (2016)	NS	NS	Currently	No	All
Austria (1996)	15 (2014)	NS	NS	Currently	No	NS
Belgium	9.4 (2016)	NS	26	Currently	No	NS
Canada	0.0 (2016)	NS	2	Currently	NS	NS
Cyprus (2015)	0.0 (2016)	NS	0	Currently	No	All
Finland	8.2 (2016)	NS	19	Currently	NS	NS
France	5.0 (2016)	NS	NS	Currently	NS	NS
Greece (2011)	Not reported	NS	4.7	Currently	No	No
Ireland (N/A)	43.0 (2016)	NS	NS	NS	NS	NS
Italy	5.7 (2016)	NS	NS	NS	NS	NS
Japan (1991)	3.8 (2016)	NS	3	Currently	Some Steps	Some Steps
Kazakhstan	64.5 (2014)	NS	NS	NS	NS	NS
Kyrgyzstan (2000)	45.2 (2016)	NS	35	Currently	All	All
Lithuania (2004)	40.4 (2016)	NS	29	Currently	No	No
Luxembourg	16 (2016)	NS	NS	NS	NS	NS
Brazil	23.4 (2016)	NS	10	Currently	No	NS
Germany	19.6 (2016)	NS	NS	NS	NS	NS
Finland	8.2 (2016)	NS	19	Currently	NS	NS
Malaysia (1992)	75.3 (2016)	NS	5	Currently	No	All
New Zealand (late 1990s)	99.6 (2016)	NS	100	Currently	All	No
Netherlands (1996)	39.5 (2016)	NS	43	Currently	No	No
Slovenia	84.3 (2016)	NS	86	Currently	No	No

Country (Year of Implementati on)	% births in BF designated hospitals/m aternities (Year of estimate)	Reported % of designate d hospitals/ materniti es	% of ever designat ed hospitals / maternit ies	Implement ation BFHI §	Ten Steps integrated into national and quality standards	Ten Steps integrat ed into national policies, strategie s, plans
Sri Lanka (1992)	100.0 (2016)	NS	1	Currently	All	All
Sweden	0.0 (2016)	NS	73	Currently	NS	NS
Ukraine	75.2 (2016)	NS	NS	NS	NS	NS
Turkey (1991)	NS	90.4	NS	NS	NS	NS
Norway (1993)	0.0 (2016)	NS	93	Currently	All	All

§ NS: Not Stated; **Source:** WHO (2017), *National Implementation of the Baby-Friendly Hospital Initiative*

4.6 Evidence on the degree of implementation of the “10 steps” and association with breastfeeding

While the original development of the 10 steps was based on clinical experience and good public health practice rather than research evidence in terms of their impact in influencing breastfeeding behavior and outcomes (WHO, 2017), there has been plenty of research evidence since to support the positive association (in observational studies) and/or effectiveness (in intervention studies) of the adherence to BFHI’s 10 Steps to Successful Breastfeeding on BF outcomes. This section describes available evidence in terms of the degree of implementation of the “10 steps (Section 4.6.1) followed by evidence on the association or effectiveness of the cumulative impact of the 10 steps and/or individual steps on BF duration, continuation and exclusivity (Section 4.6.2).

4.6.1 Degree of implementation of the “10 steps

Generally, studies conducted to evaluate the impact of Baby Friendly accredited hospitals demonstrated higher breastfeeding initiation and longer breastfeeding duration (Philipp *et al.*, 2001; Broadfoot, 2005; Brodribb, Kruske and Miller, 2013). However, suboptimal implementation the “10 Steps” has been reported in many countries worldwide (DiGirolamo, Grummer-Strawn and Fein, 2001; Theofilogiannakou *et al.*, 2006; Chien *et al.*, 2007; Pincombe *et al.*, 2008; Chalmers *et al.*, 2009), including Cyprus as part of the BrEaST start in life project (Hadjiona *et al.* 2016).

Recording and assessment of the current situation in relation with the implementation of the “10 Steps” in maternity facilities is usually done at a unit level (by the answers provided from the heads/ manager of the facilities) and less frequently from the of the perceived assessment of the facility personel (Panayiotou, 2012; Grizzard *et al.*, 2006; Haiek LN, 2012). Relatively limited, seems to be the number of studies conducted to investigate the implementation of the Steps through the experiences of mothers (Haiek LN, 2012; Abul-Fadl *et al.*, 2012).

The Maternity Experiences Survey in Canada (Chalmers *et al.* (2009)) is one of the largest studies in the literature that assessed the implementation of the 10 steps based on the self-reported experience of a nationally representative sample of over 8000 women, who gave birth during 5-14 months prior to the study. The study reported that the implementation of the 10 steps was fragmented with highest degree of implementation for Step 3 (information about the benefits and management of breastfeeding) and Step 10 where as many as nine out

of ten mothers were given information about where to seek help and support after discharge from the hospital. On the other hand, only 1 in 3 mothers experienced skin-to-skin and 44.4% reported that their infant was given a pacifier or a soother within the first week after birth. In a Greek study with the participation of 312 mothers, the majority of the participants (90%) reported that their babies were fed with formula whereas only 3% initiated BF within 1 hours. About 66% of mothers reported rooming-in during their stay in the hospital, of whom all gave birth in a public hospital (Theofilogiannakou *et al.* 2006).

4.6.2 Evidence from observational studies

During the last decades, there have been numerous studies from several parts of the world during the last decades that have looked at the association of either the overall implementation (e.g. comparing BF designated and non BF designated hospitals) or partial/select implementation of the 10 steps on BF initiation, duration and exclusivity. The body of literature is extensive. **Table 4.5** presents characteristics of observational studies that investigated the effectiveness of the 10 Steps on BF outcomes (Murray, Ricketts and Dellaport, 2007; DiGirolamo, Grummer-Strawn and Fein, 2008; Perrine *et al.*, 2012). Overall, the findings of these studies have consistently demonstrated positive associations of the baby-friendly maternity practices on breastfeeding outcomes.

4.6.2.1 BF rates in BF-designated and non BF-designated maternity facilities

This subsection provides evidence of the effect of the BF-designation to maternity care facilities (overall effect of the 10 Steps to Successful BF) on BF outcomes. Studies commonly either compared BF and non-BF designated maternity care facilities (Broadfoot, 2005; Bartington *et al.*, 2006) or compared change in select breastfeeding indicators pre- and post-introduction of BF certification (Duyan-Camurdan *et al.* 2007).

An example of the second type of study design is the study by Duyan-Camurdan *et al.* (2007) that assessed EBF before and after the implementation of the BFHI in a University hospital in Turkey. They found that there was a 1.5-fold increase in BF duration with a mean of 21.17 (SD: 0.42) months in the after BFHI group compared with 17.83 (SD: 0.6) months in the pre-BFHI group. Even though the authors found higher EBF rates during the post BFHI implementation period, the differences were not statistically significant.

In a survey conducted in all Scottish maternity clinics with the inclusion of 464 246 records of infants born during the period of 1995-2002, mothers who gave birth to a Baby Friendly

Hospital were about 28% more likely to initiate breastfeeding within the first week after birth after controlling for the potential effect of confounders (Broadfoot, 2005). Similar findings have been reported in other studies in terms of initiation (Broadfoot *et al.* 2005; Mydlilova *et al.* 2009). However, unlike breastfeeding initiation, evidence with regards to overall BF duration is conflicting. Whereas several studies have shown a positive effect on BF duration (for example, Merewood *et al.*, 2003; Brodribb, Kruske and Miller, 2013), a number of studies did not identify a positive association with longer duration of breastfeeding (Bartington *et al.*, 2006). For instance, in the Millenium Cohort study in UK with the participation of 17359 mother-infant dyads from 248 maternity care facilities, of which 14 were BF designated reported higher breastfeeding initiation in accredited BFHI hospitals. Nevertheless, this difference was no longer evident by the first month (adj RR: 0.96 95% CI: 0.84, 1.09).

In a different study from the US, with the participation of 29 of a total of 32 BF designated hospitals, mean breastfeeding initiation rates were significantly higher in comparison to the overall US BF initiation rates (83.8% vs 69.1%). In addition, mean EBF initiation rates were almost twice higher than the national EBF rates (78.4% vs 46.3%). Interestingly, though, the study identified existing inaccuracies in EBF definitions as well as the lack of EBF data recording even in BF-designated hospitals. Only 16 BF hospitals (out of 29 that participated in the study) kept a record of EBF data, and of those only nine reported using the WHO definition for EBF (only breast milk). Six hospitals considered infants to be EBF even they have also received sugar water for medical reasons and one hospital defined EBF on the basis of maternal perspective on supplementation i.e. infants fed with formula or sugar water for medical reasons were also considered as EBF. According to the hospitals' responses, Steps 3 (*Prenatal Information*), 6 (*only BM*) and 9 (*no use of pacifier or other teats*) were the most difficult to implement. Only a very small number of hospitals, specifically 4 out of 29, reported no problem on the implementation of the 10 Steps (Merewood *et al.* 2005)

Implementation of the BFHI also appears to have a positive effect on BF rates in NICUs. Based on extracted data from medical records of infants born and admitted in the NICU of a BF-hospital designated in the USA, Merewood *et al.* (2003) compared BF outcomes before the initiation of the procedure for the designation and after the hospital received the certification. The study reported that both BF and EBF initiation as well as duration during the first six weeks increased significantly.

4.6.2.2 Association between the 10 Steps and BF outcomes

In a population-based study in the USA, (Murray, Ricketts and Dellaport, 2007) identified that the five practices with the strongest association with BF duration within the first 16 weeks independently of maternal socio-economic status, were: (1) initiation of BF within the first hour, (2) only breast milk (exclusive BF), (3) rooming-in, (4) no use of pacifier and (5) BF support after discharge. No association was found between the maternity practices that refer to Hospital staff providing support and information to mothers on breastfeeding (*information given on BF* (step 3); *Help given on how to BF* (Step 5); *BF on Demand* (Step 8); *No gifts or samples of BF substitutes* (ICBS)), suggesting that the type of information and support might not differ. On the contrary, BF duration was higher among mothers that experienced the following steps: *BF within the first hour after birth* (Step 4); *only BM while in the maternity clinic* (Step 6); *Rooming-in* (Step 7); *No use of a pacifier* (Step 9) compared to those that they did not. When the effect of the implementation of the five maternity practices was investigated on the basis of their Socio-economic status (defined as mothers whose incomes $\leq$ 185% of the poverty level and those whose incomes were $>$ 185 the poverty level), low income mothers reported higher BF rates between 1 and 14 weeks among those that experienced all five maternity clinics compared to those that did not (65% vs 46%). For mothers above $>$ 185 the poverty level, BF rates among those that experience all maternity practices were significantly higher than those that did not between 9-12 weeks (at 12 weeks: 82% vs 70%).

In a longitudinal study (Infant Feeding Practices Survey) in the USA, DiGirolamo, Grummer-Strawn and Fein (2001) measured five indicators, thought to negatively affect breastfeeding outcomes to reflect the lack of implementation of good maternity care practices as described in the 10 steps, namely late BF initiation, introduction of supplementation, not rooming-in, not breastfeeding on demand, use of pacifiers. These were directly assessed by mothers who initiated breastfeeding during their stay in the maternity clinic and expressed the intention to BF for at least 2 months during pregnancy. The findings suggested a clear dose-response relationship between maternity practices and the risk of BF discontinuation before the first six weeks of birth. In fact, the fewer the number of “good practices” the mothers experienced during their stay, the higher the risk of BF discontinuation. Specifically, mothers who reported that they did no experience any of the maternity practices were nearly eight times more likely to discontinue BD prematurely by comparison to those who reported experienced all of the above five practices/steps (adjOR: 7.7; 95% CI: 2.3-25.8). When each “bad

practice” was assessed separately, three of the five steps appeared to be more strongly associated with shorter BF duration; late BF initiation, supplementation and no BF on demand. After adjustment for other variables, late BF initiation and supplementation were identified as the stronger risk factors of early BF discontinuation. Mothers who experienced none of the maternity practices were about seven times more likely to discontinue BF within the first six weeks in comparison to those experienced all five practices. Among the factors that were found to be independently associated with discontinuation of BF before the sixth week are late Initiation of breastfeeding (adj OR: 1.6; 95% CI: 1.1-2.3); formula supplementation (adj OR: 2.3; 95% CI: 1.5-3.3) and not BF on demand (adj OR: 1.2; 95% CI: 0.8-1.7). On the other hand pacifier use (adj OR: 1.0; 95% CI: 0.7-1.4) and rooming-in (adj OR: 1.1; 95% CI: 0.8-1.7) were found not to be associated with BF discontinuation.

While there is clear evidence to suggest that the use of supplementation is one of the strongest independent risk factor of exclusivity as well as shorter BF duration in general, it has been suggested that even baby-friendly designated hospitals fail to achieve its implementation. The Baby Friendly requirement that the maternity clinics have to pay for the infant formulas, especially in countries that hospitals receive formulas from the companies for free, increases significantly the maternity clinics’ expenses and becomes a barrier to the adherence of Step 6 (*Only BM*) (Philipp *et al.*, 2001).

In a more recent Swiss study, Merten and Ackermann-Liebrich (2004) also confirmed the positive association between the implementation of BFHI and exclusivity as well as longer breastfeeding duration. While an improvement in BF and EBF rates was observed after accreditation of hospitals with the baby-friendly designation during 1994-2004, the authors observed significant variability in EBF rates as well as the degree of meeting the BFHI criteria, even among hospitals that acquired the designation. In the study, the authors reported that the strongest associations with shorter BF duration were observed in terms of formula supplementation in the maternity facility. Moreover, the introduction of other liquids (not formula supplementation) was also associated with early cessation of BF. BF within the first hour after birth, full rooming-in, breastfeeding on demand and no use of pacifiers were shown to be associated with longer BF and EBF duration.

A survey in Brazil, as part of an immunization campaign (Venancio *et al.* 2011) included 65936 infants younger than one year of age and examined the association of the implementation of Baby-Friendly practices on breastfeeding outcomes. A higher proportion of mothers who delivered in a Baby-Friendly Hospital were more likely to experience the 10

Steps. The experience of the 10 steps was shown to have a positive association with the duration of EBF up to the sixth month. Similar findings are confirmed by a series of studies from other countries (Braun *et al.* 2003; Merten, Dratva and Ackermann-Liebrich, 2005). It has been suggested, however, that mothers who intend to BF longer or exclusively are more likely to choose to give birth to a Baby-Friendly hospital and are more willing to comply with the 10 Steps; hence, to some extent to which the observed differences represent a selection bias is not clear. (Merten, Dratva and Ackermann-Liebrich, 2005).

In any case, there is evidence to suggest that any effect is likely to be cumulative as the more “good practices” mothers experience the more likely they are to achieve EBF intentions (Perrine *et al.*, 2012). Findings from the Infant Feeding study II in the USA suggest that experiencing all six practices investigated [*Initiate BF within one hour after birth* (Step 4); *only breast milk* (Step 6); *Rooming-In* (Step 7); *BF on Demand* (Step 8); *Use no Pacifier/ Teats* (Step 9); *Provide information on how to seek support after discharge* (Step 10)] increases the odds of achieving the mother’s intended duration of EBF by nearly three times in comparison with experiencing none or only one (Perrine *et al.* 2012). Furthermore, compared to mothers who experienced all six baby-friendly practices, mother that had not experience any of the practices were at 13 times greater risk to discontinue any BF (DiGirolamo, Grummer-Strawn and Fein, 2008). The implementation of any additional baby-friendly practice, a stepwise decrease of the risk was observed, suggesting a dose-response relationship between the number of the Steps and breastfeeding. Using logistic regression analysis in order to implement mutual adjustment between the maternity practices [(*BF initiation within one hour*(Step 4); *only BM given* (Step 6), *Rooming in* (Step 7), *BF on Demand* (Step 8); *No pacifiers given* (Step 9); *Provide information on BF* (Step 10) as well as to adjust for several socio-demographic factors (e.g. child gender, household income, marital status, parity, maternal education) and behavioral and attitudinal (e.g. number of friends and relatives who breastfed, maternal prenatal intentions to work after birth, prenatal attitudes towards BFi.e formula as good as BM) factors, the authors identified the three practices with the strongest positive association with BF outcomes in the first six week period after birth. These are: BF initiation within 1 hour, only breast milk given and no pacifiers or other soothers.

Another study by Tarrant *et al.*, (2011) conducted in four Public hospitals in Hong Kong with a sample of 1242 mother-infant pairs investigated the effect of six maternity practices on breastfeeding duration up to the first month after birth. The maternity practices not

investigated were: *Have a written BF policy* (Step 1), *Train health workers to implement the policy* (Step 2), *Inform all pregnant women about the benefits and management of BF* (Step 3) and *Support mothers on how to BF* (Step 5). Mothers who did not experience any of the good maternity care practices were about three times more likely to initiate weaning within the first eight weeks (AdjOR: 3.13; 95% CI: 1.41-6.95). In order to identify the practices that are more strongly associated with successful breastfeeding outcomes there authors performed a multivariable analysis. Only four of the six maternity practices investigated were associated with BF discontinuation at 8 weeks after adjustment for sociodemographic factors, mode of birth, return to work and other breastfeeding support factors. These are early BF initiation within 1 hour after birth (AdjOR: 0.65; 95% CI: 0.51-0.83), only breast milk (AdjOR: 0.47; 95% CI: 0.35-0.63), no use of a pacifier (AdjOR: 0.66; 95% CI: 0.53-0.83), breastfeeding information and support (AdjOR: 0.67; 95% CI: 0.52-0.88). The study did not find any association between rooming-in (AdjOR: 1.13; 95% CI: 0.89-1.43) and breastfeeding on demand (AdjOR: 1.01; 95% CI: 0.78-1.31) and BF duration. When in the multivariate model, breastfeeding support variables (whether the mother BF as an infant, previous BF experience and paternal preference to BF) were also included, only EBF while in hospital stay (Step 6) was associated with BF duration.

It has to be noted that the majority of studies operationalize the extent to which the “10 steps” have been implemented based on self-report of the mothers. Furthermore, even though the set of good practices refer to 10 items, the first two items (i.e. written policy and education of maternity clinic staff) are almost always never included in the investigation since these are clinic-level rather than individual-level variables and, unlike other steps (for example, breastfeeding within one hour of birth, rooming-in, breastfeeding on demand and so on) cannot be reported by the participating mothers in the form of self-reported experience.

A prospective study by Pincombe *et al.*, (2008) with a sample of 317 primiparous mothers in Australia followed for the first six months after birth found that the use of formula supplementation, the use of pacifier/ dummy or nipple shield and, interestingly, breastfeeding on demand while in the hospital were associated with shorter duration of breastfeeding. After adjusting for different socio-demographic factors, “breastfeeding on demand” remained positively associated with early initiation of weaning (adjHR: 1.71; 95% CI: 1.03-2.86). The authors concluded that the surprising association between breastfeeding on demand and shorter duration of breastfeeding was confounded by other factors. “*Mothers that BF on demand had higher median self-efficacy score, smoked less, studied at a tertiary*

level, had fewer cesarean sections and more vaginal deliveries. These attributes were associated with longer duration of BF, and they confounded the simple comparison of demand-feeders with other women in the study” (Pincombe et al., 2008).

Even though studies have varied in terms of their study design (set of steps included in the investigation, breastfeeding outcomes, length of follow-up and so on), it appears that the most consistent, and perhaps non-surprising, association with early discontinuation of exclusive breastfeeding is the provision of other non-breast milk liquids while at the clinic (Perrine *et al.* 2012; Pincombe *et al.* 2008), especially formula supplementation (Semenic, Loiselle and Gottlieb, 2008; Parry *et al.* 2013; Chantry *et al.* 2014).

In a US national study, Declercq *et al.* (2009) examined the effect of the implementation of the 10 Steps for mothers to achieve their intention for EBF duration in primiparas and multiparas separately. For primiparas, four maternity practices were associated with BF intention: only breast milk (not other supplement) (adjOR: 4.4; 95% CI: 2.1-9.3), providing information on community BF support resources (adjOR: 2.3; 95% CI: 1.1-4.9); health support for BF initiation (adjOR: 6.3; 95% CI: 1.8-21.6); no use of pacifier (adjOR: 2.3; 95% CI: 1.1-4.4). For multiparas only breast milk (adjOR: 8.8; 95% CI: 4.4-17.6) and support of BF on demand (adjOR: 3.4; 95% CI: 1.7-6.8) were the only maternity services that were statistically significant with the fulfillment of the maternal intention of EBF duration.

Table 4.5 presents the main characteristics of the observational studies that investigated the effect of compliance to BFHI ‘s 10 Steps on BF outcomes.

Table 4.5: Evidence from Observational studies on the association of the overall or partial implementation of the 10 Steps on BF outcomes.

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
Overall or Partial Implementation of the 10 Steps				
Brodrigg et al (2013) Australia	Retrospective cohort study	6752 mother-infant pairs completed the survey	To estimate whether there is a difference in BF and EBF rates between mothers that gave birth in BF-designated and non-BF hospitals and those that experienced four of the 10 BF maternity practices	21.6% of participants gave birth in a BF hospital Mothers that gave birth in BF hospitals more likely to experience at least 2 of the four maternity practices studied (early skin-to skin contact, early BF initiation within 1 hour, rooming-in, only BM) Higher Odds of EBF at first (adjOR: 2.20; 95% CI: 1.78-2.71) and fourth month (adjOR: 2.93; 95% CI: 2.40-3.60) among mothers that experienced all four maternity practices than those that experienced > than all four. Mothers that gave birth at a BF hospital were less likely to BF at first month (adjOR: 0.72; 95% CI: 0.58-0.90). No differences on BF were observed at fourth as well as on EBF at 1st and 4th month.

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
Mydlilova <i>et al.</i> (2009) Czech Republic	Retrospective cross-sectional	Data on Infant Feeding on 660 355 infants before hospital discharge	To examine infant feeding practices used in maternity clinics To compare the infant feeding practices between BF and non-BF hospitals	BF rates increased from 22.3% in 2000 to 50.8% in 2004 and 63.9% in 2006 Number of Baby-Friendly Hospitals increased from 17 in 2000 to 59 in 2006 EBF rates increased by 0.9% from 2000 to 2002 and decreased by 2% from 2002 to 2006 Higher EBF rates in Baby-Friendly hospitals than non-BF (90.32% vs 87.63%) Formula feeding rate remained approximately the same –from 2.84 to 2.94% from 2000 to 2006 (Under 2.7% in BF hospitals) An increase was observed in non BF hospitals from 3.05% to 3.21% during 2000-2006 Mean rate: BF vs non BF hospitals: 2.65% vs 2.99%; p-value<0.001) Partial BF rates increased from 4.92% in 2000 to 6.75% in 2006- higher in non BF hospitals but

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
				increased in both BF and non-BF hospitals (mean rate 4.2% vs 6.5%; p-value<0.001)
Murray et al. (2007) US	Population–based study (the Pregnancy Risk Assessment Monitoring System (PRAMS)	Stratified random sample of mothers – representative of all mothers residing in Colorado that gave birth in a period of 2 years	To investigate the effect of Baby Friendly maternity practices on BF duration and whether this effect differs based on the maternal socioeconomic status	Five of the nine maternity practices were associated with BF duration (BF within 1 hour after birth, only breast milk, rooming-in, no use of pacifier, information on finding support after support) Higher proportion of BF mothers that experienced all five practices than those that experienced fewer than five regardless of socio-economic status Higher proportion of mothers that belong to higher socio-economic status reported of BF duration at later point in the postpartum period whereas mothers of low socio-economic status reported of longer duration of BF early in the postpartum period
Merewood et al. (2005) US	Cross-sectional	29 of 32 US BF designated Hospitals	To assess BF rates of the BF hospitals in the US	BF hospital BF initiation rates were higher than the mean US BF initiation rates in 2001 (83.3% vs 69.5%) BF rates differed by location (region and state)

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
				BF rates influenced by race proportion- lowest among African Americans Step 2 (8 of 29 hospitals), 6 (9 of 29) and 7 (5 of 29) the most difficult for compliance. Also Steps 7 and 9 were reported as difficult to implement
Merten et al. (2005) Switzerland	Cross-sectional study (24h dietary recall questionnaire) and retrospective cohort study (questionnaire on the introduction of solids and liquids)	Random sample of 2861 mothers and infants aged 0-11 months from 183 community based mother-infant services and 2 hospitals (1142 infants born in 45 BF hospitals-519 born in BF hospitals with high compliance to the BFHI and 737 born in hospitals with	To investigate the impact of maternity practices on BF rates To identify the changes in the prevalence of initiation and duration of any BF, EBF and full BF between 2003 and 1993	Median BF duration increased between 1994-2003 (from 22 to 31 weeks)

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
		low compliance; 630 infants born in 31 hospitals in process for receiving the designation, for 519 no information on the compliance		
Broadfoot et al. 2005	Annual surveys from 1995-2002	All Scottish Maternity units with > 50 births/years (N=33) Records N=464 246	To investigate the effect of the implementation of BFHI on BF rates during the first week postpartum	BF rates in BF hospitals increased by 11.4% (95% CI: 10.35-12.43) between 1995-2002 (from 41.1% Vs 52.5%) compared to non-BF hospitals with an increase in rates of 8% (95% 7.21-8.73) (from 41.1% Vs 52.5%) Mothers that gave birth in a Baby Friendly Hospital were more likely to exclusively BF than those that did not. (OR: 1.34; 95% CI: 1.32, 1.37) The association remained significant after adjustment for socio-demographic variables (deprivation, maternal age, number of births/hospital, year of birth) (OR: 1.28; 95% CI: 1.24,1.31)

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
Giovannini et al. (2005) Italy	Longitudinal survey (1999-2000)	2450 mother-infant pairs	To identify the determinants of Predominant BF during the stay in maternity clinics To investigate the association of EBF vs Predominant BF with BF duration	Non adherence to Steps 6 (adjOR: 1.58; 95% CI: 1.21-2.05), 7 (adjOR: 1.43; 95% CI: 1.05-1.95) or 8 (adjOR: 1.76; 95% CI: 1.32-2.35) associated with Predominant BF compared to EBF Mothers in the Predominant BF group were more likely to report of termination of Full BF earlier than those in the EBF during the first six months (3.1 vs 3.6 months; p-value<0.01), earlier introduction of formula (3.3 vs 3.8 months) and higher introduction of formula in 1 month (30% vs 23%)
Merten et al. (2004) Switzerland	Survey- Questionnaires given for collecting information on birth weight, biomedical data, implementation of the 10 Steps,	All Swiss BF hospitals (N=28) - 5790 infants	To estimate the prevalence of EBF at the beginning of the monitoring of the BF hospitals To identify the determinants of non-compliance to Step 6 To investigate whether compliance to Steps 4, 6, 7 and 9 was improved after introducing monitoring	Only 38% of infants born in BF hospitals were EBF (Range: 8-85%) Almost all (97%) of the infants born in Baby-Friendly hospitals initiated BF Variability between hospitals in meeting the criteria for the BFHI: Step 4 (47-99%), rooming-in (12-95%), Step 9 (pacifier or artificial teats: 2-47%)

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
	maternal socio-demographic characteristics			
Merewood <i>et al.</i> (2003) US	Medical records of all surviving infants admitted to a BF-designated hospital before the initiation of the process of the designation (1995) and after receiving the accreditation (1999)	1 BF hospital	To investigate the effect of the implementation of the 10 Steps on BF initiation and duration in a hospital 's NICU before and after the designation	BF initiation rates increased from 34.6% to 74.4% at the first week postpartum BF and EBF rates at 2 weeks postpartum increased significantly from 27.9% to 65.9% in 1995 and 9.3% to 39% in 1999, respectively Six of nine infants in the NICU were BF at six weeks in 1999 compared to one of eight infants in 1995
Philipp <i>et al.</i> (2001) US	Medical records randomly selected from	Random sample of 200 infants	To compare BF rates before (1995), during the process of designation	Increased trend of BF and EBF rates from 1995 to 1998.

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
	years 1995, 1998, 1999		(1998) and after the implementation of the BF maternity practices	BF rates were raised from 58% in 1995 to 77.8% in 1998 to 86.5% in 1999 (p-value< 0.001) EBF increased from 5.5% in 1995 to 28.5% in 1998 to 33.5% in 1999 (p-value< 0.001) BF rates increased among black women
DiGirolamo, Grummer-Strawn and Fein. 2001	Longitudinal mail survey- The Infant Feeding Practices Survey (IFPS)	2610 mothers	To estimate the prevalence of five of the ten maternity practices in BF hospitals in the US as experienced by mothers (BF initiation within 1 hour after birth, only breast milk, rooming-in, BF on demand, no use of pacifiers)	Only 7% of mothers experienced all five steps Late initiation of BF (adjOR: 1.6; 95% CI: 1.1-2.3) and supplementation (adjOR: 2.3; 95% CI: 1.5-3.3) were positively associated with early BF cessation No association of early BF discontinuation with rooming-in (adjOR: 1.0; 95% CI: 0.7-1.4), use of pacifier (adjOR: 1.1; 95% CI: 0.8-1.7) and no BF on demand (adjOR: 1.2; 95% CI: 0.8-1.7) A dose-response association between the implementation of maternity practices and BF duration during the first six weeks- The fewer the maternity practices mothers experience the higher the risk of BF discontinuation

Reference (Year)	Study Design	Study	Objective (s) of the study	Results
				Mothers that experienced none of the five maternity practices were almost eight times more likely to terminate BF before the sixth week than those that experienced all five (adjOR: 7.7; 95% CI: 2.3-25.8); Also One maternity practice Vs All (adjOR: 4.5; 95% CI: 1.5-14.2); Two maternity practices Vs All (adjOR: 4.0; 95% CI: 1.3-12.3)

4.6.2.3 Evidence from intervention Studies

The majority of studies assessing the association between the implementation of the “10 steps” and breastfeeding outcomes in the published literature are observational. This was also the conclusion of a recently published systematic review on the subject (Pérez-Escamilla, Martinez and Segura-Pérez, 2016). Of 58 reports identified in their review, nine were based on three randomized controlled trials. The rest of the studies were quasi-experimental designs (N=19), prospective studies (N=11) and cross-sectional or retrospective (N=19). Even so, the authors conclusion was, to quote: “*Adherence to the BFHI Ten Steps has a positive impact on short-term, medium-term and long-term breastfeeding (BF) outcomes. There is a dose–response relationship between the number of BFHI steps women are exposed to and the likelihood of improved BF outcomes (early BF initiation, exclusive breastfeeding (EBF) at hospital discharge, any BF and EBF duration)*”. Interestingly, they also concluded that community support (step 10) appears to be essential for sustaining any impacts of the BFHI in the long term. The lack of intervention studies is not surprising due to the nature of the intervention and the pragmatic difficulty in randomizing units to BFHI. It is more likely that studies apply observational designs either in the form of descriptive comparative designs i.e. comparing maternity units that have implemented the BFHI with control facilities (Kramer *et al* 2001) or pre-post quasi-experimental designs (Taddei *et al.* 2000; Sherburne-Hawkins *et al.* 2015) These studies have been discussed in the section above alongside the observational studies with a survey study design.

The first intervention study was the seminal and most well-cited to date PROBIT study in the Republic of Belarus (Kramer *et al.* 2001). This was a cluster randomized trial. The study investigated the effectiveness of BFHI by randomly assigning 31 hospitals to either the BFHI intervention or control arm. During the study period as many as 17,046 mother-infant dyads were included in the data analysis. The prevalence of Breastfeeding and Exclusive Breastfeeding was measured at 3, 6, 9 and 12 months. The study found a higher prevalence of BF in the maternity clinics in the intervention arm compared to the control arm at the third (72.7% vs 60%; adjOR: 0.52, 95% CI: 0.40, 0.69) and sixth month of follow-up (49.8% vs 36.1%; adjOR: 0.52, 95% CI: 0.39, 0.71). Furthermore, the study showed differences between intervention-control arm at longer follow-up periods. The breastfeeding prevalence at nine months among the group of women who delivered in a BFHI hospital (intervention arm) was 36.1% in comparison

to 24.2% among mothers who gave birth in the control hospitals (adjOR: 0.51, 95% CI: 0.36, 0.73). At 12 months, the prevalence of BF was 19.7% in the intervention group compared to 11.4% in the control group (adjOR: 0.47, 95% CI: 0.32, 0.69).

The study demonstrated the effectiveness of the implementation of the BFHI on improving breastfeeding was not short-lived since differences between intervention and control arms were observed both in the short-term as well as the long-term, and up to a period of 12-months after birth. Furthermore, the study found that the effect was not just restricted to a higher likelihood and longer duration of any breastfeeding, but also showed a significant effect of the intervention on exclusive breastfeeding. The proportion of mothers exclusively breastfeeding at 3 months was 7-times higher in the experimental group than the control group (43.3% vs 6.4%; p-value<0.001) and more than 12-times higher at 6 months after birth (7.9% vs 0.6%; p-value=0.01). Of course, it should be noted that even though there was a statistically significant effect of the intervention on the likelihood of breastfeeding at 6 months after birth (49.8% vs 36.1% in the control group), as well as the likelihood that this is exclusive by comparison to the control group, the prevalence of mothers who exclusively breastfed at 6 months was quite low even in the intervention arm (7.9% vs 0.6%). This finding is not surprising since recommendations for EBF are for six months.

The other two intervention studies identified by the Pérez-Escamilla *et al* (2016) review were conducted in Brazil. However, the aim was not to assess the BFHI 10 steps as a pack, but certain aspects of it. In Coutinho *et al* (2005) study, following training of the maternity care staff in the 10 steps, mothers were randomized to receive ten postnatal home visits (step 10). The authors found that strengthening step 10 had a significant positive impact of the intervention on the prevalence of exclusive and any breastfeeding. Taddei *et al* randomly assigned eight hospitals in Brazil to Ten Steps training or to continue the standard of care but did not find an impact of the training of the staff on breastfeeding duration (Taddei *et al.*, 2000).

More recently, a quasi-experimental study by Sherburne-Hawkins *et al.* (2015) was conducted in the USA with the participation of 13 hospitals that received BF accreditation before 1999 or became accredited during the period 1999-2009 (participants=11723) and 19 non BF designated matched hospitals (participants=136040). Matching was achieved by identifying the Baby Friendly maternity facility's "nearest neighbours", determined by calculating the Euclidian distance between

standardized values of pairs of observations. These were the number of births as a proxy for the size of birth facility, the proportion of white mothers and the proportion of mothers with high education. Even though the study did not find an overall difference between the BF and not-BF designated hospitals, the study reported a differential effect of the intervention in terms of educational attainment. In fact, the study recorded an increase of 3.8% in Breastfeeding initiation rates in designated Baby-friendly hospitals (adj coef = 0.038; 95 % CI: 0.00, 0.08) and of 4.5% in EBF for four months or more (adj coeff = 0.045; 95 % CI: 0.01, 0.08) for only among mothers of lower educational attainment. This is due to the fact that mothers with higher maternal education are more likely to be aware of the BF accreditation and thereafter choose to give birth in Baby friendly hospitals. On the contrary, BF accreditation might help to reduce the effect of socio-economic disparities and therefore reduce the gap of health inequalities. Similar were the findings by Sherburne-Hawkins *et al.* (2014) with the participation of a smaller number of BFHI (n=4, participants=915) and non-BFHI hospitals (n=6, participants=1099) with an increase of 8.6% in Breastfeeding initiation rates in designated Baby-friendly hospitals (adj coeff: 0.086; 95% CI: 0.01-0.16) only among mothers of lower educational attainment. Also, for each additional BF maternity practice, there was an increase in BF initiation of 14.6% (adj coeff, 0.146 [95% CI, 0.13 to 0.16).

More details about the findings of these studies, including findings with regards to the implementation of the 10 steps (i.e. the fidelity of the intervention) and the effect of the intervention on other important mother-child health outcomes are listed in the **Table** below.

Table 4.6: Evidence from Intervention studies on the effect of the Implementation of the partial or overall implementation of the 10 Steps on BF initiation, duration and exclusivity

Reference (Year)	Study Design	Study	Description of Intervention	Outcomes
Overall Implementation of the 10 Steps				
Kramer et al. 2001 Belarus	Cluster Randomized Control Trial (RCT)	31 maternity clinics and hospitals (17046 mother infant pairs) randomly assigned the BFHI group and the control group	• Groups: <u>Intervention group:</u> 16 hospitals (8865 mother-infant pairs) <u>Control group:</u> 15 hospitals (8930 mother-infant pairs) • Cluster randomization: According to geographic region, urban vs rural status, number of deliveries/ year ($\neq 500$ if ≥ 2500) and BF initiation rates ($\neq 5\%$) • Participant Enrollment to those followed up to a single maternity clinic (max efficiency) in each of the participating hospitals	<u>BF outcomes</u> 60% of mothers were BF at 3 months-higher were the BF rates at the intervention group at 3 months (73%; range: 64-87%) as well as throughout the first year vs mothers in the control group (60%; range: 46-78%) Predominant BF: <u>Intervention vs control group:</u> 3 months: 51.9% vs 28.3% (Adj OR: 0.28; 95% CI: 0.16-0.49) 6 months: 10.6% vs 1.6% p-value=0.003

• Intervention Allocation: Based on double-randomization procedure- using a random number table, 2-digit random number was assigned to each pair of the maternity clinic/hospital (interventions A or B) • The pair was assigned to either to the intervention or the control group- simple randomization was used (coin flip used- B sites received BFHI intervention and A sites received the control intervention) • Training for the BFHI intervention: 18 hour BFHI lactation management training (EBF promotion, maintain lactation, facing common lactation problems) Duration of training for all HCPs: 12-16 months	Significantly higher were the EBF rates in the intervention group at 3rd and 6th month respectively: <u>Intervention vs control group:</u> 43.3%vs 6.4% (7 fold higher; p-value <0.001) at 3 months 10.6% vs 1.6% (>12 fold higher; p-value =0.003) at 6 months <u>Infectious diseases outcomes</u> GI tract infections: 40% lower risk of >= 1 episodes in the 1st year in the intervention in comparison to the control group (Risk: 0.60; 95% CI: 0.40-0.91) Respiratory tract infections: ORs: 0.87; 95% CI: 0.59-1.28 for >= 2 Respiratory tract infections – risk lower but non-significant

Monitoring Visits prior to, Otitis media
during recruitment and follow
up ORs: 1.01 95% CI:0.54-1.88- no effect of
BF on the
Atopic Eczema:
ORs: 0.54 95% CI: 0.31-0.95- Lower risk
by 46%

Sherburne Hawkins et al 2014 USA	Quasi- experimental study based on the PRAMS (Pregnancy Risk Assessment Monitoring System) surveillance project	915 mother-infant pairs from four Baby Friendly designated hospitals (before or after the accreditation) and 1099 mother- infant pairs from six matched non Baby- Friendly designated hospitals by the size of the clinic, % of Caucasian women	To assess compliance of Baby Friendly Hospitals to the 10 Steps to Breastfeeding practices To evaluate the effect of the BFHI maternity practices on BF initiation and duration	<u>BF outcomes</u> • Higher % of mothers experienced all seven maternity practices in BF hospitals than those that gave birth in the non BF hospitals (34.6% vs 27.1%) • After accreditation an increase by 8.6% (adjcoff: 0.086 95% CI: 0.01-0.16) points in BF initiation among low income women. no change among mothers with higher education or in overall • An increase of 14.6% points in BF initiation by each additional practice experience (adjcoff: 0.146 95% CI: 0.13-0.16) <u>Compliance to Steps</u>

		and % women with high educational status	• Step 3: 96% vs 90.6% vs 91.9% BF post accredited vs BF pre accredited hospitals vs non BF accredited hospitals • Steps 4 to 9 from 57% to 87% (BF post accredited hospitals); 57.5% vs 89.1% pre accreditation vs 51.8% -90.5% for non BF designated hospitals • Noncompliance to the Code: 28% vs 35% vs 67% (BF post accredited vs BF pre accredited vs non BF hospitals) A decrease of 11.3% in BF initiation with non-compliance to the Code (adjcoff: -0.113 95% CI: -0.15- -0.08)
Sherburne Hawkins et al 2015	Quasi-experimental / longitudinal based on the PRAMS surveillance project	11723 mothers that gave birth in 13 BF designated hospitals and 13,604 mothers that gave birth in 19 non BF designated matched hospitals	The impact of the BFHI on BF initiation and duration overall and according to education level <u>BF outcomes</u> Higher BF initiation rates in in BF accredited than non-BF accredited hospitals Moternal education a significant correlate of giving birth in a BFHI hospital- an increase by 2.2% of births in

	between 1999-2009 (participation of 5 US states)	BFHI among women of higher educational attainment (>13 years of education) than those of lower educational attainment (<12 years) Higher BF and EBF rates for ≥4 weeks was higher in BF accredited than non-BF accredited hospitals (76% vs 73%; 50% vs 42%) Socio-demographic differences in BF initiation rates An increase of 8.6% points in BF initiation rates in designated Baby- friendly hospitals (adj coeff: 0.086; 95% CI: 0.01-0.16)
Coutinho et al (2005)	Conducted in two phases: 1. Pre- and post intervention trial of training 350 women that gave birth in 2 baby- friendly hospitals. Mothers were	To compare the effect of the hospital-based intervention with the combination of the hospital-based and community- • Post vs Pre-intervention EBF rates: 70% (2001) vs 21% (1998) (p-value < 0.001) • Intervention vs control group: • 10 days: 30 • 30 days: 15%

	the maternity staff randomly assigned to based intervention on BF with the BFHI 2. the intervention group practices up to the sixth month Hospital based that received 10 postnatal home visits combined hospital (n=175) and those that based and did not receive home community-based visits	
Taddei et al. 2000	Randomized Institutional Trial 8 hospitals randomly assigned to either the intervention group (their staff attended a lactation training) and the control group for each of the hospitals: two cohorts composed of about 50 children each 1st cohort: babies aged 1-6 month before the	The effect of the lactation training on BF outcomes <i>Exclusive BF Duration</i> Control group: adjHR: 0.98 (0.79-1.22) Intervention Group: adjHR: 0.71 (0.59-0.85) <i>Full BF Duration</i> Control group: adjHR: 1.16 (0.93-1.45) Intervention Group: adjHR: 0.80 (0.67-0.97) <i>Overall BF Duration</i> Control group: adjHR: 1.55 (1.23-1.96)

training (total: 494/609 infants (81%))	Intervention Group: adjHR: 1.01 (0.83- 1.22)
2nd cohort : babies aged 1-6 month after the training (Total: 469/555 (84%))	Pre-post % of mothers that receive

4.7 Evidence Assessing Individual Steps

The studies in the section above assessed either the association of the 10 steps with breastfeeding outcomes or the effectiveness of the 10 steps in improving breastfeeding outcomes as a set of practices. Several other studies have assessed the degree of adherence to individual factors (listed as part of the 10 Steps to Successful Breastfeeding) and/or the association with BF outcomes and/or the potential mechanism behind the observed association. This section will discuss the findings of such studies, organized in the order of the 10 Steps. **Table 4.7** provides examples of study designs information that can be used to investigate the individual effect of the ‘10 Steps’.

4.7.1 Step3: Inform all pregnant women about the benefits and management of breastfeeding.

Step 3 refers to informational and educational support to pregnant women early in the prenatal period. It specifically calls for giving information to all pregnant women with regards to the benefits of breastfeeding as well as educate women about the management of breastfeeding. This includes discussing the importance of exclusive breastfeeding during the first six months of life and the continuation with breastfeeding along with complementary feeding for the health of mother and baby. It also concerns the education on the management aspects of breastfeeding ranging from practical aspects such as understanding and practicing the proper positioning and latching during breastfeeding to factors that may interfere with proper establishment of breastfeeding early on such as the importance of feeding on demand, avoiding the use of pacifiers and any feeding supplementation (Wouk, Tully and Lobbok, 2017).

A recently published systematic review focused specifically on the effect of prenatal informational and educational interventions on BF initiation, duration and exclusivity (Wouk, Tully and Lobbok, 2017). Out of 17 studies included in the review, six documented a positive impact of prenatal educational interventions on BF. The type and nature of the interventions varied widely across studies, even among the six studies which reported positive effects. The identified studies used a different number of means to modify potential determinants of BF. Some used web-based educational programs with a variety of textual, graphical, animations, interactive flash animations, audio and

video educational material. One study aimed at improving breastfeeding self-efficacy through a prenatal BF workshop with varied tools including dolls, videos and group discussions. Other studies use educational booklets in addition with a video session followed by two phone calls or a session with a lactation counselor or a combination of both. Overall, it seems that the studies that did not find a significant or any effect on BF used no interpersonal support.

4.7.2 Step 4: Help mothers initiate breastfeeding within one hour of birth

Step 4 (a): Skin-to-skin conduct

Early skin-to skin conduct is the placement of the naked baby immediately on mother's bare chest after birth or soon afterwards that facilitates the adaptation of newborn infants to extrauterine life through the regulation of their cardio-respiratory rate, their body temperature, blood glucose in full-term infants (Moore and Anderson, 2007). A number of studies, either with an observational or intervention design, provided evidence on the beneficial effects of skin-to skin conduct on the mother and the child within the first hour after birth (Mikiel-Kostyra, Mazur and BoLtruszko, 2002; Moore *et al.* 2012; Mahmood *et al.* 2011). It is generally attributed to better infant glucose regulation after birth, physiological stability and thermoregulation as well as maternal-infant bonding and reduced maternal postoperative pain (Moore *et al.* 2012). There is an interrelation of skin to skin and early BF initiation (WHO, 1998). Skin to skin presupposes early initiation of BF within the first hour which in turn was associated with higher BFSE (Koskinen *et al.* 2014). Further, skin to skin increases maternal confidence in relation with infant care and improved ability to recognize and respond to their infant needs sooner than in the case of not experiencing the maternity practice (Crenshaw, 2007).

Observational studies

In a prospective cohort study (Mikiel-Kostyra, Mazur & BoLtruszko, 2002) with participation of 1250 mother-infant pairs, the time of breastfeeding commencement as well as the duration of the practice were recorded. The earlier skin-to-skin conduct was practiced, the longer the duration of EBF in the long run. Specifically, EBF increased by 0.39 months (AdjOR: 1.70; 95% CI: 1.47-1.96) and BF increased by 1.43 months with the implementation of skin-to skin. When the effect of duration of skin to skin was

investigated on EBF and overall BF duration, a statistically significant difference in EBF duration was found between short skin to skin contact (up to 20mins) and extensive skin to skin contact (20mins or longer) ($p < 0.001$) but not for overall BF duration ($p=0.112$). The difference was significant for both EBF and overall BF, when extensive skin to skin was compared with lack of conduct ($p=0.013$ and $p < 0.001$, respectively).

Similar findings on the importance of early skin-to-skin conduct on the initiation and duration of EBF were also reported in other studies (Bramson *et al.* 2010). For instance, Asole *et al* (2009) investigated the association of maternity care practice during hospital stay with breastfeeding at the first month after birth, following 165 women who were in 17 hospitals on the day of study contact and gave birth the previous 5 days without any complications in the area of Lazio. The proportion of mothers who initiated breastfeeding (58.3%) was higher among mothers who experienced skin-to-skin within half an hour after birth in comparison with those (24.7%), that still experienced skin-to-skin but with a longer delay (i.e. 2 hours after birth) even though they roomed-in, received information on the benefits of BF, breastfed on demand. However, skin-to-skin was not associated with BF at 1st month after birth.

Furthermore, in addition to the timing, the duration of the practice may be important. The cohort study by Mikiel-Kostyra, Mazur & BoLtruszko, 2002, showed that extensive skin-to-skin conduct (operationalized in the study as longer than 30 mins) was associated with prolonged EBF by 1.35 months and any BF by 2.10 months in comparison with no skin-to-skin conduct. No significant difference was observed in terms of EBF or any BF between mothers who practiced skin-to-skin but for shorter duration and those who did not have any skin-to-skin contact.

Intervention studies

A Cochrane review (Moore *et al.* 2012) with 30 studies (29 randomized control trials and 1 quasi-experimental design) identified a statistically significant relationship of early skin-to-skin conduct with better performance on all different measures of BF

status employed by the various studies. This includes successful first breastfeeding, Index of Breastfeeding Status⁶, BF duration, prevalence of breastfeeding at one to four months postpartum (10 studies; OR: 1.82; 95% CI: 1.08-3.07). A number of studies showed positive outcomes in terms of potential mediating factors such as maternal feelings, reduced anxiety within the first days after birth, improved maternal self-efficacy about infant care. The authors identified only one study that assessed the effect of skin-to-skin conduct on EBF during the first 4-6 months (OR: 5.67 95% CI: 2.27-14.15).

In a randomized control trial (RCT) not included in the review discussed above, Mahmood *et al.* (2011) investigated the effect of early skin-to-skin (SSC) conduct on the first successful breastfeeding among 253 mother-infant pairs. Success of the procedure was assessed with the Infant Breastfeeding Assessment Tool⁷ (IBFAT) score (Score: 10-12 indicated a successful first breastfeeding). IBFAT tool is used to evaluate More than half of the mothers in the SSC group scored higher than 10 in comparison to 32.5% in the control group. Furthermore, skin-to skin facilitated the process of early initiation of BF with a mean time of BF initiation of 61.26 mins earlier in the SSC group compared to the control group.

Step 4 (b): Time to first Breastfeed after birth

Literature on the effect of the timing of first breastfeed (independently of whether this is by skin-to-skin conduct) on BF initiation, establishment and duration is limited. A

⁶ Index of Breastfeeding Status is a single item indicator developed on the basis of the IGAB/ Innocenti definitions and consists of three BF sub-categories (Full-exclusive, partial and token) (Moore et al. 2014) which were based on the schema developed by Labbok and Krasovec (1990) attached to these definitions (Labbok and Starling, 2012). The IBS is based on the assumption that the infants are fed directly from the breast (Damato *et al.* 2005)

⁷ The Infant Breastfeeding Assessment Tool measures infant breastfeeding behavior and maternal perception and satisfaction in relation with infant feeding. The tool consists of four items that represent the major components of infant BF behavior (measuring infant suckling competence) . These are readiness to feed, rooting reflex, fixing (latching on) and sucking pattern. Each component is given a score 0-3 with a maximum total score of 12 which represents adequate infant suckling competence. (Moore *et al.*2012)

cross-sectional study with retrospective recall of the timing of BF initiation among 318 mother-infant dyads (Nakao *et al.* 2008) investigated the effect of time of first breastfeed on BF duration up to the first four months. According to this study, full BF (infant receives BF as well as other liquids or solids but not infant formula) at four months was associated with BF initiation within 120 minutes after birth (OR: 2.45; 95% CI: 1.21-4.95; p-value=0.01). A positive association was reported between full BF continuation at the first four months and initiation of BF within the first 30 mins after birth (which is in fact the definition of early initiation as well as ideal recommendation of the BFHI). However, the estimate was only marginally statistically significant (OR: 1.82; 95% CI: 0.97-3.43; p-value=0.06). Other than the small sample size, the retrospective design of this study might have introduced some recall bias regarding the exact time of initiation.

It has to be noted that birth by cesareans section was identified as the most significant barrier in the implementation of skin-to-skin (Mikiel-Kostyra, Mazur & BoLtruszko, 2002; Rowey-Murray and Fisher, 2002). In the case of C/S, breastfeeding is initiated well after birth (Rowey-Murray and Fisher, 2002), thus leading to difficulty in successfully establishing breastfeeding early and consequently to premature discontinuation (Chapman and Perez- Escamilla, 1999; Prior *et al.* 2012). Studies that provided results of the association of skin to skin with BF outcomes after adjustment for mode of delivery, suggest of the beneficial effects of skin to skin on BF outcomes irrespective of the type of delivery (Mikiel-Kostyra, Mazur & BoLtruszko, 2002; Nakao *et al.* 2008)

4.7.3 Step 7: Practice rooming in - allow mothers and infants to remain together 24 hours a day

Rooming-in refers to keeping the mother and the newborn together in the same room. Rooming-in was considered to be beneficial not only for BF initiation and establishment, but also for the mother-infant relationship (WHO 1998). To make the recommendation, the WHO considered evidence that suggests there was no negative effect on maternal sleep while in fact rooming-in reduces the infant crying episodes (WHO, 1998).

In a trial with the participation of 176 mothers in Russia to investigate the potential independent effect of rooming-in on breastfeeding outcomes (Bystrova *et al.* 2009), mothers were randomly assigned to four experimental groups: skin-to-skin with rooming-in, skin-to-skin with 24h nursery care, no of skin-to-skin with rooming-in initiation delayed up to three hours after birth, no skin-to-skin with 24h nursery care. Mean frequency of feedings was higher among the group of mothers who practiced rooming-in (8.3, SD=2.2) than the 24hr nursery groups (7, SD=0.0). Lack of variability was due to the fact that feeding timing was fixed. However, no significant differences were obtained on nearly EBF duration between the four groups (skin-to-skin/ rooming-in: 4 months; skin-to-skin/ 24h nursery care, no of skin-to-skin/ rooming-in initiation delayed up to three hours after birth, no skin-to-skin/ 24h nursery care).

4.7.4 Step 9: Give no pacifiers or artificial nipples to breastfeeding infants

Implementation of Step 9 suggests the avoidance of pacifier or any artificial teats during breastfeeding. However, adherence to the specific recommendation is reported low even in randomize control trials (RCTs), where clear guidance about the adverse effects of pacifier use are well acknowledged and part of the intervention. For instance, in PROBIT study, pacifier use was reported by six out of ten infants even in the intervention groups (61.4%) as compared to eight out of ten infants (84.0%) in the control group (Kramer *et al.* 2001). Similar results have been reported in other studies suggesting that the particular practice may be more challenging to influence. For example, 31% of infants received a pacifier during their stay in the hospital even though instructions were given to avoid them (Collins *et al.* 2004).

A number of observational studies demonstrated an association between pacifier use and premature discontinuation of BF (Howard *et al.* 1999; Aarts *et al.* 1999; O Connor *et al.* 2009) or non-exclusivity (Aarts *et al.* 1999; de Nascimento *et al.* 2010). In fact pacifier was found to be independently associated with shorter BF duration (Howard *et al.* 1999). It was suggested that the use of a pacifier or an artificial teat might interfere with the process of infant learning to suckle. Infant preference to an artificial teat might be developed. However, the mechanism has not been fully explained (WHO, 1998)

Kramer *et al.* (2001) conducted a randomized controlled trial to investigate whether providing an advice to avoid pacifier use and using other means of calming a fussy and crying baby can reduce the risk of early weaning and whether this (i.e. avoiding pacifier use) is positively associated with the frequency or duration of crying and fussing. No differences were observed between the intervention and the control group in relation with early weaning (18.9% vs 18.3%) with and premature EBF discontinuation (63.8% vs 66.4%). When an observational analysis was carried out in relation with early weaning and pacifier use, a higher proportion of infants exposed on daily or ever pacifier use, weaned (25% and 21.3% vs 12.9% and 11.4%) and discontinued EBF (72.6% and 69.1% vs 58.3% and 54.3%) earlier than 3 months respectively (BF: 1.9; 95% CI: 1.1-3.3; EBF: 1.2; 95% CI: 1.04-1.5). However, pacifier use had no effect on cry/fuss baby behavior suggesting that pacifier use might be a marker of a set of behaviors that are difficult to be measured. Kramer *et al.* (2001) suggested that the use of a pacifier might be a marker for maternal behaviors that can not be easily measured such as the presence of BF problems (i.e. reverse causality) and fussy infants because of reduced BF production (Kramer *et al.* 2001; O Connor *et al.* 2009). Also, pacifier use is usually regarded by mothers as a positive behavior associated with longer intervals between feedings and taking the babies of their breast (residual confounding) (O Connor *et al.* 2009).

It has been suggested that the use of pacifier may interfere with breastfeeding technique. Many mothers experience breastfeeding problems due to incorrect and ineffective breastfeeding technique. In a study that investigated the effect of breastfeeding technique on BF duration, only ineffective sucking (adjHR: 1.87; 95% CI: 1.38-2.55) and ineffective milk transfer (adjHR: 1.78; 95% CI: 1.29-2.45). Positioning and latch were not found to influence breastfeeding duration, and in fact, pacifier use was not found to influence breastfeeding technique (Kramer *et al.* 2001).

4.7.5 Step 10: Seek help on BF after discharge

Step 10 refers to the advice given to breastfeeding mothers where to seek help on BF after discharge. However, the existence of support in the community is a prerequisite for the implementation of Step 10. A large body of literature provides evidence on the effectiveness of postnatal community-based peer/lay and professional support on BF

outcomes (Chung *et al.* 2008, Renfrew *et al.* 2012, Haroon *et al.* 2013). This is further discussed on **Chapter 3 (Section 3.5.4)**.

Table 4.7: Type of Studies most likely to investigate the implementation of each step

Maternity Practices	Study/Studies most likely to be conducted	Example Reference
Step 1	Audit study	None identified
Step 2	Survey assessing Health Care Professionals' (HCPs) knowledge and attitudes towards BF/ self-confidence on giving practical assistance on BF	None identified
Step 3	RCTs or quasi-experimental	Anderson <i>et al.</i> 2005
Step 4 (a) <i>BF initiation within half an hour</i> (b) <i>Skin to skin</i>	Cross-sectional and/or prospective study Cross-sectional and/ or prospective study/ intervention study- RCT	Nacao <i>et al.</i> 2008 Mahmmood <i>et al.</i> 2011; Asole <i>et al.</i> 2009
Step 5 (a) <i>BF Support</i> (b) <i>Practical Assistance</i>	Intervention study Intervention study	None identified None identified
Step 6: only BM given	Cross-sectional and prospective study/ RCT	Kramer <i>et al</i> 2001
Step 7: Rooming in	RCT/ prospective study	
Step 8: BF on demand (a) <i>Frequency of BF</i> (b) <i>Duration of BF</i>	Cross sectional and Prospective study/ RCT Cross sectional and Prospective study/ RCT Cross sectional and Prospective study/ RCT	None identified None identified None identified
Step 9: no use of pacifier and other	Prospective study	Howard <i>et al.</i> 1999
Step 10: BF support at the community	Cross-sectional and prospective study/ RCT	McQueen <i>et al.</i> 2011; Chapman <i>et al.</i> 2010
ICBS	observational study	None identified

4.8 Summary

For over two decades, the “10 Steps” have been the cornerstone of national and international policies and strategies for the promotion, protection and support of BF. However, adherence to the “10 Steps” is suboptimal (Chlamers *et al.* 2009; DiGirolamo, Grummer-Strawn and Fein, 2001; Chien *et al.* 2007). In fact, it seems that the maternity care practices which are more consistently associated with a positive impact on BF (DiGirolamo, Grummer-Strawn and Fein, 2001) appear to be the least implemented, such as the practice of early initiation of breastfeeding in skin-to-skin position and no use of a pacifier (Chlamers *et al.* 2009).

The literature that supports the beneficial effects of the adherence to the BFHI on BF outcomes, and specifically “good maternity care practices” in the model of the “10 Steps”, is extensive. Observational and intervention studies have assessed the impact of implementation of the “10 Steps” on BF outcomes and have consistently showed positive effects on BF initiation, duration and exclusivity. The effect of the “10 Steps” is also apparent in the reduction of social inequalities in BF.

However, evidence of the individual effect of the “10 Steps” on BF outcomes is conflicting. While the implementation of specific maternity care practices has been consistently associated with BF outcomes, evidence is not as consistent or clear-cut for others. For example, immediate and longer skin-to-skin has been associated with higher BF initiation rates (Asole *et al.* 2009) as well as longer EBF and BF duration (Mikiel-Kostyra, Mazur and BoLtruszko, 2002; Bramson *et al.* 2010). Similarly, implementation of Step 9 (no pacifiers) has been acknowledged to be associated with longer BF (Howard *et al.* 1999; O Connor *et al.* 2009; Aarts *et al.* 1999) and EBF duration (Nascimento *et al.* 2010). However, pacifier use might represent an outcome of a rather complex maternal behavior which is difficult to pinpoint. For instance, mothers who do not intent to breastfeed, encounter lactation problems or decide to discontinue BF are more likely to introduce a pacifier as a result. Thus, the direction of the association between pacifier use and breastfeeding is not clear. In relation to Step 3 (education in the prenatal period), evidence on the effect of breastfeeding initiation and duration is also not clear. While a number of studies suggest a beneficial effect of prenatal information on BF outcomes, others do not (Murray *et al.* 2007). The type and nature of the interventions seems to influence the effectiveness of Step 3 on BF

outcomes. In general, it has to be noted that because of a high degree of collinearity between individual steps, it is generally considered very difficult to estimate the actual separate effect of each of the steps.

Chapter 5:

Breastfeeding Self-Efficacy

This chapter will focus on the definition and theoretical model of self-efficacy and its components based on Bandura's theory (**Sections 5.1-5.3**), as well as the theoretical and operational definitions of self-efficacy, specifically in relation to breastfeeding (**Section 5.5**).

5.1 Self-Efficacy Theory

As derived from Bandura's Social Learning Theory (1977), the self-efficacy theory defines self-efficacy as the cognitive process that delineates an individual's perceived belief in their ability to execute and accomplish a specific task or behavior that might be influential to other life events (Bandura 1977; Bandura, 1994). Self-efficacy, therefore, defines the performance of the specific behavior "*as it reflects of the individual perceptions about their perceived ability, not their actual ability*" (Dennis, 1999). A strong sense of self-efficacy results to a positive perception and success-promoting thought patterns with regards to the individual's ability to execute and achieve a specific behavior. This, in turn, enables the individual to be more persistent in performing the behavior and react emotionally to new situations, including difficulties and barriers, in a positive way (Bandura, 1994; Hinic, 2016). In contrast, low self-efficacy is more likely to be associated with negative thought patterns and emotional reactions such as expecting failure through a behavior perceived as discouraging and overwhelming (Bandura, 1994; Hinic, 2016). In turn, this is more likely to result in the early discontinuation of the behavior.

5.2 Sources of influence on Self-efficacy expectations

According to Bandura's theory, self-efficacy expectations and beliefs are influenced by four sources of information available to the individual: 1. Performance experiences and accomplishments (thus, in the case of breastfeeding self-efficacy, this will refer mainly to an individual's own previous experiences of breastfeeding), 2. Vicarious experiences (thus, in the case of breastfeeding, this will correspond to witnessing other mothers'

breastfeeding experiences either currently or in the past), 3. Verbal persuasion (i.e. the extent to which the individual has received guidance, advice or encouragement, especially from significant others with regards of breastfeeding), and 4. Physiological and Affective states (e.g. anxiety, pain, stress) (Bandura, 1994; Dennis & Faux, 1999; Dennis, 2003). **Figure 5.1** presents the theoretical framework of Breastfeeding Self-Efficacy as developed by Dennis (2003).

5.2.1 *Performance experience*

This is the most prominent and immediate source of self-efficacy. It is based on actual individual experiences or outcomes that have a direct effect on the level of efficacy expectations and beliefs, by either enhancing it or diminishing it (Bandura 1977, Bandura, 1994). However, it is theorized that the effect of the actual experience depends on how the individual interprets the performance as well as the desired outcome (Dennis, 1999). Previous pleasant breastfeeding experience has been established as a significant determinant of maternal breastfeeding self-efficacy and, thus it is associated with higher probability of successful BF initiation, continuation and exclusivity (Blyth *et al.* 2002; Wells, 2006; Dennis, 2006; Hinic 2016).

However, self-efficacy through performance experience might be influenced by factors that facilitate or impair a specific performance including the amount of support provided or required, the complexity of the task and the effort required or expended. For example, if a mother successfully performs what according to herself is a complex task on breastfeeding, this will have positive effects on self-efficacy, and thus the success-promoting thought processes which will enable the continuation of the behaviour. However, when a mother performs successfully a task, that is nevertheless perceived as simple and easy, this will not necessarily influence self-efficacy to the same amount and thereafter the ability to continue the behaviour. On the other hand, failure to complete the task successfully will have adverse effects on mother's self-efficacy (Dennis, 1999). Therefore, while if a breastfeeding mother completes successfully an uncomplicated task, this might not necessarily positively influence the breastfeeding outcome. However, failing in the task might have a significant adverse effect on self-efficacy. In reverse, achieving a difficult task will have a boosting effect on self-efficacy. Attention to successful or improved aspects of performance or outcomes tends to boost perceptions of self-efficacy, whereas attention to unsuccessful

aspects of the performance and outcomes tends to lower perceptions of self-efficacy (Dennis 1999). In addition to previous experiences, current breastfeeding experience and the perceived difficulty of the task has been described as a determinant of the behavior (Dennis, 2002; Thulier & Mercer 2009).

5.2.2 Vicarious experience

Another influence on self-efficacy is vicarious experiences. This involves strengthening the self-belief on achieving specific tasks or activities by observing other individuals' success in similar tasks or activities. Vicarious experience is one of the most effective source of self-efficacy, especially if there is no previous personal experience (Bandura, 1977; Bandura, 1994). The impact of observational learning depends on the characteristics of the "role model" or "role models" as well as the way in which they perform the task. It is thought that the greater the similarity of the observer's demographic and psychological characteristics to the role models, the more effective the vicarious experience's impact would be in creating a strong sense of self-efficacy (Dennis, 1999).

Hoddinott *et al.* (2010) in a longitudinal study with the participation of 418 Scottish women investigated the effect of vicarious experiences on breastfeeding intention. A Seeing Breastfeeding Scale (SBS), developed by the authors, was used on the basis of five attitudes of observing breastfeeding, including feeling embarrassed, uncomfortable, not knowing where to look as well as feeling lovely or not bothered when looking another mother breastfeeding. Mothers who considered the picture of another mother breastfeeding her child a lovely image had about six times greater odds of intending to breastfeed their child than those who provided a negative response to the sight of a mother breastfeeding her infant, irrespective of the age being exposed to this experience. In another study (Kingston, Dennis, and Sword, 2007) that aimed to explore the effect of all four self-efficacy sources of experiences based on the theoretical model of self-efficacy, only vicarious expectations enhanced maternal self-efficacy at 48 hours postpartum. In this descriptive study, mothers that answered positively on the questions on whether they saw pictures or videotapes of other mothers breastfeeding either prenatally or during hospital, had significantly higher levels of breastfeeding self-efficacy at 48 hours after birth. However, the small sample size

(N=63), the fact that this was a homogeneous sample of mainly white (N=53-84.1%), married (N=60-95.2%) women with college/ university education (N=49-77.7%) and of high socioeconomic status (N=51-81%) selected using a convenience sampling procedure as well as the limited observed variability in the study variables (e.g. receiving praise, receiving encouragement about thinking positively about BF experience) might have influenced the lack of association between self-efficacy and the sources of expectations. Interaction with other BF mothers as BF role models empowers mothers to be more confident about themselves that they can overcome BF difficulties. They have the opportunity to share their feeding experiences and enhance their commitment to BF through vicarious experiences (ie. watching other mothers BF their babies) (Fox, McMuller and Newburn, 2015). In a qualitative study by Hoddinott *et al.* (2006), mothers showed a preference of being members of peer groups rather than receiving one-to-one support. Groups provide a sense of control, flexibility and safety for mothers to perform BF in front of others. The plethora of different experiences facilitate maternal decisions on infant feeding practices.

5.2.3 Verbal persuasion

Verbal persuasion is another way of strengthening people's self-efficacy on achieving specific tasks or performances. Appraisal of individuals' performances might influence their self-belief of efficacy, especially if emphasis is given to the successful aspects of performing a behavior, such as praising new and existing breastfeeding skills (Dennis 1999). Mothers that receive appraisal support in the form of encouraging and empowering comments are more likely to enhance their confidence (Leahy-Warren, 2005). Appraisal is commonly considered one of the dimensions of perceived social support, with other dimensions discussed in the literature referring to informational support, tangible, instrumental or practical support, emotional or affectionate support, and positive social interaction (Sherbourne and Stewart, 1991). Appraisal support is probably considered one of the most important aspects of social support that directly influences self-efficacy (Leahy-Warren, 2005) as it provides confirmation that individuals acquire the abilities for succeeding on the given behavior or task (Karademas, 2006). Thereafter, higher levels of perceived abilities are used as guidance for placing greater effort to accomplish a successful outcome (Bandura, 1994). Social

support, either community-based peer or professional based, provided in different forms has immediate influence on the perceived abilities of BM. For instance, mothers that received support from supportive and non judgmental professionals, develop perceived abilities of success by not feeling alone and are able to make their decisions. On the contrary, inadequate and contradictory support might weaken their self-efficacy on their perceived feeding abilities (Fox, McMuller and Newburn, 2015)

5.2.4 Physiological and Affective states

Further to experiences (personal or vicarious) and verbal persuasion through appraisal support, it is theorized that individuals delineate their abilities on the basis of their physical and emotional states while endorsing a behavior. When individuals refer to their abilities as a result of emotional arousal, such as enjoyment and excitement, this enhances their self-efficacy. Negative reactions such as stress, anxiety, pain, fatigue are interpreted as poor performance and, thereafter, these negatively impact self-efficacy levels. Failure to breastfeed might be a result of emotional as well as physiological influences on the “let-down” reflex (Dennis, 1999). An external trigger e.g. suckling, releases oxytocin in the bloodstream which, in turn, will cause the “let-down reflex” by causing contraction of the removal of milk from the breast (Riordan and Wambach, 2010). However, conditions associated with anxiety, stress and pain inhibit the production of oxytocin and, therefore, cause poor breast-milk production described as the “insufficient milk syndrome”. Several studies reported these physiological and emotional responses among the main perceived reasons of breastfeeding discontinuation (Dennis, 2002; Thullier & Mercer, 2009). In contrast, affirmative emotions and thoughts towards breastfeeding, such as satisfaction and enjoyment, have a positive influence in maintaining the behaviour (Bailey, Clark & Shepherd, 2008)

5.3 Influences of Self-efficacy on the Performance of a Behaviour

Self-efficacy can explain or predict a behavior or process on the basis that choice, performance or maintenance of the given behavior is determined by: 1. the outcome expectancy which is the belief that a specific behavior will result to a specific outcome and 2. Self-efficacy which is the perceived ability of the individual to achieve the specific behavior that will consequently result to the corresponding desired outcome

(Bandura, 1977; Strecher *et al.* 1986; Dennis, 2003). Efficacy expectancies (outcome and self-expectancy) are defined by the perceived level of difficulty and individual ability of performing a task and the generalization of efficacy expectations about a particular task to other situations (Bandura, 1994). Self-efficacy expectancy determines holistically the behavior an individual engages in. This includes whether they will initiate the performance of a behaviour, how much effort will be put and the duration of persisting in trying to achieve the desirable outcome when faced with obstacles and whether a person will undertake self-discouraging or self-encouraging perceptions. This is achieved by influencing the thoughts and the actions that will ultimately result to the specific behavior or task through a sequence of four processes. These are: 1. choice of behavior, 2. the amount of effort expenditure and persistence, 3. thought patterns and 4. emotional reactions (Bandura, 1977; Dennis, 1999).

5.3.1 Choice of Behavior

Individuals may commonly reject to be involved in tasks when they perceive not having the abilities to undertake whereas they pursue those tasks they consider themselves more experienced and skilled to perform (Bandura, 1977; Bandura, 1994; Dennis, 1999). Therefore, the choice of performing the behaviour, in this case initiation of breastfeeding, is directly linked to expectancies. Mothers who fail to initiate or establish breastfeeding are not confident enough of having the ability to feed (self-expectancy) and satisfy (outcome expectancy) their baby (Buxton *et al.* 1991; Avery *et al.* 2009). Concerns about their ability to manage with practical issues, possibly accompanied with inconvenience and discomfort (either as a past performance experience or as a result of current physiological and affective states) might also negatively influence the decision to initiate breastfeeding (Avery *et al.* 2009). In contrast, higher levels of self-efficacy during the prenatal period might strengthen maternal commitment on breastfeeding (Creedy *et al.* 2003; Avery *et al.* 2009) which might be further induced with breastfeeding experience (personal or vicarious) along with improvement of breastfeeding abilities irrespective of the obstacles confronted or the lack of support (Avery *et al.* 2009).

5.3.2 *Effort Expenditure and Persistence*

Self-efficacy will influence the amount of effort expenditure and the degree of persistence to accomplish the outcome. Individuals with low levels of self-efficacy are easily discouraged, discontinue the efforts, and therefore fail to succeed. A strong sense of self-efficacy encourages individuals to commit themselves to the activity until they have the desired outcome, irrespective of the difficulties or unsuccessful efforts (Bandura, 1977; Bandura, 1994; Dennis, 1999). Breastfeeding may be considered problem-free and could be initiated automatically without the need of acquiring specific breastfeeding skills that will facilitate the procedure (Burns *et al.* 2010). Nevertheless, obstacles and difficulties such as BF problems (Dennis, 2002; Thulier & Mercer, 2009), almost always arise that will negatively influence the extent to which a mother will expend effort and persist in the behaviour. Mothers empowered and motivated by social support, including maternity care staff, family and friend support (Heidari, Keshvari and Kohan, 2016), mother-to-mother support (Hoddinott *et al.* 2006) will do better in persisting with breastfeeding in the face of obstacles and difficulties (Burns *et al.* 2010).

5.3.3 *Thought Patterns*

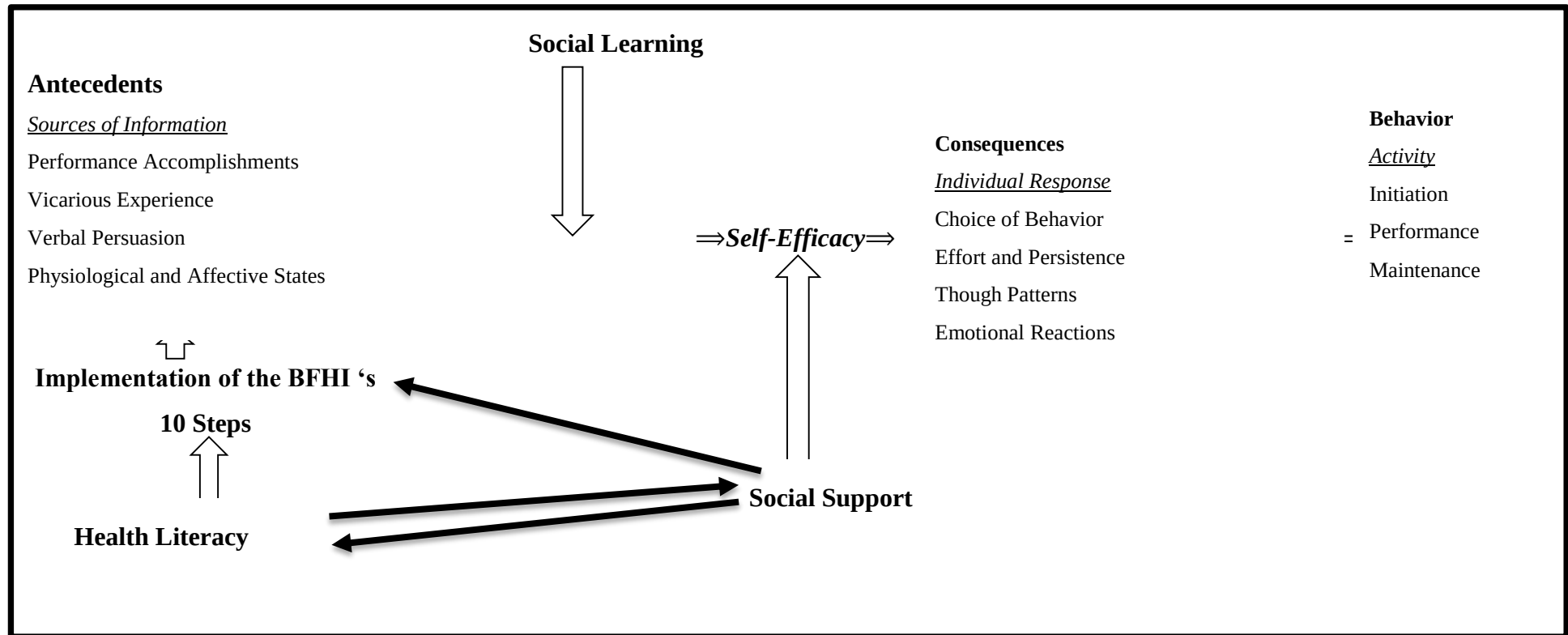
Performance-enhancing thought patterns strengthen an individual's effort and persistence on the activity. A strong sense of self-efficacy maintains high expectations and visions of successful performance on the basis of critical thinking, while a low self-efficacy enables individual to emphasize on deficiencies and focus on failure, guided by their emotions (Bandura, 1977; Bandura, 1994; Dennis, 1999). BF difficulties might be acknowledged as a defeat and a proof of failure as a mother. Negative thoughts are maintained, by lower self-efficacy and give rise to concerns and fear for failing to breastfeed the next child (Palmér *et al.* 2012).

5.3.4 *Emotional Reactions*

Self-efficacy also influences emotional reactions to the performance of the given behavior or task. Individuals with low levels of self-efficacy feel overwhelmed and worried about a task while those with high levels of self-efficacy perceive it as a challenging and empowering activity (Bandura, 1977; Bandura, 1997; Dennis, 1999).

Failure to meet their expectations on BF, mothers feel a sense of worthlessness and guilt and inadequacy for their inability to master the process of BF (Palmér *et al.* 2012; Fox, McMuller and Newburn, 2015).

Figure 5.1: Theoretical Framework of Breastfeeding Self-efficacy



Source: Modified diagram adopted by Dennis (1999) J Hum Lact

5.4 Determinants of Breastfeeding self-efficacy

As mentioned previously a number of different factors might impact on an individual's self-efficacy. These antecedent factors describe the four sources of information which will shape self-efficacy expectancies. A number of determinants of breastfeeding self-efficacy have been described in the literature. These include both socio-demographic characteristics of the mothers as well as the level, type and sources of social support, as well as maternal care practices, to name a few.

Among the socio-demographic factors, only educational status has been consistently associated with BFSE (Dennis, 2006), lending some support to the hypothesis that health literacy is an important determinants of self-efficacy. With regards to parity, findings are inconsistent on the association with BFSE (Dennis, 2006; Hinic, 2016). Most possibly, the inconsistent findings with regards to parity might be attributed to actual previous experience of breastfeeding, as well as whether this previous experience was enjoyable, which is not commonly considered by most studies. It has been shown that multiparous mothers with previous experience are more likely to have higher levels of BFSE than primiparas or multiparous mothers without previous experience (Otsuka *et al.* 2008; Hinic, 2016). However, this can be compensated with the provision of self-efficacy enhancing programs (Noel-Weiss and Cragg, 2006; McQueen *et al.* 2011), positive BF experiences and social support (Burns *et al.* 2010).

Social support is also a significant determinant of BFSE (Dennis, 2006; Leahy-Warren, McCarthy & Corcoran, 2012). Both, professional and lay support enhance maternal BFSE levels (Dennis, 2006, Hinic, 2016). It is accepted that professional support is more effective on improving breastfeeding self-efficacy and breastfeeding outcomes when initiated prenatally but also continued postnatally (Hannula, Kaunonen, and Tarkka, 2008), which however is not commonly the case in many health care systems, including Cyprus due to the lack of formal community support services to breastfeeding mothers.

Professional timely support and instructions during the early postpartum period anticipates potential breastfeeding problems that lead to premature breastfeeding discontinuation (Dennis, 2002; Surgeons' Call, 2011). Health professionals sometimes idealize breastfeeding and, as such, do not prepare mothers for the potential difficulties

they might encounter within the first days (Cliford & McIntyre, 2008). This will have a negative impact on self-efficacy levels (Kingston, Dennis and Sword, 2007) though negative thought patterns and emotional reactions. In a study by Otsuka *et al.* (2008), a positive association between breastfeeding self-efficacy and maternal perception of insufficient milk was reported. In fact, it has been acknowledged that often health professionals might even encourage mothers to discontinue breastfeeding, once they perceive insufficient milk production. This finding emphasizes the importance of the development of breastfeeding management skills on the maintenance of the mothers' belief and confidence in breastfeeding (Sheeshka *et al.* 2001).

Mothers' perceived judgment of their partner's support and positive attitudes towards BF has also been shown to have an important impact towards maternal breastfeeding self-efficacy (Dennis, 2006; Mannion *et al.* 2013; Hinic, 2016) and consequently on BF outcomes (Dennis, 2002). Active and timely partner participation and encouragement has been shown to be positively associated with maternal self-efficacy, irrespective of previous experience (Mannion *et al.* 2013). In fact, the mechanism may involve the actual initiation of breastfeeding, and not simply the successful continuation of breastfeeding. Partners supportive of breastfeeding acknowledge the breast-milk health benefits to both the mother and the infant and this actual support and approval was found to be related with maternal breastfeeding intention (Rempel and Rempel; 2004). On the contrary, ambivalent or negative partner attitudes have adverse effects on maternal BFSE (Mannion *et al.* 2013).

A qualitative study highlighted how paternal involvement and support contributes in successful breastfeeding initiation and continuation from both maternal and paternal perspectives (Tohotoa *et al.* 2009). Some of the themes that emerged from the mothers' descriptions as the main reasons of the role of the father in enhancing maternal confidence and determination to breastfeed include: paternal support on solving BF issues, especially on technical aspects; commitment to BF by acting as BF advocates; emotional support and encouragement; and acceptance of the required time of commitment. Similarly, fathers themselves expressed their need to get actively involved with parenthood and parenting. They emphasized the need to acquire knowledge and learn the role of parenting to enable them to support their partner and provide solutions. (Tohotoa *et al.* 2009).

Maternal mother support can have either enhancing or detrimental influence on breastfeeding self-efficacy since grandmothers, and especially the maternal grandmother, is often the main source of all four forms of support: informational, tangible, emotional and appraisal (Scott and Binns, 1999). Leahy-Warren (2005) reported that appraisal support is the most important form of support associated with confidence of first-time mothers, and this was mainly provided by their partners and their own mothers. This was followed by informational support whereby maternal grandmothers (rather than health professionals) were also the primary source of support. In addition, mothers that interact and receive mother-to-mother support are more likely to have higher levels of maternal self-efficacy (Dennis, 2006). A qualitative study showed that, within a BF supporting peer group, mothers are given a variety of opportunities and vicarious experiences to enhance breastfeeding self-efficacy through empowerment, a sense of control and protection, feelings of security (Hoddinott *et al.* 2006).

With regards of the maternity care practices, formula supplementation was identified as a major determinant of BFSE (Hinich, 2016). Mothers whose infants were supplemented during hospital stay, irrespective of the reason of formula supplementation, had lower BFSE than exclusively breastfed mothers (Koskinen *et al.* 2014). Perceived Insufficient milk production, associated with low BFSE, results to initiation of formula supplementation. Due to infrequent BM feedings, it is followed by an decline in BF production and thereafter to BF discontinuation. Perceived maternal milk insufficiency is the most common reason of BF discontinuation and the main reason of formula introduction (Dennis, 2002; Thulier and Mercer, 2009).

Experience of good maternity care practices based on the “10 steps”, such as early initiation of breastfeeding and rooming-in, are also thought to facilitate the development of breastfeeding skills (Buxton *et al.* 1991) and enhance maternal breastfeeding self-efficacy (Koskinen *et al.* 2014), which it turn will strengthen the maternal commitment to breastfeed (Avery *et al.* 2009). Mothers that room-in are more likely to experience BF on demand and less likely to initiate BF supplementation (WHO, 1998). Early BF initiation within one hour have the highest levels of BFSE, while BF initiation between one and two hours is associated with lowest BFSE (Koskinen *et al.* 2014). Perceived labor experience has also been identified as a determinant of BFSE levels (Dennis, 2006; Hinich, 2016). However, findings on the

effect of mode of delivery on BFSE are inconsistent. While, in a longitudinal study conducted by Dennis (2006) cesarean section had a negative impact on BFSE, another study showed no association (Hinic, 2016). Mothers that give birth with a cesarean section are more likely to delay BF initiation and therefore have lower levels of BFSE (Koskinen *et al.* 2014). A number of other obstetric care characteristics including the active involvement in labor decisions and postpartum care have been associated with BFSE levels (Dennis, 2006).

Pleasant perceived breastfeeding experience was also associated with higher BSES scores (Dennis *et al.* 2006; Koskinen *et al.* 2014). On the other hand, mothers who reported experiencing embarrassment and inconvenience while breastfeeding in public have lower BFSE than those who did not (Sheeshka *et al.* 2001).

A negative association was established between maternal self-efficacy and postnatal depression (Dennis, 2002; Leahy-Warren, Mc Carthy and Corcoran, 2012). However, family support enhances maternal self-efficacy, by positively influencing maternal mental health (Warren-Leahy and Mc Carthy, 2011; Warren-Leahy, Mc Carthy and Corcoran, 2012).

5.5 Operational Definitions of Breastfeeding self-efficacy

A number of tool have been developed to measure breastfeeding self-efficacy. By far the most commonly used tool in the literature is the Breastfeeding self-efficacy scale (BSES) by Dennis and Faux (1999). A recently published article identified and critically reviewed six tools that measure breastfeeding self-efficacy (Tuthill *et al.* 2016). The next section will briefly describe the BSES, which was used in the context of this thesis, as well as other tools in the literature that measure breastfeeding self-efficacy. **Table 5.1** presents the main characteristics of these tools.

5.5.1 Breastfeeding Self-Efficacy Tools

5.5.1.1 Breast-Feeding Self-Efficacy Scale

The Breastfeeding Self-Efficacy Scale (BSES) was developed by Dennis & Faux (1999) on the basis of Bandura 's (1977) Social learning theory. It is a self-report instrument composed of 33 items each of which is measured on a 5-point Likert scale, All items are presented positively and are preceded with the phrase "I can always...". The response scale is anchored at the two ends of the scale with 1 representing "not at all confident" and 5 representing "always confident". The total score of the tool ranges from 33 to 165, with a higher score denoting higher levels of breastfeeding self-efficacy.

In its long-form, it is composed of three dimensions: the technical component, which assesses the action that a mother performs and the specific tasks she should execute that will result to successful breastfeeding; the intrapersonal thoughts component, which involves the maternal perceived attitudes and beliefs; and the interpersonal aspects and support, which refer to the four forms of perceived support that is available to the mother and will assist in succeeding in the process of breastfeeding: informational, emotional, appraisal and instrumental assistance.

The tool was designed to measure postpartum maternal breastfeeding self-efficacy. It is thought as a form of screening tool to identify mothers at high risk of premature discontinuation. However, several studies have used the BSES scale to measure breastfeeding self-efficacy during pregnancy or both pre- and postnatally in order to

compare how breastfeeding self-efficacy is modified during the transition to motherhood and to examine its association with breastfeeding initiation, duration and exclusivity. The BSES scale is the most frequently used tool for evaluating maternal self-efficacy among various women populations of different age groups, different ethnicities and of different socio-demographic characteristics. Its psychometric characteristics were assessed in several populations (Dennis and Faux, 1999; Creedy *et al.* 2003; Dai and Dennis, 2003; Oria *et al.* 2009; Eksioglu and Ceber, 2011) and it has been translated into several languages, including Turkish (Eksioglu and Ceber, 2011), Chinese (Dai and Dennis, 2003) and Portuguese (Oria *et al.* 2009) to name a few.

5.5.1.2 Breast-Feeding Self-Efficacy Scale- Short Form

The BSES- short scale (Dennis, 2003) includes only 14 of the 33 items included in the original BSES form, and is thus based on the same theoretical framework. It is measured on the same 5-point Likert-type scale as the original scale of BSES with 1 denoting “not at all confident” and 5 “very confident”. Assessment of its psychometric measures indicated that it can be valuable tool for both clinical use to identify mothers at high-risk for not initiating or early discontinuation of breastfeeding as well as for the evaluation of breastfeeding and breastfeeding confidence-enhancement interventions (Dennis, 2003).

Items in the short-form are thought of tapping into a technical component (i.e. the activities performed by the mother and the completion of specific tasks necessary for successfully initiation and continuation of breastfeeding) and a cognitive component (maternal beliefs and attitudes with regards of breastfeeding experience), even though most commonly the tool has been used as a unidimensional scale by most previously published studies. The internal consistency of the items as measured by Cronbach’s coefficient alpha was very high in the original study (0.97). The short-form of the BSES has been translated in many languages and validated in several populations worldwide, including Turkish (Tokat *et al.* 2010; Eksioglu and Ceber, 2011), Italian (Petrozzi and Gagliardi, 2016), Polish (Wutke & Dennis, 2007), Hong Kong Chinese (Ip *et al.* 2012); Spanish (Oliver Roig *et al.* 2012), Croatian (Pavicic Bosnjak *et al.* 2012), Chinese (Dai and Dennis, 2003), Portuguese (Dodt *et al.* 2012; Zurbaran *et al.* 2010) and Swedish (Gerhardsson *et al.* 2014).

5.5.1.3 Prenatal Breastfeeding Self-efficacy Scale

Developed by Wells *et al.* (2006) the Prenatal Breastfeeding Self-efficacy Scale (PBSES) was specifically intended to be used for assessing maternal perceived breastfeeding self-efficacy during the prenatal period. It comprises of 20 items measured on a 5-point Likert-type scale with 1 representing “*not at all sure*” and 5 “*completely sure*” with a theoretical score ranging from 20 to 100. It was, also, developed on the basis of Bandura’s Social Cognitive Theory. Internal Consistency suggested adequate reliability with Cronbach’s $\alpha=0.89$. The tool was initially comprised of four themes: 1. confidence regarding the skills and demands required for breastfeeding or using pump for extracting breast milk, 2. confidence on the ability to gather information on how to breastfeed, 3. confidence on breastfeeding around other individuals and feelings of embarrassment during breastfeeding, 4. confidence with regards of social pressure during breastfeeding. The psychometric characteristics of the tool were subsequently tested among Spanish women (Piñeiro-Albero *et al.* 2013). According to Tuthill E *et al.* (2016), one of the strengths of the PBSES pertains to the fact that, unlike other tools, it includes several items regarding comfort of breastfeeding around people. For instance, the BSES includes only one such item, and it only refers to family members, and not breastfeeding in public (“I can always comfortably breastfeed with my family members present”). Comfort to breastfeed in social situations or in public might be very relevant to a mother’s breastfeeding self-efficacy for many women and in many contexts.

5.5.1.4 H & H Lactation Scale

The H & H Lactation scale is a self-report instrument, developed by Hill and Humenick (1996) to specifically measure maternal perceptions of insufficient milk supply, rather than overall aspects of breastfeeding self-efficacy in general. Nevertheless, a description of the tool has been included in this section since it was also included in Tuthill E *et al* review (Tuthill *et al* 2016), but also because it is recognized that perceived Insufficient Milk Supply, may be one of the main determinants of breastfeeding self-efficacy through negative thought patterns and emotional reactions. Development of the H & H scale was based on a conceptual framework of Insufficient

Milk Supply (IMS), which focuses on a number of antecedents of perceived maternal insufficient milk production. Those are thought to be direct: such as breastfeeding behavior (frequency and duration), psychological factors including maternal attitudes and knowledge towards breastfeeding and physiological factors such as maternal age and health status; or indirect such as: maternal time restraints (employment and family), sociocultural factors (e.g. education and support), maternal comfort factors (e.g. lactation problems) and infant factors (e.g. birth weight).

It is composed of three sub-scales (indicators of perceived IMS): 1. maternal confidence/ commitment to breastfeeding (10 items), 2. Perceived infant breastfeeding satiety (5 items), and 3. Maternal-infant breastfeeding satisfaction (5 items). All items are measured on 7-likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total score of the tool ranges from 20 to 140, with a higher score denoting of positive perceived breastfeeding experience and greater maternal satisfaction. Reliability of the scale was found to be high in the original study (Cronbach's $\alpha = 0.96$). The H & H scale was used in two studies (Creedy *et al.* 2003; Punthmatharith and Singh, 2005). In one of the two studies, the psychometric properties of the scale was assessed among Thai mothers (Punthmatharith and Singh, 2005). In the other study conducted in Australia, only the maternal commitment/confidence subscale of the tool was used (Creedy *et al.* 2003).

5.5.1.5 Infant Feeding Intentions Scale

The Infant Feeding Intentions Scale (IFIS) was developed by Nommsen-Rivers & Dewey (2009). The scale taps on the infant feeding intentions of mothers during pregnancy, giving emphasis on their intentions to exclusive breastfeeding. Like the PBSES and the BPEBI (described below), this tool was developed for use in the prenatal period (Tutthill *et al.* 2016). It was grounded on the Theory of Planned Behavior and Theory of Reasoned Action. According to this theory, beliefs determine behavioral intentions which are highly related with the actual behavior (Ajzen, 1985). The authors incorporated both dimensions of exclusive breastfeeding intention, which are the strength of the intention to initiate BF (2 items) and the strength to EBF at first, third and sixth month (3 items). To assess breastfeeding behavior, the Stages of Change Model was used. The model describes breastfeeding behavior in terms of mothers

readiness to achieve their intentions in five phases from precontemplation to action. Each phase is delineated by statements that indicate the stage that describe breastfeeding behavior. For example, pre-contemplation is represented by statements such as “*I am going to bottlefeed my baby*” and “*I do not want to breastfeed at all*”, contemplation by “*I am thinking about breastfeeding, but I am not sure I want to do it*”, preparation “*I plan to try breastfeeding, but I am not sure how long I will do it*”, action by statements such as “*I plan to breastfeed for at least one month but no for 6 months*” and maintenance by phrases such as “*I plan to breastfeed my baby for at least 6 months*” (Humphreys *et al.* 1998; Nommsen-Rivers and Dewey 2008). The 5 items, each representing one of the 5 phases, are measured at 5-likert scale with 0 denoting “very much disagree” to 4 “denoting very much agree”. A total score of 0 indicates of a very strong intention not to BF at all and a total score of 16 represents of a very strong intention to EBF through the six months (Nommsen-Rivers and Dewey, 2008).

5.5.1.6 Breastfeeding Personal Efficacy Beliefs Inventory

The Breastfeeding Personal efficacy Beliefs Inventory (BPEBI) was developed by Cleveland and McCrone (2005) to measure breastfeeding confidence that will predict breastfeeding initiation and duration during the first 12 months among pregnant women. In contrast to Dennis & Faux (1999) BSES scale, the BPEBI was developed to identify mothers that are risk of not initiating breastfeeding. It was, also, grounded on Bandura ‘s Social Theory. It measures self-efficacy with 25 visual analog scale items from 0% which represents “*cannot do*” to 100% that denotes “*certain can do*”. The overall score is generated by calculating the mean of a participant’s item score. Similar to BSES scale, each item was positively worded beginning with the phrase “*I can...*”. Internal consistency in the original scale was 0.89. No studies were found to use this tool to measure breastfeeding confidence.

Table 5.1: *Breastfeeding Self-Efficacy Measurement Tools*

Tool	Developer	Country	Scale (Items/ scale)	Scores/ Range	Components	Theoretical Framework
Breastfeeding self-efficacy scale (BSES)	Dennis & Faux (1999)	Canada	33 items 5 –likert 1-Not at all confident to 5- always confident	Higher scores indicate higher levels of BFSE 33-164	1. Technique 2. Interpersonal thoughts 3. Support	Bandura’s Social Cognitive Theory
Breastfeeding self-efficacy scale short form	Dennis (2003)	Canada	14 items 5 –likert Not at all confident to always confident	Higher scores indicate higher levels of BFSE 14-70	1. Technique 2. Cognitive aspects	Bandura’s Social Cognitive Theory

Tool	Developer	Country	Scale (Items/ scale)	Scores/ Range	Components	Theoretical Framework
Infant Feeding Intentions scale (IFI scale)	Nommsen-River & Dewey (2009)	USA	5 items 4-likert Very much agree/very much disagree	Items are multidimensional Scoring estimated by the average of items from 0 (no intention) to 16 (very strong intention) The higher the score the greater the intention (thus the	NA	Theory of Planned Behavior & Theory of Reasoned Action/ Stages of Change for Breastfeeding
H & H Lactation Scale	Hills & Humenick 1996	USA	20 (OR 30) items 7 –likert Strongly disagree/ strongly agree	The higher the score the more confident the mother feels about the BF experience 30-120	1. Maternal Confidence/ commitment to BF 2. Perceived infant satiety 3. Maternal- infant BF Satisfaction	Hills & Humenick's Insufficient Milk Supply Conceptual Framework

Tool	Developer	Country	Scale (Items/ scale)	Scores/ Range	Components	Theoretical Framework
Prenatal Feeding Intentions Scale (PBSES)	Wells <i>et al.</i> 2006	USA	20 items 5 likert scale not at all sure/ completely sure	The higher the score the higher the levels of self-efficacy 20-100	1. Skills and demands 2. Information about breastfeeding 3. Breastfeeding in public 4. Social Pressure	Bandura ‘s Social Cognitive Theory
Breastfeeding Personal Efficacy Beliefs Inventory (BPEBI)	Cleveland & McCrone, 2005	USA	25 items Visual analogue scale (0-100%) 0% -“cannot do” to 100%-“certain can do”	The higher the mean score (from 0% to 100%) the higher the levels of self-efficacy	1. Duration 2. Technique 3. Motivation 4. Different Environments 5. Possible challenges	Social Cognitive Theory

Modified by Turnhill *et al.* (2017)

Chapter 6

Systematic Review of the association between BF self-efficacy and BF outcomes

The previous chapter addressed the theory of self-efficacy in the context of breastfeeding and the operational definition of breastfeeding self-efficacy in a number of tools developed to measure the perceived self-efficacy for breastfeeding either during pregnancy or postnatally. Since the association between breastfeeding self-efficacy and actual breastfeeding behaviour is at the core of this thesis, this chapter will present the findings of a systematic review of studies that investigated this association. The chapter presents the aims and the objectives (**Section 6.1**), provides a detailed description of the methods, search strategy, inclusion and exclusion criteria (**Section 6.2**), and finally presents and discusses the results (**Section 6.3**) on the association between maternal breastfeeding self-efficacy and breastfeeding.

6.1 Aims and Objectives

The aim was to conduct a systematic search and review of the literature in SCOPUS for observational studies of any design (descriptive cross-sectional, case-control, prospective or methodological) published in the period Jan 2007-May 2017 that have investigated the association between maternal breastfeeding self-efficacy (BFSE) and breastfeeding outcome referring to initiation, continuation and/or exclusivity.

Specifically, the review aimed

- To examine the association of BFSE with BF and EBF initiation
- To examine the extent to which BFSE is related with continuation of BF and EBF
- To also examine the extent to which successful BF establishment influences maternal BFSE in the long –run in order to assess the hypothesized bi-directional association of BF and maternal BFSE.

6.2 Methods

6.2.1 Search Strategy

A search strategy was developed to identify studies that investigated the association between maternal BFSE and BF initiation, duration and exclusivity. A number of keywords were selected for the search which were combined with the use of the operator OR (to define alternative use of the construct of interest i.e. breastfeeding and breastfeeding self-efficacy) and the operator AND (to identify studies which contained both terms). The search was carried out in the SCOPUS database for the period between 2007 - May 2017 and was limited to the identification of the predetermined keywords in the “Article title, Abstract, or Keywords” of the studies. Specifically, a list of keywords was used to identify studies that investigated infant feeding practices, without restricting the search to breastfeeding as general terms such as “infant feeding” or even “bottle” and “formula feeding” were used. Then, a second list of keywords was used for the identification of the studies on maternal breastfeeding self-efficacy. Since a number of studies might use the term “confidence” rather than self-efficacy, this was included in the search. Finally, the search was conducted to combine the common hits in the two previous searches. **Table 6.1** presents the terms and hits obtained from each search.

Table 6.1: Search items used for the search strategy to identify studies that investigated the association of BFSE and BF initiation, duration and exclusivity indexed in the SCOPUS database

Search Terms	No of articles
1. Breastfeeding OR Breast-feeding OR breastfed OR “Infant feeding” OR “Breast feeding” OR “formula feeding” OR “Bottle feeding” OR “Maternal Feeding” OR formula OR breastmilk OR breast milk OR breast-milk	51144
2. Self-efficacy OR self-confidence OR maternal breastfeeding self-efficacy OR maternal breastfeeding efficacy OR maternal breastfeeding confidence OR maternal breastfeeding self-confidence OR breastfeeding self-confidence	48516
#1 AND # 2 (no time of publication restrictions)	286

The search identified 286 articles. Indicatively, of these 286 articles, only 20 were published prior to 2000 and 41 were published in the period 2000-2006. Thus, 225 (79%) of the identified studies were published in the last 10 years. The abstracts of all articles

published post-2007 were obtained and reviewed based on a set of eligibility criteria. Two researchers participated in the process of identifying the articles that would be considered further, according to the pre-defined set of eligibility criteria aligned with the aims of the systematic review. The first was the doctoral student and the second was the main supervisor. Before the commencement of the identification process, the two researchers came into agreement with regards to the interpretation and implementation of eligibility criteria. The two researchers identified the eligible articles independently by applying the eligibility criteria and any disagreement was resolved via discussion and consensus. The systematic review protocol was developed in order to facilitate the process. The eligibility criteria are also briefly mentioned here.

6.2.2 *Eligibility Criteria*

Inclusion criteria

- Only original studies published in English or Greek
- Articles reporting original research,
- Studies irrespective of design which may include
 - descriptive comparative (e.g. levels of MBSE according to BF status) or correlational (e.g. correlation between MBSE and duration of BF) studies,
 - observational cross-sectional (i.e. MBSE and BF measured at the same time, most likely at birth/48 hours) or prospective studies (i.e. measured MBSE and BF at different times, either MBSE prenatally/at birth and BF at subsequent follow-up, or alternatively, breastfeeding initiation and/or continuation and MBSE at subsequent follow-up with repeated measures in order to address the hypothesized bi-directional association of BF and maternal BFSE)
 - Methodological studies measuring the metric properties (validity or/and reliability) of BFSE tools as long as they also examined the association of BFSE with BF peripartum or its predictive validity on BF status postpartum.
- Studies where BFSE is considered an independent variable of BF outcomes
- Studies that measured and assessed maternal BFSE with the use of a valid and reliable instrument that reflects the multi-dimensional concept of interest, during pregnancy, at birth and lactation, either once or repeated measures

- Studies that included any BF variable (e.g. initiation, exclusivity, duration or discontinuation), measured at any time point, irrespective of the definition or methods of BF measurements (e.g. 24hrs recall, self-reported status, retrospective etc) and irrespective of whether outcomes of interest are expressed as prevalence, ORs, mean length of BF duration, month of discontinuation etc.
- No restrictions in terms of country of origin and sample characteristics with regards to general socio-demographic characteristics of interest to the study (e.g. ethnicity, place of residence, parity, income status)

Exclusion Criteria

- Published prior 2007
- Any language other than English or Greek
- Reviews, editorials, opinion pieces, letters and study protocols
- Descriptive or observational studies where maternal BFSE was the dependent variable or BFSE was the only outcome of interest, rather than BF
- Methodological studies measuring the metric properties (validity or/and reliability) of BFSE tools (measurement scales), unless they also examined the association of BFSE with BF, for example its predictive validity on BF status either peripartum or postpartum.
- Studies that measured maternal BFSE with the use of single items or a few items, rather than a scale measurement, or alternatively studies that used a scale without assessing the validity/ reliability of the tool
- Studies that only measured intention to BF (but not actual BF outcomes)
- Studies that measured other concepts related to breastfeeding self-efficacy (e.g. maternal self-confidence in infant care, self-determination, breastfeeding effectiveness or maternal control) or general self-efficacy
- Studies of observational or intervention design, which measured maternal BFSE once or several times but did not investigated an association with BF outcomes
- Studies of retrospective design unless maternal BFSE was measured at the time of interest and not if assess retrospectively
- Studies targeting specific population sub-groups of not direct relevance to the aims of the study (e.g. HIV-patients, partner violence etc). Those defined by ethnicity, parity status, place of residence and/ or age were considered for inclusion.

Furthermore, intervention and qualitative studies were not considered as part of this review.

- It is expected that a number of intervention studies may have included measuring breastfeeding self-efficacy as a potential mediator for improving breastfeeding outcomes. Nevertheless, due to multitude of published breastfeeding interventions of a different nature (e.g. health care services or organizational-based, education-based, counselling or support-based) and in different settings (maternity care setting, community, workplace etc), these were not considered here. Intervention studies for promoting breastfeeding have been extensively reviewed in the past (Renfrew *et al* 2012; Skouteris *et al* 2014). Several of the breastfeeding support interventions, and in particular those based on the use of lay or peer community support are based on social learning theories. Nevertheless, as also noted by previous reviews, it seems that only a small subset of the intervention studies include a measure of breastfeeding self-efficacy in their study outcomes (Noel-Weiss *et al* 2006; Wilhelm *et al* 2006; McQueen *et al* 2011), even though it is the central concept of the theory. Any intervention studies of interest as (a) they were based on social learning and self-efficacy theory or specifically designed to affect self-efficacy and (b) looked at self-efficacy as mediator of the effect of intervention on breastfeeding behaviour, will be discussed in the Discussion part of this thesis.
- Qualitative studies were also not considered as part of this review, which focused exclusively on studies that quantitatively assessed breastfeeding self-efficacy with the use of psychometric scales. Any relevant qualitative studies identified as part of the search strategy, which can inform the understanding of breastfeeding self-efficacy as component of the breastfeeding experience will be provided in the Discussion part of this thesis.

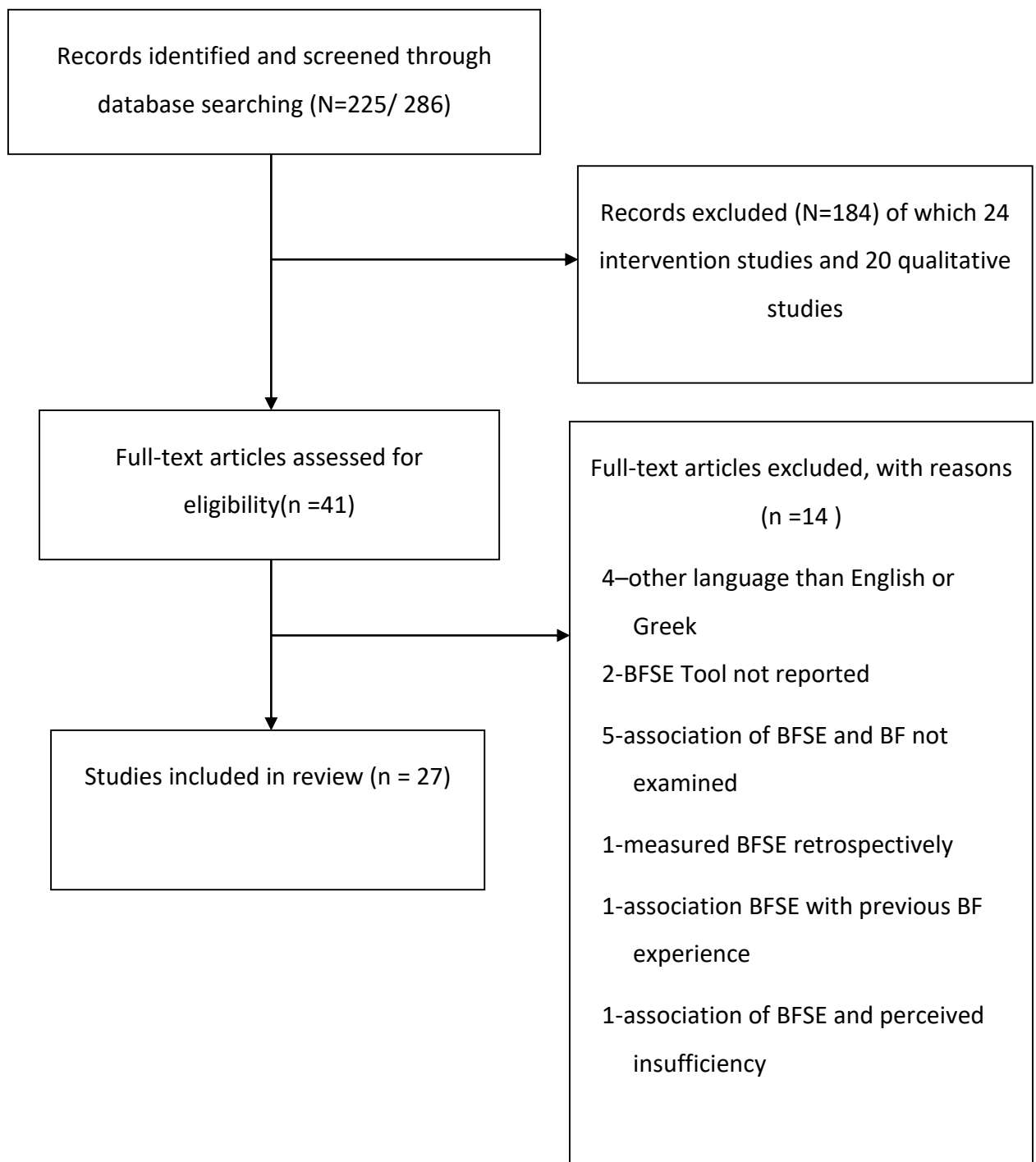
6.3 Results

A total of 225 of the identified studies were published in the period 2007-2017. One hundred and eighty four (184) studies were excluded from reading the title/abstract as they were not relevant to the study question. Furthermore, 24 of the identified studies were interventions and 20 were qualitative studies and were not considered further. Among the rest of the studies, 41 observational studies were reviewed further.

Four were excluded because they were published in other languages than Greek or English (Lopis-Rabout-Courday, 2011; Bosnjak *et al.* 2014; Degrande *et al.* 2015; Uchoa *et al.* 2017) Of the remaining 36 articles, nine were rejected as they were considered that they did not fulfill the eligibility criteria. In two studies, the measurement tool for breastfeeding self-efficacy was not reported (Minas *et al.* 2016; Karall *et al.* 2015), in five studies the association of BFSE and BF was not examined (Pincombe *et al.* 2008; Zubaran and Foresti, 2013; Uchoa *et al.* 2014; Alus Tokat *et al.* 2015; Rodrigues *et al.* 2017), one study only measured BFSE retrospectively (i.e. based on recall) (De Jager *et al.* 2014), one study measured the association between BFSE and previous BF experience (Kronborg *et al.* 2007) and one study measured the association of BFSE and perceived insufficient milk (Otsuka *et al.* 2008)

Figure 6.1 outlines the flow diagram of studies included in this systematic review.

Figure 6.1: *Flow Diagram of Studies included in the Systematic Review*



To facilitate the presentation, studies were classified into two categories on the basis of their objectives: 1. Primarily methodological studies i.e. studies mainly investigating the psychometric properties of a maternal breastfeeding self-efficacy tool, and specifically its concurrent (e.g. initiation, exclusivity) or its predictive validity (e.g. long-term breastfeeding outcomes) (**Section 6.3.2**) and 2. descriptive or observational studies, which primarily aimed at investigating the association of maternal breastfeeding self-efficacy (BFSE) and BF initiation, duration and exclusivity (**Section 6.3.3**). Furthermore, within each category, studies were discussed in terms of the time of measurement of maternal breastfeeding self-efficacy, namely 1. antenatally, 2. postnatally and 3. both antenatally and postnatally. **Tables 6.2 (a), (b)** and **Tables 6.3 (a), (b)** provide a detailed description of the characteristics and findings of the articles included in the review (**Appendix B**).

6.3.1 General Characteristics of the Studies included in the Systematic Review

Of a total of twenty-seven studies considered to fulfill the eligibility criteria, the vast majority (twenty-five in total) used the Breastfeeding Self-Efficacy Scale (BSES-scale) developed by Dennis & Faux (1999) to assess maternal breastfeeding self-efficacy (BFSE) levels. Twenty used the short version of the BSES scale (Gregory *et al.* 2008; O' Brien, Buikstra and Hengney, 2008; Ip *et al.* 2012; McQueen *et al.* 2013; McQueen *et al.* 2015; Loke and Chan, 2013; Pavicic Bosnjak *et al.* 2012; Petrozzi and Gagliardi, 2016; Glassman *et al.* 2014; Wutke and Dennis, 2007; Alus Tokat *et al.* 2010; Eksioglu and Ceber, 2011; McCarter-Spaulding and Dennis, 2010; Dennis *et al.* 2011; Oliver-Roig *et al.* 2012; Wheeler and Dennis, 2013; Mossman *et al.* 2008; Zubaran and Foresti; 2013; Koskinen *et al.* 2014; Hinic, 2016). Only two studies used some other tool to measure breastfeeding self-efficacy, namely the PBSES, which was designed to measure self-efficacy during pregnancy and was described above, (Pineiro- Albero *et al.* 2013) and the Breastfeeding Attrition Predictive Tool - BAPT (Yu *et al.* 2014), which is not actually a measure of breastfeeding self-efficacy but contains elements of it.

The BAPT, developed and tested by Janke (1992, 1994), is based on the Theory of Planned Behavior (Ajzen, 1991), which is composed of three constructs: attitudes, subjective norm and control. Attitude refers to the “*beliefs concerning to the consequences of a given behavior multiplied by the evaluation of the consequences*”. Subjective control was defined as “*an individual's belief that another person wants her to perform, or not to perform, a given behavior, multiplied by the individual's self-reported motivation to*

comply with that person's desires". Finally, control was defined as "*perceptions of having control over internal and external constraints*" (Dick *et al.* 2002). In contrast to the other tools, the BAPT can identify women at risk for early weaning. It is composed of 49 items measured at a 5-Likert scale that are divided into four subscales: (1) the Positive Breastfeeding Sentiment (PBS), (2) Negative Breastfeeding Sentiment (NBP), (3) Social and Professional Support and (4) Control. The PBS and NBS subscales measure the construct of attitudes and include of 18 positive and 9 negative items, respectively. The Social and Professional Support scale measures subjective norm and it is composed of a list of individuals or groups of individuals (e.g. baby's father, grandmother, doctor, midwife etc). The control subscale includes 12 items that assess mother's predicted ease or difficulty to BF (Dick *et al.* 2002).

Twelve studies were of primarily methodological design that aimed to investigate the psychometric characteristics of the scale used to assess BFSE; however all investigated the association of BFSE with either concurrent breastfeeding outcomes or long-term breastfeeding outcomes, as per the eligibility criteria. These were studies translating the original Breastfeeding Self-Efficacy Scale (BSES-scale) in different languages; including Turkish (Tokat *et al.* 2010; Eksioglu and Ceber, 2011), Italian (Petrozzi and Gagliardi, 2016), Polish (Wutke and Dennis, 2007), Hong Kong Chinese (Ip *et al.* 2012); Spanish (Oliver Roig *et al.* 2012; Pineiro-Albero *et al.* 2013), Croatian (Pavicic Bosnjak *et al.* 2012); or assessing the maternal breastfeeding self-efficacy levels in special subgroups of women with specific characteristics; for instance, primiparas (Semenic *et al.* 2008; Wilhelm *et al.* 2008; Ku and Chow, 2010; Tsai *et al.* 2015), adolescents (Mossman *et al.* 2008; Dennis *et al.* 2011), of African descent (McCarter-Spaulling and Dennis, 2010), of Spanish origin (Linares *et al.* 2015), of diverse ethnicity (Gregory *et al.* 2008), low income minorities (Glassman *et al.* 2014) and of north American native origin (McQueen *et al.* 2013). Nine studies assessed the psychometric characteristics of the short form of the BFSE scale (Wutke and Dennis, 2007; Gregory *et al.* 2008; Alus Tokat *et al.* 2010; McCarter-Spaulling & Dennis, 2010; Dennis *et al.* 2011; Ip *et al.* 2012; Pavicic Bosnjak *et al.* 2012; Oliver Roig *et al.* 2012; McQueen *et al.* 2013).

Of the descriptive or observational studies, four had a longitudinal design (Semenic *et al.* 2008; O'Brien *et al.* 2008; Tsai *et al.* 2015; Linares *et al.* 2015); five were prospective cohort studies (Baghurst *et al.* 2007; Gregory *et al.* 2008; Yu *et al.* 2014; McQueen *et al.* 2015; Petrozzi and Gagliardi, 2016), three were cross-sectional studies (Ku and Chow,

2010; Zubaran and Foresti, 2013; Koskinen *et al.* 2014), two studies were descriptive correlational (Loke and Chan, 2013; Hinic, 2016), one study was prospective correlational (Mossman *et al.* 2008) and one performed a secondary analysis using a prediction model (Wilhelm *et al.* 2008) with data from a longitudinal experimental two-group design (Wilhelm *et al.* 2006).

Only seven studies measured breastfeeding self-efficacy at more than one time points; three studies both antenatally and postnatally (Mossman *et al.* 2008; Tokat *et al.* 2010; Dennis *et al.* 2011) and four studies postnatally (Semenic *et al.* 2008; Wilhelm *et al.* 2008; Eksioglu and Ceber, 2011; Petrozzi and Gagliardi, 2016). Of the studies that measured maternal BFSE levels only once, the majority measured it perinatally or postnatally; only in two studies it was assessed antenatally (Yu *et al.* 2014; Peneiro-Albero, 2013). It is of note that these are the two studies that used a tool other than the Breastfeeding Self-Efficacy Scale (BSES-scale). Five studies examined the association of maternal BFSE with BF/EBF duration up to the sixth month (Semenic *et al.* 2008; Ip *et al.* 2012; Pavicic-Bosnjak *et al.* 2012; Baghurst *et al.* 2007; Wilhelm *et al.* 2008; Tsai *et al.* 2015) whereas all the other studies examined the association of maternal BFSE on BF duration within a period of the first three weeks to a maximum of three months postpartum.

In terms of defining breastfeeding outcomes, ten studies used the IGAB BF definitions developed by Labbok and Krasovec (1990) (Gregory *et al.* 2008; McQueen *et al.* 2013; Tokat *et al.* 2010; Tsai *et al.* 2015; Semenic *et al.* 2008; McQueen *et al.* 2015; Pavicic-Bosnjak *et al.* 2012; Ip *et al.* 2012; McCarter-Spaulding and Dennis, 2010; Dennis *et al.* 2011) and five studies used the WHO definitions (WHO 1998; WHO 2008) (Baghurst *et al.* 2007; Loke and Chan, 2013; Yu *et al.* 2014; Linares *et al.* 2015; Petrozzi and Gagliardi, 2016). Seven studies did not provide any indication on which of the existing operational definitions were used for operationalizing breastfeeding practices (Ku and Chow, 2010; Eksioglu and Ceber, 2011; Zubaran and Foresti, 2013; Wheeler and Dennis, 2013; Peneiro-Albero *et al.* 2013; Koskinen *et al.* 2014;).

Of the twenty seven studies reviewed, twenty examined the association of maternal BSE on EBF status (Wutke and Dennis, 2007; Semenic *et al.* 2008; Gregory *et al.* 2008; McCarter – Spaulding and Dennis, 2010; Ku and Chow, 2010; Eksioglu and Ceber, 2011; Tokat *et al.* 2010; Dennis *et al.* 2011; Pavicic- Bosnjak *et al.* 2012; Ip *et al.* 2012; McQueen *et al.* 2013; Loke and Chan, 2013; Zubaran and Foresti, 2013; Peneiro-Albero, 2013; Glassman *et al.* 2014; Tsai *et al.* 2015; Yu *et al.* 2014; Koskinen *et al.* 2014; Linares

et al. 2015; McQueen *et al.* 2015) and seven studies the association of maternal BSE with any BF/BF (O' Brien *et al.* 2008; Wilhelm *et al.* 2008; Mossman *et al.* 2008; Semenik *et al.* 2008; Tokat *et al.* 2010; Eksioglu and Ceber 2011; Pineiro-Albero *et al.* 2013). Seven studies clearly state that they employed the 24-h recall method to measure breastfeeding status (Wutke and Dennis, 2007; Gregory *et al.* 2008; Tokat *et al.* 2010; McCarter-Spaulding and Dennis, 2010; Ip *et al.* 2012; Yu *et al.* 2014; Tsai *et al.* 2015). In the rest of the studies, the method used is not clearly stated, however, it is more likely to be based on self-reported current status in studies that report their findings in terms of prevalence of mothers still breastfeeding at different time-points (e.g. 3 months), while studies that report their findings in terms of duration or discontinuation of breastfeeding, it is very likely that a retrospective calendar method was employed (i.e. asking mothers to report when they discontinued breastfeeding). It is not clear how BF was measured in the majority of the studies, but it is most likely to be based on the self-reported method.

Eighteen studies recruited a convenience sample from a specific maternity care facility (Wutke & Dennis, 2007; Semenik *et al.* 2008; Wilhelm *et al.* 2008; Mossman *et al.* 2008; McCarter – Spaulding and Dennis, 2010; Ku and Chow, 2010; Tokat *et al.* 2010; Dennis *et al.* 2011; Pavicic- Bosnjak *et al.* 2012; Oliver-Roig *et al.* 2012; Peneiro-Albero, 2013; McQueen *et al.* 2013; Wheeler and Dennis, 2013; Zubaran and Foresti, 2013; Linares *et al.* 2015; Hinic, 2016; Koskinen *et al.* 2014; Glassman *et al.* 2014), one study reported recruiting a purposeful sample from two BFHI-designated hospitals, one located in the metropolitan city of Taiwan and the other one in suburban (Tsai *et al.* 2015) and another recruiting of a sample of volunteers (Yu *et al.* 2014). The rest of the studies did not report of the sampling procedure (Baghurst *et al.* 2007; O'Brien *et al.* 2008; Gregory *et al.* 2008; McCarter-Spaulding and Dennis, 2010; Eksioglu and Ceber 2011; Ip *et al.* 2012; McQueen *et al.* 2013; Petrozzi and Gagliardi, 2016). In terms of the sample size in these studies, this ranges from 73 (Wilhelm *et al.* 2008) to 2400 (Yu *et al.* 2014).

In terms of the geographical coverage of these studies, six studies were conducted in Canada (Mossman *et al.* 2008; Semenik *et al.* 2008; Dennis *et al.* 2011; Wheeler and Dennis, 2013; Mc Queen *et al.* 2013; Mc Queen *et al.* 2015), five in the US (McCarter-Spaulding and Dennis, 2010; Wilhelm *et al.* 2008; Glassman *et al.* 2014; Linares *et al.* 2015; Hinic, 2016), three in Hong Kong (Ku and Chow, 2010; Ip *et al.* 2012; Loke and Chan, 2013), two in Australia (Baghurst *et al.* 2007; O'Brien *et al.* 2008), two in Turkey (Tokat *et al.* 2010; Eksioglu and Ceber, 2011) and two in Spain (Oliver Roig *et al.* 2012;

Pineiro-Albero *et al.* 2013), and one in each of the following countries: Poland (Wutke and Dennis, 2007), Croatia (Pavicic- Bosnjak *et al.* 2012), the UK (Grecory *et al.* 2008), Taiwan (Tsai *et al.* 2015), Brazil (Zubaran and Foresti, 2013), Finland (Koskinen *et al.* 2014), Italy (Petrozzi and Gagliardi, 2016) and Bangladesh (Yu *et al.* 2014)

6.3.2 Methodological Studies

6.3.2.1 Studies that assessed maternal BFSE postpartum

Wutke and Dennis (2007) measured the predictive validity of maternal breastfeeding self-efficacy while the mother was still in hospital (using the BSES-SF) on BF duration and exclusivity at eight and sixteen weeks in a convenience sample of 105 Polish mothers. It follows a descriptive comparative study design reporting that mothers who breastfed at eight (M=56.7, SD=8.1) and sixteen (M=57.9, SD=7.3) weeks reported higher levels of in-hospital BFSE in comparison with those who were formula feeding (M=50.7, SD=7.9 at 8 weeks; M=50.6, SD=8.5 at 16 weeks, p-value=0.001). The BSES scores were even higher among mothers who exclusively breastfeed with mean BSES-SF scores of 58.1 (SD=7.5) and 58.0 (SD=7) at 8 and 16 weeks respectively, vs mothers who were partially breastfeeding with 52.9 (SD=8.6) and 55.7 (SD=9.4) or mothers who were formula feeding with 50.7 (SD=7.9) and 50.6 (SD=8.6) at eight and sixteen weeks, respectively.

Similar were the findings from a study conducted by Pavicic-Bosnjak *et al.* (2012) in Croatia with the participation of 190 mothers recruited during their stay at the hospital. In-hospital maternal BFSE levels were significantly higher for mothers that BF at the first month after the birth (M=56, SD=7) as well as the sixth month (M=57, SD=7) than those who did not (M=49, SD=8 at first month; M=53, SD=7 at sixth month). When BF status was further categorized into EBF, partial BF and non-BF, mothers who reported EBF at the first (M=57, SD=7) and the sixth (M=58, SD=7) month had the highest levels of breastfeeding self-efficacy (as measured at the hospital) than those who were either partially (M=52, SD=6 at first month; M=56, SD=7 at sixth month) or not breastfeeding at all (M=52, SD=6 at first month; M=56, SD=7 at sixth month). When a multivariable logistic regression analysis was employed to estimate the strength of the association between BFSE and BF outcomes while accounting for socio-demographic characteristics (age, education attainment, parity, family income) maternal BFSE was identified as a

predictor of EBF at the first month (OR: 1.10; 95% CI: 1.05-1.16; p-value<0.001), but the association with EBF at the sixth month was slightly short of conventional statistical significance (OR: 1.05; 95% CI: 0.99-1.12; p-value=0.08).

Also consistent with the findings of the previous studies, were the findings by McQueen *et al.* (2013). Their study assessed the predictive validity of in-hospital BSES- SF in a group of 130 native mothers in the U.S.A. Mothers who breastfed exclusively during the last 24-hours had higher levels of BSES-SF than those who performed mixed breastfeeding or bottle feeding at both four (p-value = 0.001) and eight weeks postpartum (p-value= 0.0002). No significant differences were found on BSES scores among mothers that EBF and BF at four and eight weeks (**Table 6.2 (b)- Appendix B**).

Another methodological study (Ip *et al.* 2012) conducted to assess the validity and the reliability of the translated form of BSES-SF among Hong Kong Chinese mothers during their stay in hospital (48-72 hrs), investigated among other metric properties of the scale, the diagnostic ability of the tool for identifying mothers that are more likely to discontinue breastfeeding within the first six months. The authors conducted a ROC analysis and found that the BSES-SF at a cut-off value= 45.5 could be used as a screening tool to identify mothers that most likely to discontinue breastfeeding before six months with Sp= 73%, Sn= 73%, PPV= 92% and NPV=42%. The predictive validity of BSES-SF was also assessed by comparing BSES-SF scores between EBF, partial BF and bottle feeding at the first month (mean 46.6 (SD 9.5) vs mean 39.4 (SD 10.0) vs mean 38.6 (SD 10.6) respectively; p-value<0.001) and the sixth month (mean 50.5 (SD 8.8) Vs mean 45.9 (SD 10.2) vs mean 39.2 (SD 10.1) respectively; p-value<0.001). It should be noted that scores on the BSES-SF presented a stepwise decreasing pattern across EBF, partial BF and bottle feeding at both time-points. Furthermore, mothers who continued to exclusively or at least partially breastfeed up to the sixth month reporting higher BSES-SF scores from the first month.

Petrozzi and Cagliardi (2016) also reported that higher BSES scores at birth in Italian mothers who full breastfeed at 3 months in comparison with those who would either partially breastfeed or bottle feed. In their study, they also used ROC analysis and reported that the scale had good validity for predicting mothers who would be fully breastfeeding (includes, water and vitamins) at three months (ROC= 69%). Specifically, they reported that for every unit increase in BSES, there was an increase of 2.4% in the probability of full breastfeeding at three months (p-value=0.007). The only other factors that was

predictive of full breastfeeding at 3 months was educational attainment of the mother; no association was observed with mode of birth, or parity, or nationality of the mother. The study also showed a negative correlation between breastfeeding self-efficacy and degree of postpartum depressive symptomatology (as measured by the Edinburgh Postpartum Depression Scale).

Gregory *et al* (2008) investigated the psychometric characteristics of the maternal Breastfeeding Self-Efficacy Scale (Short-Form) in an ethnically diverse sample of 165 women in the UK. The authors observed that in-hospital maternal BFSE levels were associated with infant practices before discharge as well as BF status at four weeks postpartum. Women who were EBF ($M= 49.4$, $SD=12.9$) at 4 weeks had higher levels of in-hospital maternal BFSE than mothers who were either partially breastfeeding ($M= 44.7$; $SD=9.7$) or formula feeding ($M= 42.4$, $SD=11.7$); $P<0.001$. In relation with ethnicity, BSES scores in mothers of Caucasian origin ($M= 44.4$, $SD=12.1$) were found to be lower than those of other ethnicity ($M= 48.4$, $SD=12.9$; $p\text{-value}= 0.004$).

In general, most methodological studies conducted in diverse cultural groups with the aim to examine the predictive validity of the original version or the short-form of BSES report similar findings. For example, Oliver-Roig *et al.* (2012) reported that in-hospital BSES levels were higher among Spanish mothers who exclusively breastfeed at 3 weeks compared to mothers who did not exclusive breastfeed. Similarly, a study in Turkey by Eksioglu & Ceber (2011) also found that EBF mothers have significantly higher BSES scores than non-exclusively BF mothers. Similar are the findings in studies that focus on specific sub-groups of the population. For instance, McCarter-Spaulding & Dennis (2010) assessed the predictive validity of the BSES-SF amongst black women of African descent in USA and reported similar findings.

6.3.2.2 Studies that assessed maternal BFSE prenatally

The vast majority of studies assessed the maternal breastfeeding self-efficacy either in-hospital perinatally or postnatally. This is mainly attributed to the fact that the BSES scale is tapping on aspects of breastfeeding self-efficacy once the behaviour has started. A study by Peneiro-Albero (2013) investigated the psychometric properties of a tool which was specifically developed to assess the levels of BFSE prenatally. It was used in a convenience sample of 234 Spanish mothers at their third trimester of gestation. Based on their results, the authors reported that mothers who initiated exclusive breastfeeding had

significantly higher levels of prenatal BFSE (M=73.78, SD= 12.48) than mothers who did not breastfeed exclusively (M=65.84, SD. 15.95; p-value= 0.001).

6.3.3.3 Studies that assessed maternal BFSE both prenatally and postpartum

One of the few studies (Dennis *et al.* 2011) that assessed the predictive validity of BSES-SF both prenatally and postnatally was a study among a sample of adolescent mothers who intended to breastfeed. The study showed that mothers who initiated BF had higher prenatal BSES scores (M: 53.29, SD: 6.83) than those they did not (M: 48.74, SD: 8.54; p-value=0.005). The study also identify differences in BSES scores between BF and non-BF mothers at fourth-week postpartum. At 4 weeks, mothers who were exclusively breastfeeding had higher antenatal and postnatal BSES scores (M=55.9, SD= 6.66 antenatal; M=62.17, SD= 7.92 postnatal) than all the rest. The BSES scores showed a stepwise-fashion decrease with breastfeeding behaviour irrespective of whether measured antenatally or postnatally. Specifically, antenatally the scores were M=51.71, SD= 7.08; M=52.36, SD= 0.98 and M=49.26, SD= 7.66 among mothers who were high breastfeeding (defined for the purposes of this study as breast milk as well as other liquids but not formula e.g. vitamins), partially breastfeeding (defined by at least one bottle of formula feeding per day) or bottle feeding (only formula) respectively. Similarly, the postnatal scores were M=62.42, SD= 7.41; M=57.72, SD= 11.48 and M=49.08, SD= 9.99 across the three comparison groups.

Consistent with the previous study, the study by Tokat *et al* (2010) in Turkey investigated the association of BSES-SF on BF duration with the recruitment of two parallel samples of expectant (antenatally) and new (postnatally) mothers. Mothers who were BF and EBF, had higher antenatal and postnatal BSES scores at 12 weeks postpartum. For the group of mothers recruited antenatally, those who exclusively breastfed at 12 weeks had on average higher BFSE scores with a mean 59.8 (SD: 6.3), compared to those who were almost EBF (defined in this study as “*breast milk as well as other other liquids but not artificial feeding*”) with a mean score of 56.0 (SD: 5.7), those who reported high BF (defined in this study as “*less than one bottle of artificial milk per day*”) with a mean score of 55.6 (SD=5.7) and those who were formula feeding with a mean score of 54.7 (SD: 6.7); p-value=0.004, again showing a stepwise increase in terms of the exclusivity of breastfeeding. Among the postnatal group, EBF mothers had the highest BFSE scores (M=61.7, SD= 5.8) compared to those who BF almost exclusively (M=54.4, SD= 4.6),

who high BF (M=54.0, SD= 4.6) or were bottle-feeding (M=53.4, SD=7.4). The observed differences also displayed a stepwise pattern and were statistically significant (p-value<0.001).

Tables 6.2 (a) and **Tables 6.3 (a)** present the main characteristics of study design of the methodological and observational studies that investigated the association between BFSE and BF outcomes and **Tables 6.2 (b)** and **Tables 6.3 (b)** show the main findings of the studies (**Appendix B**).

6.3.4 Observational Studies

6.3.4.1 Studies that assessed maternal BFSE postpartum

A prospective study conducted by Semenik (2008) recruited 189 primiparas who intended to BF exclusively for at least six weeks. The study investigated the association of maternal BFSE with duration of exclusive breastfeeding up to the sixth month of the infant's life. Breastfeeding self-efficacy was measured with the BSES at three time-points- within the first 24-72 hours, at six weeks and at four months postpartum. While mean BSES score increased between the first assessment and the first six weeks by 7.5 units among EBF mothers, a reduction in BSES mean scores was observed in the FF group (defined as only formula feeding) and the weaning group by 4.6 and 11.2 units respectively. In a multivariable Cox regression analysis to examine the association of breastfeeding self-efficacy and the duration of exclusive breastfeeding up to six months, the authors found that breastfeeding self-efficacy was one of four variables (HR: 0.98; 95% CI: 0.96-0.99; p-value=0.04) to predict longer duration of breastfeeding, along with mode of birth, supplementation with formula at the hospital and prenatal class attendance.

A study with a descriptive longitudinal design in Taiwan (Tsai *et al.* 2015) recruited a purposive sample of 120 primiparous mothers who gave birth during 2010-2011 in one of two BFHI-accredited hospitals. One hospital was located in the metropolitan city of Taipei (response rate: 70.4%) and the other in a suburban area (response rate: 78.9%). The study assessed in-hospital maternal breastfeeding self-efficacy (also using the BSES) during the last 24-hours before discharge and then again at the 1st and 3rd month after discharge. Mothers with higher breastfeeding self-efficacy were more likely to initiate (OR: 1.09; 95% CI: 1.06, 1.13) and continue EBF at the first (OR: 1.04; 95% CI: 1.02, 1.07) and the third month (OR: 1.03; 95% CI: 1.01, 1.06). Using a Cox regression analysis, maternal breastfeeding self-efficacy was also identified as one of the strongest predictors of BF discontinuation before six months with HR: 0.98 (95% CI: 0.96, 0.99), along with intention for shorter BF duration and late BF initiation.

McQueen *et al.* (2015) conducted a prospective mother-child cohort study in order to investigate the determinants of breastfeeding among a sample of 132 Aboriginal women (response Rate: 86%) in Canada in the early postpartum period. Maternal breastfeeding self-efficacy was one of the variables included in the study. This was assessed using the

BSES-SF and measured at three time points – before hospital discharge, at four and eight weeks postpartum. In-hospital BFSE scores were found to be significant predictors of both BF duration as well as exclusivity at any point during the first eight weeks. Using a logistic regression model to quantify the strength of the association between in-hospital BSES scores and BF, for the authors reported that each 10-point increment in maternal BFSE score was associated with a 1.8-times increase in the odds of BF (OR: 1.78; p-value=0.004) and 2.2-times increase in the odds of exclusivity (OR: 2.2; p-value=0.001). In a descriptive correlational study, Loke & Chan (2013) found similar results when assessed the association of in-hospital BFSE with BF at 6 weeks (EBF: 43.5 vs Complementary BF: 36.3 vs FF: 34.6; p-value<0.001).

Ku and Chow (2010) in a study of cross-sectional and prospective design with longer follow-up reported that mothers with higher in-hospital BFSE scores were more likely to EBF at six months (OR: 1.104; 95%CI: 1.061, 1.149; p-value<0.001). A more recent study by Linares *et al.* (2015) among Hispanic mothers in the US also confirmed the predictive value of breastfeeding self-efficacy as a screening tool to identify mothers at-risk of discontinuing breastfeeding prematurely. Using a logistic regression model, they estimated that for every point increase in the BSES score, there was an increase in the likelihood that a mother would EBF at fourth month by 20%. The authors that this might be of clinical importance since for a 5-point difference in the BSES score, the odds that a mother will EBF at four months is increased by 2.47-times. (95% CI: 1.42-4.30).

Another prospective cohort study in Australia (Baghurst *et al.* 2007) looked at the association of maternal breastfeeding self-efficacy with breastfeeding, this time looking at the timing that weaning was initiated within the first six months among primiparous mothers. In this study, BFSE was measured within the first week postpartum. In fact, the study calculated the participants' scores based on both the original as well as the short-form of BSES, since an aim of the study was to assess the predictive validity of the short-form of the scale. A multivariable regression analysis, adjusting for maternal education, country of birth, housing situation (house rental, house owner, living with others) smoking status, Indented BF duration, identified an inverse association between BSES and weaning with an adjHR of 0.9682 (95% CI 0.9585, 0.9781). Similar findings were observed when the short-form of the tool was used, further supporting that the predictive validity of the short-form (14 items) of the scale is comparable to the full-scale (33 items). In one of the few studies to assess the change in breastfeeding self-efficacy within the first postpartum period,

O' Brien *et al.* (2008) reported that among 375 women in Australia, an increase by 1% of in-hospital maternal self-efficacy within the first 14 days postpartum (also measured with the use of BSES-SF tool) was associated with a 5% and 2% increase in the probability of any BF and full BF, respectively at the sixth month. Another study in the US (Wilhelm *et al.* 2008) also measured BSES at two time points - before discharge and at 2 weeks postpartum, using the BSES scale (original version). However, they did not look at the change in the scores in this period, but conducted a logistic regression analysis to compare the predictive ability of breastfeeding self-efficacy, if measured before discharge or at 2 weeks. The authors observed a modest association between breastfeeding at six months only with maternal BFSE measured at 2 weeks postpartum (OR: 1.04; p-value=0.043). No association was observed between breastfeeding and in-hospital BFSE (OR: 0.99; p-value=0.768). While, the lack of association might be due to the particularly small sample size in this study (N=53), it might also suggest that measuring breastfeeding self-efficacy while the mother is still at the hospital might not capture the “true” range of variability in maternal breastfeeding self-efficacy since this will be positively or negatively influenced during the first weeks postpartum by accomplishments, vicarious experiences, and thought patterns or emotional reactions especially in the face of difficulties and obstacles. As the authors stated, provision of support and information on practical BF difficulties during the first days might prevent decrease in BFSE levels and increase BF duration (Wilhelm *et al.* 2008).

6.3.4.2 Studies that examined maternal BFSE prenatally

Only one study (Yu *et al.* 2014) of a prospective design examined the association between maternal BFSE assessed prenatally. This was a study of mothers residing in rural areas in Bangladesh, and maternal breastfeeding self-efficacy was measured at seven months of gestation with the BAPT tool. As also explained above, the BAPT tool mainly taps on attitudes towards breastfeeding (16 items) and subjective norms, specifically perceived opinions of family members and health professionals about infant feeding (5 items). The authors have identified 6 items that relate to breastfeeding self-efficacy to form a separate scale. No association was found between prenatal breastfeeding self-efficacy and exclusive breastfeeding (adjOR: 0.99; 95% CI: 0.82, 1.20) or full breastfeeding in this study (adjusted OR: 1.01; 95% CI: 0.84, 1.23) at 3 months. In fact, no association was found with either knowledge or attitudes towards breastfeeding. The only factor that predicted breastfeeding outcomes in this study was intention to breastfeed. The authors attributed the weak

predictive power of breastfeeding self-efficacy of breast-feeding behaviours to the relatively high levels and low variability in self-efficacy among women in their sample. However, intention BF is considered a significant determinant of self-efficacy. Therefore, BFSE may act as a mediator between the relationship of intention to BF and BF outcomes.

6.3.4.3 Studies that assessed both maternal BFSE both prenatally and postpartum

The only study identified that assessed the association of BSES-SF both prenatally and postnatally was a prospective study among adolescent mothers in Canada who intended to breastfeed (Mossman *et al.* 2008). The study showed that a higher proportion of mothers with higher BSES scores are more likely to initiate and continue breastfeeding during the first 28 days postpartum (HR: 2.22 95% CI: 1.13-4.17; p-value=0.02). The association of postnatal BSES scores with breastfeeding duration was even stronger (HR: 4.19 95% CI: 2.18-8.04; p-value=0.001). In a Cox multivariable regression model performed to identify the potential predictors of BF discontinuation before the first 28 days, low postnatal (but not prenatal) BFSE was found to be associated with a 3.5-fold risk of BF discontinuation. Other predictors of BF discontinuation were smoking and intention to BF for less than 3 months.

6.3.5 Studies that assessed the bi-directional association of BF and BFSE

Evidence on the bi-directional association of BF and BFSE is limited. Only two studies were identified in the systematic review to investigate whether BF practices influence BFSE. A study of descriptive correlational design (Hinich, 2016) with the participation of a convenience sample of 107 women in US during the first four days after birth investigated the determinants of BFSE. In-hospital formula supplementation was found to be one of the most important predictors of in-hospital BFSE ($\beta=-6.01$, $t=-2.60$, p-value=0.011). BSES was also associated with birth satisfaction ($\beta= 0.60$, $t=2.56$, p-value=0.012) and infant feeding intention ($\beta=3.31$, $t=2.10$, p-value=0.038), but not with parity, likelihood of EBF for six months, partner support and feeling of preparedness for childbirth and previous BF experience.

Koskinen *et al.* (2014) in a study of cross-sectional design with the participation of 573 mothers, examined the effect of supplementation during hospital stay and the timing of BF initiation on BFSE. Exclusively breastfed mothers at hospital had higher levels of one week BSES after birth than those whose infants received supplementation, irrespective of the

reason [Median:59 vs 54 vs 54 (with and without Medical reason, respectively); p-value<0.001]. Early BF initiation within one hour was associated with higher BFSE, whereas between two and three hours it was the lowest. However, the association found was not linear.

6.4 Summary

It is well documented in the literature across several populations that maternal breastfeeding self-efficacy (BFSE) is a predictor of BF initiation, continuation and exclusivity. The positive association of BFSE and BF is evident in the literature irrespective of the different time points of measurement of BFSE (either prenatally or postnatally), the use of different BF definitions and indicators (WHO, 1991; 2008/ Labbok and Krasovec, 1990), the use of different methodologies to measure BF (24-hour recall/self-reported) or the use of different BFSE tools.

The vast majority of the observational and methodological studies emanated in this systematic review assessed the association of BF and BFSE with the use of one tool, the Breastfeeding Self-efficacy scale (BSES-scale) developed by Dennis & Faux (1999). The psychometric characteristics of both scales of BSES, the original and the short-form, were evaluated at different time points and at different populations. The predictive validity of the scale, either in its the original or its short form, with regards to BF continuation and exclusivity, suggests that the tool can be used in clinical and community practice as a screening tool in order to identify mothers who are risk for premature BF discontinuation. Even though the BFSE scale is available in Greek (personal contact with the developer), no study assessing the breastfeeding self-efficacy of Greek or Greek-Cypriot mothers has been identified in the published literature.

The literature is limited with regard to the potential bi-directional association between BF and BFSE (i.e. BF establishment positively influences BFSE in the long-run). However, there is evidence to suggest that successful early initiation of BF within the first hour after birth, when acknowledged as a positive personal experience, might be associated with higher BFSE levels at first week postpartum. Furthermore, in-hospital formula supplementation has been associated with lower BFSE levels by comparison to EBF. Further research is required to disentangle the bi-directional association of BFSE and BF since personal experience of BF, and the extent to which this is negative or positive, is likely to be the most important source of self-efficacy.

Part II:

Specific Section

Chapter 7:

Aims and objectives

The purpose of this study was (a) to provide estimates of the prevalence of breastfeeding and exclusive breastfeeding in Cyprus beyond 48 hours and up to the sixth month of an infant's life and (b) describe the socio-demographic and other determinants of exclusivity and duration of breastfeeding, including maternal breastfeeding self-efficacy and the self-reported degree of implementation of the “10 steps for successful breastfeeding”.

The study was part of a wider program entitled “ *The BrEaST start in life: addressing social inequalities and supporting breastfeeding through inclusion activities*”, which aimed to strengthen the evidence-base as well as to raise awareness among health professionals and the general public alike about the expected low breastfeeding rates in Cyprus as well as the hypothesized, based on anecdotal evidence, sub-optimal implementation of the Baby-Friendly Hospital Initiative's “good practices” as described by the “10 steps for successful breastfeeding”, which form the basis of the National Strategy and Policy of the National Breastfeeding Committee. The next sections describe the aims and objectives of this study.

At the end of this chapter, there is a description of the overarching goals, structure and activities of the wider “*BrEaST start in life*” project, which was funded by Island, Liechtenstein, and Norway through the EEA Financial Mechanism and the Republic of Cyprus under the Fund for NGO action call (Total: budget: 113,000 euro, Call EEA/CY/NGO/C-1, 2009-2014).

7.1 Aims of the study

- To describe infant feeding practices in Cyprus and provide estimates of the **prevalence of breastfeeding and exclusive breastfeeding** while at the clinic as well as up to the sixth month of an infant's life

- To investigate some of the determinants of breastfeeding, and specifically the extent to which the prevalence of breastfeeding and exclusive breastfeeding at different time-points during the first six months differs according to **socio-demographic characteristics** of the mother (e.g. parity, educational attainment, income) as well as other **health system and clinical variables** (e.g. public vs private sector, mode of birth, etc)
- To assess **maternal breastfeeding self-efficacy** and investigate its association with breastfeeding initiation (at 48 hours), exclusivity and likelihood of breastfeeding up to the sixth month.
- To assess the degree of **implementation of the “10 Steps for Successful Breastfeeding”** across maternity clinics in Cyprus based on the self-reported experience of the mothers and investigate the association of these practices with maternal breastfeeding self-efficacy and breastfeeding outcomes.
- To assess the perceived **Infant Care Social Support** as well as the perceived **workplace breastfeeding** support among women in Cyprus and the degree of social gradient

7.2 Objectives

The specific objectives of the study are described below in more detail, classified according to the main study outcome under investigation

7.2.1 Prevalence and Determinants of Breastfeeding and Exclusive Breastfeeding

- To estimate the prevalence of breastfeeding and exclusive breastfeeding at 48 hours (initiation) among women giving birth in public and private clinics in Cyprus
- To estimate the prevalence of breastfeeding and exclusive breastfeeding at the 1st, 4th and 6th month of the infant's life (continuation)

- To compare the observed breastfeeding indicators between maternity care facilities in the public and private sector and across Districts of the island.
- To investigate socio-demographic and other determinants of breastfeeding and exclusive breastfeeding, including parity, educational attainment, family income, mode of birth etc
- To investigate the association between self-reported experience of the “10 steps for successful breastfeeding” and breastfeeding initiation, exclusivity and continuation up to the sixth month.
- To investigate the association between perceived maternal breastfeeding self-efficacy with initiation, exclusivity and continuation of breastfeeding

7.2.2 Maternal Breastfeeding Self-Efficacy

- To assess perceived breastfeeding self-efficacy among mothers who give birth in Cyprus while at the clinic (at 48 hours) and at the 1st month after birth
- To assess the extent to which maternal breastfeeding self-efficacy differs according to socio-demographic characteristics (e.g. parity, educational attainment, income) and clinical variables (e.g. mode of birth, etc)
- To investigate the association between maternal breastfeeding self-efficacy while at the clinic and the self-reported experience of the “10 Steps for Successful Breastfeeding”
- To investigate the association between maternal breastfeeding self-efficacy at 48 hours with breastfeeding (BF) and exclusive breastfeeding (EBF) at 48 hours and the likelihood to continue BF/EBF at the 1st, 4th and 6th month, before and after adjusting for other determinants of breastfeeding
- To investigate the association between maternal breastfeeding self-efficacy at the 1st month after birth with breastfeeding (BF) and exclusive breastfeeding (EBF) at the first month and the likelihood to continue BF/EBF at the 4th and 6th month, before and after adjusting for other determinants of breastfeeding

7.2.3 The 10 Steps for Successful Breastfeeding

- To assess the degree of implementation of the 10 Steps based on the self-reported experience of women giving birth in maternity clinics in Cyprus
- To compare self-reported experience of the 10 Steps across women giving birth in maternity care facilities in the public and private sector
- To investigate the association of the self-reported experience of the 10 steps with breastfeeding and exclusive breastfeeding while at the clinic, before and after adjusting for each other, in order to identify the most predictive set of “good practices”
- To investigate the association of the self-reported experience of the 10 steps with the likelihood of breastfeeding and exclusive breastfeeding at the 1st, 4th and 6th month after birth, before and after adjusting for each other, in order to identify the most predictive set of “good practices”
- To investigate the association of the self-reported experience of the 10 Steps with maternal breastfeeding self-efficacy at 48 hours and at the first month after birth, before and after adjusting for each other, in order to identify the most predictive set of “good practices”

7.2.4 Infant Care Social Support and Workplace Breastfeeding Social Support

- To assess the level of perceived Infant Care Social Support among women in Cyprus who have been caring for an infant for the past 4 months
- To describe the functional component (informational, instrumental, emotional and appraisal support) and the structural component (sources of formal and informal) of social support among women caring for infants in Cyprus
- To assess the level of perceived Workplace Breastfeeding Social Support once women go back to work
- To investigate the degree of social gradient in Infant Care Social Support and Workplace Breastfeeding Social Support based on the observed differences according to the educational attainment and family income (as proxy indicators of social position).

7.3 BrEaST start in life project

The research programme «**A BrEaST start in life: addressing social inequalities and supporting breastfeeding through inclusion activities**» was a collaborative project between the NGO Cyprus Breastfeeding Association – “Gift for Life” (<http://www.breastfeeding-cyprus.org/>) and the Department of Nursing, School of Health Sciences, Cyprus University of Technology. It was an 18-month long project (April 2014-October 2015) funded with a total budget of €113.000 by Island, Lichtenstein and Norway through the European Economic Area - EEA Grants and the Republic of Cyprus (Call EEA/CY/NGO/C-1, 2009-2014).

Figure7.1: *The logo of the programme*

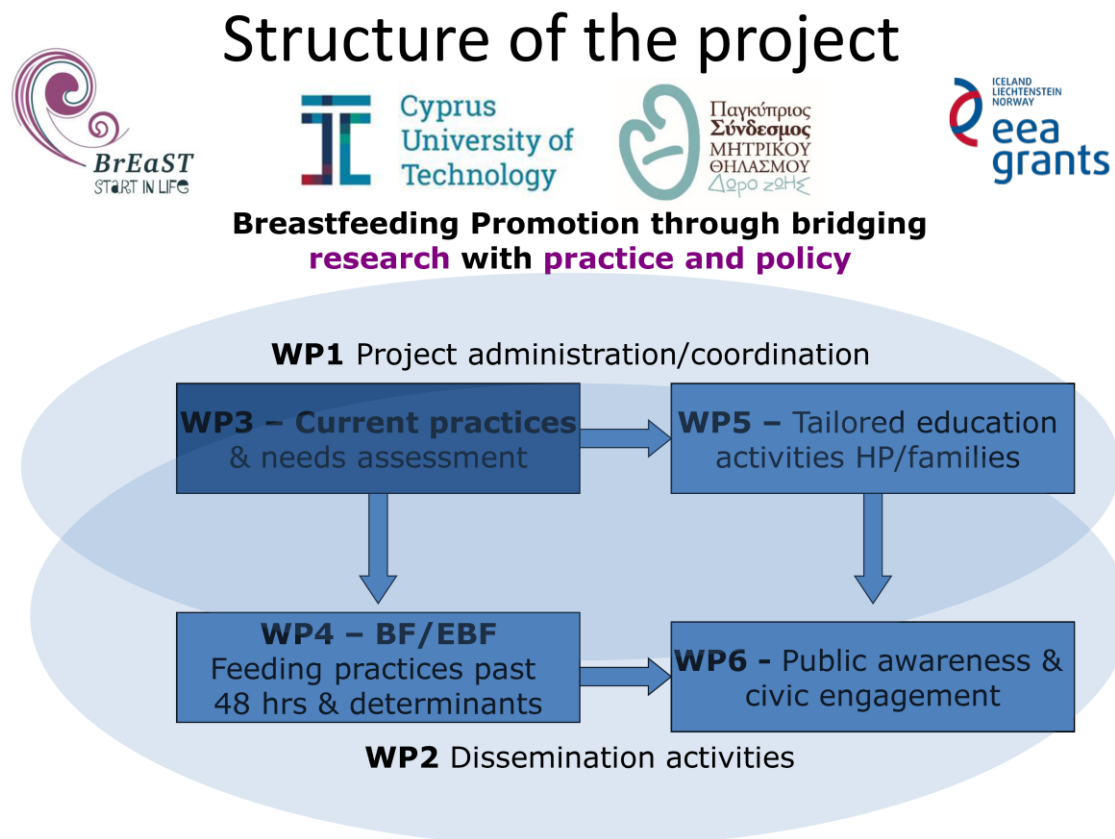


The overarching goal of this project was the promotion of breastfeeding in Cyprus through bridging research (improve the evidence-base) with practice and policy. Specifically, the project set out to (a) to assess the current situation regarding the implementation of the BFHI’s “10 steps” across Cypriot maternity units (WP3) in order to identify the key problematic

areas and enable targeted and customized training and educational activities towards health professionals and expectant parents (WP5) and (b) to fill the knowledge gap in terms of breastfeeding indicators in Cyprus and identify key determinants of breastfeeding behaviour amongst Cypriot mothers, including breastfeeding self-efficacy (WP4) in order to inform, customize and better target the outreach and public awareness activities (WP6).

Figure 7.2 presents in graphical form the structure of the programme’s activities in six distinct but inter-related work packages. WP3 and WP5 are the research-related activities, addressed by this thesis, while WP4 referred to a series of continuous professional education activities for health professionals and workshops for expectant/new parent and WP6 referred to series of public awareness and civic engagement activities. WP2 referred to the dissemination activities which is a horizontal work-package that runs throughout the period of project.

Figure 7.2: Structure of the BrEaST start in life project



A number of dissemination and outreach activities were organized during the course of the programme. In brief:

- a variety of information material was produced, including a Greek/English/Turkish leaflet promoting awareness of the “10 steps for successful breastfeeding”, a related 30sec and a 3min documentary films and a 2015 calendar normalizing breastfeeding in social settings. These were disseminated in Maternity and Pediatric Clinics as well as in Parents’ meetings routinely organized by the Cyprus Breastfeeding Association, print and social media.
- A leaflet (**Appendix D**) and related translations of it in English and Turkish was prepared, which presents the main findings in terms of on the implementation of the 10 steps across Cypriot maternity clinics using infographics specifically designed for the purposes of this project.
- A second leaflet was designed to present the main findings in terms of the observed trajectory in the prevalence of breastfeeding and exclusive breastfeeding during the

first six months of life (**Appendix D**). Both were widely disseminated at all Health Professionals' and Stakeholders' events as well as via the media.

- Articles with the survey findings appeared in Newspapers, Magazines and health-related Media websites and members of the team appeared on Radio/TV to talk about the project.
- During the course of the project, two consecutive Global Synchronized Breastfeeding events were organized (on 4 Oct 2014, where 328 mothers and 333 babies participated and on the 10 Oct 2015, where 405 mothers breastfed 411 babies). Both were widely covered by the media, attended by stakeholders and were used for the dissemination of the leaflets and other information material.
- A press conference was organized for the dissemination of the final results of the project, followed up by a stakeholders' meeting with participants from the National Breastfeeding Committee, all relevant Professional Associations, the Ministry of Health, Ministry of Education and Ministry of Labour, as well as breastfeeding mothers. The results as well as necessary raising awareness actions were discussed, and based on the discussions the partners proceeded in issuing "key recommendations" for action organized in the four priority areas as identified by the National Strategy for Breastfeeding as well as an additional one which refers to inter-agency action beyond the health care system (**Appendix E**)
- The findings of the project were also disseminated widely to the academic and health professional community at the local level (Annual Nurses' and Midwives' Association Conference, Pediatric Conference and National BF Committee seminar) as well as at the international and European level. A list of presentations in International and European conferences appears in **Appendix A**.

Chapter 8:

Methodology

This chapter describes the study methods (e.g. study design, sampling, eligibility criteria, recruitment process etc) as well as the material used for measuring the study variables (e.g. questionnaires and scales). A summary of the protocol of the study, as submitted for the necessary approvals from the Cyprus National Bioethics Committee, the Research Promotion Committee of the Cyprus Ministry of Health and the Commissioner for the Protection of Personal Data appears (in Greek) in **Appendix C**.

8.1 Study Design

This is a nationwide cross-sectional and longitudinal descriptive study, conducted in two phases between April 2014 and June 2015. *At phase 1*, a descriptive comparative cross-sectional study was conducted during mothers' stay at the maternity clinics after birth. During phase II, all mothers who provided contact details (phone and/or email) were followed-up prospectively with a telephone interview at the first, fourth and six month postpartum. **Figure 8.1** presents the stages of study and the questionnaires completed at each stage.

Figure 8.1: *Stages of Study conduct and Questionnaires completed at each stage.*

STAGE	24-48 hours	1 st Month	4 th Month	6 th Month
	10 Steps to Successful Breastfeeding (UNICEF/ WHO)	IFPs Questionnaire	IFPs Questionnaire	IFPs Questionnaire
QUESTIONNAIRE	Breastfeeding Self-Efficacy Scale (BSES-SF)	Breastfeeding Self-Efficacy Scale (BSES-SF)	Perceived Infant Care Social Support Scale (PICSS- Scale)	Workplace Breastfeeding Social Support Scale (WBSS)
MODE	Self- administered	Telephone interview	Telephone interview	Telephone interview

8.2 Maternity Clinics

In order to obtain a representative sample of mother-infant pairs at birth, it was decided that all maternity clinics would be invited to participate in the study. Thus, all maternity clinics in Cyprus were formally invited in writing to participate, followed by personal meetings with the hospital administration. This includes all maternity wards in all District hospitals as well as all maternity clinics operating at the time of the study in the private sector in all districts of the island. Based on a list obtained by the Ministry of Health, a total of 35 private maternity clinics were operating in Cyprus during that period. Unlike the public sector for which statistics on the number of births are officially recorded and released, there were no data for the private sector at clinic level about the volume of births in these clinics. The ratio of births in Cyprus is 30:70 in the public: private sector respectively. With a cohort of 10000 births annually, this corresponds to about 3.8 births per week on average across the 35 private clinics (about 7000 births distributed across 35 clinics across 52 weeks in a year). Based on this approximation, clinics with more than 4 births a week were considered to be “large” clinics.

Two representatives of the “BrEaST start in life” research team attended the meeting. At these visits, the team also obtained information from the clinic administration on the

annual or monthly average volume of births, depending on what each clinic could provide. It should be noted that, due to lack of electronic files, the response from the clinics was most commonly an approximate estimate based on the number of births registered in paper-form during the past few months prior to the study.

At these meetings, informational material was given to the managers explaining the aims, the importance the study as well as a brief description of the study design and recruitment procedures. This included the study's summary protocol, sample questionnaires in Greek and English and the respective informed-consent letter which would be given to the participants. The research team explained that participation of the clinic is voluntary and anonymous, that no statistics (breastfeeding, C/S, implementation of 10 steps etc) would be published at clinic-level, and that aggregate indicators would only be presented as public and private sector.

Once receiving verbal acceptance for the clinics' participation, we also requested to have a signed letter of confirmation (**Appendix F**) for use by the field-workers. This was included in the informational pack so that they could use it during their visits to the clinic, if and when asked by either the staff of the clinic or the potential participants. This process ensured that the recruitment process would not be hindered if any issues, problems and/or misunderstandings arose during field work.

Maternity wards in all public hospitals (5 in total) and 24 of the 30 private clinics agreed to participate. Of the six that did not participate, four are small maternity clinics in terms of the volume of births. Amongst the larger clinics (i.e. estimated as having more than 40 births during the recruitment period, that is to say 4-5 births per week), only two did not participate. In both cases, inconvenience and/or disruption of routine activities were cited as the reasons for opting out. One of the maternity clinics is located in the district of Nicosia and the second one in Paphos.

Table 8.1: *Maternity Clinics in the public and private sector by district*

		Total # of Maternity Clinics by District	# of Participating Maternity Clinics
Nicosia	<i>Public</i>	1	1
	<i>Private</i>	8	7
Limassol	<i>Public</i>	1	1
	<i>Private</i>	11	8
Larnaca	<i>Public</i>	1	1
	<i>Private</i>	5	5
Paphos	<i>Public</i>	1	1
	<i>Private</i>	4	3
Ammochostos	<i>Public</i>	1	1
	<i>Private</i>	2	1
Total		35	29 (82.9%)

8.3 Sampling and sample

A convenience consecutive sample of mother-infant dyads was recruited during their staying at their maternity clinics after birth, based on a pre-defined set of eligibility criteria. During phase I, a consecutive sample of mother-infant dyads was recruited during their stay at maternity clinics over a period of 6-8 weeks. Keeping the recruitment period constant across sites was important in order to approximate the correct distribution of births across settings, as there is no official clinic-level data on the number of births in the private sector, which nevertheless accounts for over 70% of all births. Adjustments to the length of the stay at each clinic were made if necessary, given the observed differential non-participation rate, in order for the final sample to approximate the known proportion of birth across the two sectors (70-30 split) as well as across the proportion of births across the five districts (as per official statistics of the Ministry of Health). Sampling continued to secure a sizeable sample at baseline to allow for up to 50% potential drop-outs in the follow-up phase of the study (see sample size calculation in the next section).

It was decided a priori that participation in the phase I of the study will not be restricted to those participants who also wished to participate in the follow-up stages. Thus, mothers who wanted to participate in phase I, but did not wish to provide their contact details, were

not excluded from participating in phase I. This was important in order to achieve a representative sample at baseline and different consent forms (**Appendix G**) for the two stages were provided to potential participants in order to allow for this. During phase II, all mothers who provided contact details (either phone and/or email) were followed-up prospectively with a telephone interview at the first, fourth and six month postpartum.

8.3.1 Sample size estimation

Precision analysis with finite population correction (as annual number of births is around 10000) suggested that the minimum required sample size in order to estimate the prevalence of breastfeeding with 95% confidence interval not wider than $\pm 5\%$ was 370 participants. This is similar in terms of estimating the proportion of women reporting experiencing any of the 10 steps. This sample size also provides sufficient statistical power of 80% to detect a difference in the magnitude of 10-15% at the 5% statistical significance level for the comparisons of interest (e.g. private vs public sector, vaginal vs C/S birth). This was considered satisfactory and within the expected range based on previous local estimates (at least for the observed difference in breastfeeding initiation between districts and public/private sector) as well as published literature. This corresponds to having adequate power (80-90%) to detect an association in the magnitude of Odds Ratio=2.0 at the 5% statistical significance level. Indicatively, in the study of Vassilaki *et al* (2012), the OR of breastfeeding initiation was 2.14 amongst women in Crete with the highest educational attainment and 0.51 (i.e. of similar magnitude) among women who gave birth by C/S.

Furthermore, in terms of detecting the association between maternal breastfeeding self-efficacy and breastfeeding outcomes, the sample size is also considered satisfactory based on the range of estimates observed in previous studies. The presentation of estimates in the literature is not directly comparable, both because of the different study designs and analytical approaches employed by the studies as well as due to the different length of the follow-up. A number of studies have reported the association of maternal breastfeeding self-efficacy with the likelihood of breastfeeding and/or exclusively breastfeeding in the long-term (1st, 4th or 6th month). Studies that reported the association in terms of the likelihood of breastfeeding or exclusive breastfeeding per 5-10 units increase in the breastfeeding self-efficacy scores (for example, Ku & Chow, 2010 and McQueen *et al.*,

2015), the estimates were of the magnitude of 2.00 in the odds ratio scale, or even higher in the case of exclusive breastfeeding. Thus, the minimum estimate sample size would provide adequate power (80-90%) to detect an association at the 5% statistical significance level assuming that an association of similar magnitude estimates can be expected in Cyprus. Studies that have presented the association in terms of 1 unit increase in breastfeeding self-efficacy scores, the odds ratio estimates for BF/EBF range from 1.05 to 1.10, which nevertheless corresponds to an odds ratio of 1.6-2.6 expressed as a 10 unit increase in the breastfeeding self-efficacy scale.

A number of studies, of descriptive comparative design (for example, Greco *et al*, 2008; Loke and Chan, 2013) have provided a comparison of breastfeeding self-efficacy scores as measured while the mother was still at the clinic between mothers who were still breastfeeding exclusively, partially or formula feeding at the follow-up. In such studies, the observed difference in the in-hospital scores of breastfeeding self-efficacy was in the range of 5-10 units; hence considered of clinical importance in terms of the predictive value of the score. In these studies, this corresponds to 0.5 SD (medium) to 1 SD (large) effect size according to the observed variance in breastfeeding self-efficacy scores. Assuming that a similar level of variability in the breastfeeding self-efficacy scores will be observed amongst women in Cyprus, a sample size of 370 is more than adequate (power>90%) to detect a difference in breastfeeding self-efficacy scores of this magnitude at the 5% statistical significance level. Indicatively, a sample size of 140-200 participants is needed to provide 90% statistical power to detect a difference of 0.5 SD between women who are breastfeeding and not breastfeeding (depending on the actual size of each comparison group); which is more commonly the size of the sample reported in many of the previously published studies. Power calculations in open software package, GPower (Faul and Erdfelder, 1992) suggest that a sample of 370 provides at least 80% power to detect a statistically significant difference of as little as 0.3 SD in breastfeeding self-efficacy between women who breastfeed and do not breastfeed, with an allocation ratio of 1:3 (i.e. a proportion of 25% of women breastfeeding).

In order to take into consideration the potential loss to follow-up during phase II, the minimum required sample for phase I was set to at least 550 (up to 50% loss to follow-up).

8.3.2 *Post Hoc power analysis*

A post hoc power analysis was performed to estimate the retrospective power of the actual sample size based on the parameter estimates and observed effect sizes, which resulted from the given data set (Lenth, 2007). The final sample size of 586 mothers who participated at the baseline allow the estimation of the prevalence of breastfeeding initiation (actual estimate around 80%) and exclusive breastfeeding (actual estimate around 20%) with a $\pm 3.2\%$ margin of error (95% confidence intervals), and equivalently, with a $\pm 4.0\%$ and $\pm 6.0\%$ margin of error in the private and public maternity clinics respectively (70:30 proportion). A slightly larger margin of error, in the magnitude of $\pm 5.0\%$ and $\pm 2.5\%$, was achieved in the estimation of the 95% confidence intervals for breastfeeding and exclusive breastfeeding respectively due to attrition.

Similarly, a 0.4 (if expressed as mean score, and 5.5 when expressed as total score) to 0.6 (if expressed as mean score, and 8.5 when expressed as total score) difference was recorded in breastfeeding self-efficacy scores between mothers who did and did not breastfeed throughout the follow-up period, with the difference becoming larger as time progressed. Post-hoc power analysis with regards to the breastfeeding self-efficacy suggested that with even with the smallest sample at the 6th month of follow-up, the study had 90% power to detect of as little as 0.35 SD, which corresponds to 4 point difference in the scale, thought to be clinically significant.

8.4 Eligibility Criteria

Mothers who gave birth in any of the participating clinics during the recruitment period were eligible to participate if:

- they gave birth to a live infant (proportion of stillbirths in 2014 according to the Ministry of Health Perinatal Health Indicators, released in 2016 by the Health Monitoring Unit, available online, is 0.5%),
- they had a single or multiple pregnancy (proportion of non-singleton live births 2.5% according to official statistics),
- they were at least 18 years of age (proportion of mothers below 20 years of age 1.5% according to official statistics)

- they could read or speak Greek or English (as it was important not to exclude the high proportion of non-Greek service users). According to official statistics for 2014, for 30% of births, the mother was not from Cyprus, with an equal proportion of mothers with an EU and a non-EU nationality.
- they had no health problems precluding them from breastfeeding, as recorded in the medical file and/or communicated to the team by the maternity clinic staff (e.g. bilateral mastectomy, postpartum maternal complications) and
- they were not separated from their infants after birth for medical reason, which would preclude them from allowing breastfeeding initiation within one hour, e.g. transferred to NICU at the same hospital or at a different location (low birth weight <2500gr ~11%, gestational period < 37 weeks ~13% according to official statistics).

8.5 Recruitment Procedure

Mother-infant dyads were recruited during their stay at the maternity clinics. In consultation with the department staff, trained researchers approached mothers after 24 hours and no later than 48 hours after birth to invite them to participate, after explaining the purpose of the study, and what participation would require. The participants were provided with written information about the study, which included the contact details of the research team in case they had questions about the study at a later stage. Written consent was obtained from mothers for their participation. Separate consent was obtained for participation in each phase, since participation in the second phase required the provision of personal contact details (telephone number and/or email).

Fifteen field workers were involved at the first phase of the study. They were all students of midwifery, nursing or other allied health profession, and thus all had received training in communication skills as part of their academic and clinical training. In addition, prior to their involvement in the study, the field workers received a short training in the form of a workshop. During the course of the field-work, there were frequent meetings in order to receive their feedback about the progress of the recruitment process, discuss issues or problems that arose, and give guidance. When necessary, the field-workers were in telephone contact with the main researcher. The main researcher received the completed questionnaires and consent forms, and filed them accordingly in order to facilitate the process of phone interviews.

Visits at the clinics by the field-workers were held every other day, since commonly the duration of stay at the maternity clinic in Cyprus is rarely less than two days. Eligible mothers who agreed to participate, were asked to complete a questionnaire, while field workers waited outside their room to ensure privacy. The questionnaire was then returned in a sealed envelope. If a potential participant was not available during the visit, or did not wish to be disturbed, the field worker arranged an appointment to return at a specific time that would be convenient in consultation with the mother and the maternity clinic staff. Alternatively, the mothers were also given the option to complete the questionnaire in their own time, in which case the field workers left the pack and arranged a later time to pick it up in a sealed envelope either directly from them or from the maternity facility staff (commonly, the receptionist). During the course of the study, it became apparent that in rare occasions a very small number of mothers did not have the opportunity to be informed about the study because they were discharged earlier (i.e. within 24 hours after birth).

Participants who consented to participate at phase two of the study and provided a phone number or an email address were contacted at one, four and six months after discharge by phone or email respectively by the main researcher. The majority of participants provided a phone number on their consent form. Only 50 participants provided only an email address of whom only 10 replied to our emails and continued their participation at any of the time points of follow up (one at 1st month, one at fourth month, three at sixth month, one at first and fourth month, one at fourth and sixth month, three at first, fourth and sixth month of follow up). Generally, effort was made so that the follow-up interviews were conducted within a week either side of the fourth and sixth month of the infant's life. Nevertheless, due to the large number of phone interviews, in some cases there was a slightly longer delay in interviewing participants.

8.6 Data collection tools

At baseline (During Hospital Stay): In addition to questions about breastfeeding, the baseline questionnaire pack included two tools, which are described in more detail in the next section. The questionnaire took about 15-20 minutes to complete. Specifically,

- The self-reported experience of the “10 steps for successful breastfeeding” was assessed with the use of the Greek version or the English version of the self-administered **WHO/ UNICEF questionnaire - Section 4** (UNICEF/WHO, 2009), with the permission of the Greek National Commission of UNICEF (**Appendix H**). This is part of the WHO/ UNICEF Baby Friendly Initiative questionnaire – see next section for details.
- Perceived maternal breastfeeding self-efficacy was assessed with the use of the **Perceived Breastfeeding Self-efficacy scale – short-form** (BSES-SF), developed by Dennis & Faux (1999), with permission by the developer who provided an existing Greek translation of the scale – see next section for details.
- Finally, participating mothers were asked to provide information on sociodemographic factors, parity, breastfeeding history, intention to breastfeed, lifestyle factors (e.g. smoking, alcohol) drug use before and during pregnancy.

At 1st Month: The first month questionnaire (**Appendix I**) mainly included questions on **infant feeding practices** using the self-reported current status and the 24hr recall method. The phone interview was estimated to last 15-20 minutes. Specifically,

- Mothers responded to questions with regards to the primary feeding practice (i.e. only breast milk, mainly breastmilk but also formula, mainly formula but also breast milk, only formula) and exclusivity (e.g. whether any liquids were given to the infant during the past 24 hours or since birth, including water, sugar water, fruit juice, chamomile tea, or any other liquid) – for operational definitions of breastfeeding and exclusive breastfeeding used in this study, see **Section 8.9**.
- They also responded with regards to the type, time of introduction and frequency of supplemental feeding, including formula, other liquids, medication, vitamin or mineral drops, Oral Rehydration Solution (ORS) etc up to that time point.
- They were also requested to record a 24h-recall of feeding practices (i.e. “Can you tell me which of the following products has your baby consumed in the last 24 hours?”), based on CDC’s IFP questionnaires used in the Infant Feeding Practices Study II (<https://www.cdc.gov/breastfeeding/data/879ifps/questionnaires.html>), which was modified accordingly based on the literature (Gaki *et al.* 2009) as well as recommendations of an expert panel of pediatricians and lactation consultants from the Cyprus Breastfeeding Association in order to take into consideration predominant local practices (e.g. aniseed tea).

- Finally, mothers who were breastfeeding at the first month of follow-up were asked to complete the Perceived Breastfeeding Self-efficacy – short-form scale (BSES-SF), in order to assess potential changes in maternal breastfeeding self-efficacy levels by the first month according to breastfeeding practices.

At 4th and 6th Month: Questionnaires used at 4th and 6th month (**Appendices J and K**, respectively) included questions to assess infant feeding practices based on self-reported current status, a 24-hour recall, as above, as well as a retrospective event calendar method.

- In terms of the 24-hour recall of feeding practices, the questionnaire was also based on the CDC's IFP questionnaires used in the Infant Feeding Practices Study II, but it was modified further based on recommendations of the expert panel to include liquids and solids that might be introduced at any time up to the sixth month.
- Participants were also requested to respond with regards to when liquids were introduced in the infant's feeding using the retrospective event calendar method. Specifically, participants were asked to respond to the following questions, with the response in all cases recorded in months and weeks.
 - “At what age was your baby given liquids e.g. water, chamomile, fruit juice for the first time?”
 - “At which age your baby stopped breastfeeding?” and
 - “At which age were semi-solid or solid food given for the first time? (i.e. rice cream, fruit cream/puree, mashed food), at the 6th month only
- Further, the **Perceived Infant Care Social Support** (PICSS) scale was included in the fourth month questionnaire and the **Workplace Breastfeeding Social Support** (WBSS) scale was included in the sixth month questionnaire – see next section for details.
- Finally, at the sixth month, participants rated the perceived importance of a list of fifteen reasons for **Discontinuing Breastfeeding** on a 5-Likert scale (1-strongly disagree; 5-strongly agree), adapted from a similar study (Gaki *et al.* 2009), or provide additional reasons if they wished (open-ended question).

8.7 Description of the Tools

8.7.1 WHO/ UNICEF BFHI self-assessment tool

The Section 4 of the WHO/UNICEF Baby-Friendly Hospital Initiative package for self-assessment and monitoring of Baby Friendly Hospitals contains a section that is directed at the maternity care facility management staff, and a separate section with a questionnaire specifically designed to be directed at breastfeeding mothers while at the clinic. “*The 10 Steps for Successful Breastfeeding*” self-assessment and monitoring questionnaire was developed and has been used as practical tool for receiving feedback from mothers with regards to their perceived maternal experience for BFHI’s “10 Steps”. It enables the maternity clinic to make an initial evaluation of the degree of adherence to the maternity practices. The tool was originally evaluated in two countries, Ireland and Zimbabwe, and it was subsequently modified accordingly to comply to the Global Criteria for BF (UNICEF/WHO, 2006). Since then, it has been used by more than 20.000 maternity clinics worldwide and it is available in all languages of the United Nations (UNICEF/WHO, 2006).

The tool covers Steps 3 to 10 as well as the International Code for Breastfeeding Substitutes (ICBS). Steps 1 and 2 are not included since they refer to the clinic's policy and the training of the staff, both of which refer to topics that the services users would not necessarily be aware of or able to comment. The tool consists of 24 multiple choice questions and related sub-questions, based on the “10 Steps”. Some are operationalized with a single question (Step 9 -*no use of pacifier*-was considered to be implemented if mothers responded negatively to the question “Has your baby sucked on a pacifier (dummy or soother), as far as you know, while you’ve been in the maternity unit?”), while others need the combination of items to be operationalized. For example, for the operationalization of full implementation of Step 4, two questions were used “How long after birth did you first hold your baby?” and “How did you hold your baby, this first time?”. A mother experienced full implementation of Step 4, if she provided one of the following responses to the first question: (1) immediately, (2) within 5 minutes, (3) within half one hour or (4) within an hour as well as the answer “skin to skin” to the latter question. The operational definitions of the steps in this thesis is discussed in **Section 8.10**. For most questions, if a positive answer is given, then it is considered a positive experience of that particular good maternity practice. The tool can be used by maternity

care units in the process of accreditation for Baby-Friendly Hospital status in order to examine adherence of the maternity clinic to the BFHI recommendations, and identify gaps in order to take corrective measures. If most of the questions were given a negative answer or the proportion of mothers exclusive breastfeeding is below 75%, then WHO/UNICEF suggest that the maternity clinic requires further work to adhere to the BFHI's maternity practices (UNICEF/WHO, 2009). If the proportion of EBF is over 75% and the set of responses with regards to the practices is suggestive of the implementation of the "10 steps" then the maternity clinic can proceed with the Baby-Friendly accreditation process. The actual accreditation process is complex, and it is beyond the scope of this thesis to describe. Permission to translate and use this scale was provided by the developers (**Appendix L (a)**).

8.7.2 Breastfeeding Self-Efficacy Scale

Perceived maternal breastfeeding self-efficacy was measured using the Breastfeeding Self-efficacy scale - short form (BSES-SF). This is the short-form of a longer 33-item tool developed by Dennis & Faux (1999) to measure postpartum breastfeeding self-efficacy and to identify mothers at high-risk of premature breastfeeding discontinuation. In its short-form, the BSES-SF contains 14 items with a five-point Likert scale response-set. All statements are phrased positively, and all begin with the phrase 'I can always...'. The response scale provided for each statement ranges from 1= not at all confident and 5=very confident. The theoretical range of the scale is 14-70, with higher scores indicative of higher levels of breastfeeding self-efficacy. There are no set cut-off values for the scale. However, it has been suggested in the literature that a 5-10 unit difference in the scale (approximately 0.5-1.0 SD) is clinically significant in terms of predicting breastfeeding success in the long-run. Commonly, the total score is calculated by aggregating the responses on all 14 statements. In the context of this thesis, it was decided to use the average score (rather than the overall score) i.e. dividing the total score by the number of items. Other than allowing the inclusion of a small number of questionnaires (N=27) for which an answer was not provided on all 14 statements, the main reason for this decision was to express the score of each individual on a scale of 1-5, again with the higher scores indicating higher levels of breastfeeding self-efficacy. Comparability with the published literature is retained, since average scores can be compared to overall scores by

multiplying by 14 (the number of items). For example, a score of 3.5 (on a 1-5 scale) corresponds to a score of 49 (on the 14-70 scale). Similarly, previous studies suggest that the variability in breastfeeding self-efficacy in various population groups is commonly around 10 (with a range of 7-14 observed across most population). This would correspond to a variability of 0.7 (range 0.5-1.0) on a 1-5 scale. Hence, the clinically significant change of 10 units in the sum scores would correspond to around 0.70, if expressed on a 1-5 scale, depending on the observed variability.

Initial evaluation of the psychometric properties of the scale was conducted using a population-based sample of 491 Canadian breastfeeding mothers (Dennis, 2003). The questionnaire was completed at first, fourth and eighth week postpartum. The factor analysis yielded a uni-dimensional structure and internal consistency of the scale was assessed with Cronbach 's α coefficient (0.94). In contrast, the initial 3-item BSES scale generated two dimensions (factors) - the breastfeeding technique and the intrapersonal thoughts subscales. Nevertheless, according to the developers the results of the short-form were more suitable for interpretation (Dennis, 2003). Predictive validity was assessed with the evaluation of the association of BSES-SF and infant feeding practices at four and eight weeks. The tool was used with permission by the developer who provided an existing Greek translation of the scale (**Appendix L (b)**). Nevertheless, a number of grammatical and syntax changes were deemed necessary, after a forward-backward translation process (see section Forward-Backward translation for more details).

The tool's development was based on the central construct of self-efficacy in Bandura's Social Learning Theory, and as already discussed (**Sections 5.1-5.3**) the tool has been translated in several languages and has been extensively used in different countries and among different population groups. In fact, our own literature review of studies looking at the association between breastfeeding self-efficacy and breastfeeding outcomes, suggests that the vast majority of studies in the international literature have used this scale. It is not surprising since other scales (for example, the Infant Feeding Intentions Scale and the Prenatal Breastfeeding Self-Efficacy scale) refer to pregnancy and intention to breastfeeding, while the H & H Lactation Scale refers to maternal perceptions of insufficient milk supply, rather than overall aspects of breastfeeding self-efficacy in general. Permission to translate and use this scale was provided by the developers (**Appendix L (b)**).

8.7.3 Perceived Infant Care Social Support Scale (PICSS)

The development of this scale was based on Social Exchange theory by Homans (1961) and Blau (1964) and the self-efficacy theory by Bandura (1977, 1994). It was developed by Leahy Warren (2005) in order to assess the level of functional (i.e. types) as well as structural (i.e. sources) social support provided to mothers with regards of infant care. A number of studies with breastfeeding or new mothers have used generic scales to measure social support (Akman *et al.* 2008). Unlike generic social support scales (e.g. the Medical Outcomes Study – Social Support Scale – MOS-SSS, or Multidimensional Scale of Perceived Social Support), which commonly measure the various dimensions of functional support, the PICSS was one of the few infant care-specific social support tool identified in the literature, which taps on several aspects of functional social support, namely, informational, instrumental, emotional and appraisal support. Another tool, which in fact is specific to breastfeeding, rather than infant care, is the Perceived Breastfeeding Support Assessment Tool (PBSAT), developed by Hirani *et al.* (2013). On the contrary to PICSS, the PBSAT does not measure the four dimensions (informational, instrumental and emotional support and appraisal) of social support. It comprises of 29 items of which 12 referring to the workplace environmental support and 17 to social environmental support. No consistency was, also, followed in the way the items were measured. Several items were measured at a 4-point likert scale with 1 either denoted with strongly agree or always and 4-strongly disagree or 4-never), whereas other items were answered by giving a “positive” or a “negative” or a “don’t know/ not applicable” response. Nevertheless, it was decided not to use a breastfeeding-specific social support scale, since by the 4th month of follow-up, it was anticipated that many of the participants would have returned to work and possibly discontinue breastfeeding. Thus, a scale that measures the level of support in the context of infant care in general was preferred. Furthermore, another strength unique to the PICSS is that it also incorporates a measure of structural social support. Thus, this would allow an exploration into the sources of support for women with newborn infants in Cyprus.

Specifically, the questionnaire composes of two parts – the function social support scale (an aggregate summative scale) and the structural social support, which explores the support the individual expects to have from the members of their social network.

The functional social support part of the scale is a 22-item self-reported instrument which taps on:

- the **informational** dimension of social support (7 item), for example “I can get information on taking care of my body after child birth”
- the **instrumental** dimension of social support (7 items), for example “I can get ‘hands-on help with changing/dressing my baby”
- the **emotional** dimension of social support (4 items), for example “I have someone to talk to about how I feel”, and
- the **appraisal** dimension of social support (4 items), for example “I have people who will show me appreciation for the care I give to my baby”

All items are anchored on a 4-point Likert scale without the middle point (1 – strongly disagree; 2 – disagree; 3 – agree; 4 – strongly agree). The instrumental and informational subscales scores ranged from 7-28 and the emotional and appraisal subscale scores ranged from 4-16. The sum of the subscale scores provide the overall functional social support score, with a theoretical range of 22-88. The higher the score, the more the perceived social support in relation to infant care. It is of note that the scale measures perceived (not received) social support. For the purposes of this thesis, the average (rather than the overall) scores for the sub-scales were used in order to allow comparisons across the different dimensions of social support.

The structural social support includes of a list of individuals in the mothers’ social networks’ divided into two categories: formal (e.g. midwife, nurse, doctor) and informal/lay (e.g. partner, mother, mother-in-law, friend, siblings) support, or report other person in an open-ended question at the end. The original list was modified by omitting specific specializations of health professionals that do not exist (e.g. public health nurses, practice nurses) or are not related with maternal BF support (e.g. local doctor) in Cyprus. On the other hand, others considered to be significant sources of maternal BF support were added in the list (e.g. pediatrician, gynecologist). Further, the term “housekeeper/nunny” was included in the category of informal support as many Cypriot women sometimes seek for help on infant care from women they employ to help them in housework. Responders are requested to indicate “**the persons who you expect to be supportive and helpful to you in caring for your baby**” for each of the four types of support. Hence, responders can tick as many people as they want for each of the types of support in a (number of people on the list) X 4 matrix as shown below.

Support Persons	Provide information	Carry out infant care tasks , such as	Show that they care, love and respect you in	Praise you for doing a good job in caring
If any of the names below are not applicable or relevant please leave blank (<i>tick more than one person as necessary</i>)	about caring for your baby in relation to feeding, changing, bathing and settling your baby	feeding, changing, bathing and settling your baby	caring for your baby	for your baby

Note that, again, the scale taps on perceived social support (“expect to be supportive”) and not received social support, which might indicate provision of support as a result of expressed need due to the existence of problems. Hence, received social support would be expected to positively (rather than negatively) correlate with adverse health outcomes as a result. Structural social support is assessed by estimating the proportion of participants that reported feeling that they can expect each of the individuals included in the list to be supportive in the care of their infant. It should be noted that for the purposes of this thesis, a number of categories of people (namely, GP and Public Health Nurse were removed from the list due to the mismatch with the local health care system), and replaced by Pediatrician, Gynecologist and other Health Professional. Furthermore, domestic worker/nanny were added. This is consistent with the use of the scale since an open-ended question is provided at the end for responders to add people as they see fit onto this list.

Cronbach’s alpha for internal consistency was 0.80 in the original study (Leahy-Warren *et al.* 2011). The Perceived Infant Care Social Support (PICSS) Scale was used in other studies (Leahy-Warren *et al.* 2005; Leahy-Warren *et al.* 2011; Shorrey *et al.* 2014). Permission to translate and use this scale was provided by the developers (**Appendix L (c)**).

8.7.4 Workplace Breastfeeding Support Scale (WBSS)

The Workplace Breastfeeding Social Support scale is a self-administered tool developed to measure breastfeeding support at the workplace (Bai, Peng and Fly, 2008). It consists of 12 items, each measured on a 7-point Likert scale, with 1 representing strongly disagree and 7 representing strongly agree. It is composed of four dimensions: peer support,

breastfeeding-friendly environment, technical support and facility support. Each dimension is composed of 3 items. The subscale scores are summed to produce an overall score ranging from 7 to 84, with higher scores reflecting higher levels of breastfeeding support at the workplace. In the original study, Cronbach 's alpha coefficient was 0.77 and split-half reliability was 0.86. Construct validity was established with the extraction of four factors by the performance of a factor analysis with a KMO measure of sampling adequacy of 0.71. The four factors accounted for 62.15% of the total variance of the scale and corresponded to four dimensions of perceived WBSS: technical (explained the largest proportion variance with 29.8%), peer and facility support as well as BF-friendly environment (Bai, Peng and Fly, 2008). A number of other workplace breastfeeding support were identified in the literature (Bar Yam, 1998; Greene and Olson, 2008); however, they were not considered eligible for use because of their extensive length. Furthermore, it was short, and easy to understand; thus appropriate to administer over the phone as it requires only few minute to be completed. Permission to use the questionnaire was granted by the developers of the scale (**Appendix L (d)**).

8.7.5 Perceived Reasons for Breastfeeding Discontinuation

At the sixth month of follow-up, mothers were also asked to rate on 5-point Likert scale, with 1=strongly disagree and 5=strongly agree, the importance they personally attributed to a list of 15 reasons for discontinuing breastfeeding, including insufficient milk, inadequate weight gain, breast problems, house and children responsibilities, fatigue, etc. The list was adapted from a similar study in Greece (Gaki *et al.* 2009). However, unlike the original study, it was decided to ask the participating mothers to rate each of these reasons, while they were also given the chance to provide additional reasons if they wished.

8.7.6 Forward-backward translation

For English-speaking participants, the original scales were used. Two of the questionnaire scales used in this study had already been translated in the Greek language. The WHO/UNICEF self-assessment and monitoring questionnaire was translated into Greek by a team of specialists at the Attiko University Hospital under the supervision of Dr. Mexi Bournas (UNICEF / WHO, 2006). For the purposes of this study, the existing Greek

version was used, with the permission of the Greek National Commission of UNICEF. An existing Greek-version of the Breastfeeding Maternal Self-Efficacy scale- short form was also provided by the developer of the scale (L Dennis). However, a number of grammatical and syntax changes were deemed necessary, after a forward-backward translation process, in order to improve its readability. The main change was in terms of the correct use of the tense for the key verbs to refer to a continuing process rather (i.e. “Μπορώ πάντα να αξιολογώ ότι το μωρό μου παίρνει αρκετό γάλα”) rather than in the original (“Μπορώ πάντα να αξιολογήσω ότι το μωρό μου παίρνει αρκετό γάλα”). To give another example “Μπορώ πάντα να ολοκληρώσω να θηλάζω το μωρό μου με το ένα στήθος πριν αλλάξω στο άλλο” was altered to “Μπορώ πάντα να ολοκληρώνω το θηλασμό με το ένα στήθος πριν αλλάξω στο άλλο”. A number of other syntactical changes were also deemed necessary to improve its readability, for example “Μπορώ πάντα να διατηρώ τη θέληση μου να θηλάζω” rather than “Μπορώ πάντα να θέλω να συνεχίζω να θηλάσω” in the original, which is more awkward to read.

Finally, as the completion of the scale at the first month of follow-up was by means of a telephone interview, it was decided to alter slightly the instructions given to the participants at the beginning, since they wouldn't have a paper-copy of the questionnaire in front of them. Specifically, in the original the following instructions are provided: “For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by circling the number that is closest to how you feel. There is no right or wrong answer”. A response set is provided: 1 = not at all confident, 2 = not very confident, 3 = sometimes confident, 4 = confident, 5 = very confident, for all the points on the response scale. In the case of the telephone interview, the interviewer explained that after each of the 14 statements, a response on a 1-5 scale was required, whereby 1 refers to “not feeling sure/confident” while responding 2, 3 and 4 represent more confidence, up to 5 which represents that for the particular item you are “feeling very sure/confident”. Note that the words “confidence” and “confident” in the original Greek version appeared as «νιώθω σιγουριά» και «νιώθω σίγουρη» even though the word «αυτοπεποίθηση» appears in the title of the scale. In the final version, both words were used in tandem.

Neither the PICSS not the WBSS questionnaire were available in Greek. These were translated in Greek following a double forward-backward translation to ensure linguistic and cultural equivalence. Specifically, the researcher and the main supervisor (both

trained in the UK) translated the tools in Greek, and the draft Greek versions were back-translated in English by two independent translators (members of the wider research team) who were familiar with both the Greek and English language and culture. Any differences were discussed by an expert panel, and the final version was agreed upon consensus.

8.8 Follow-up

According to our conclusion from the literature review, both the duration of the follow-up (i.e. 4-8 weeks to 6 months) as well as the selection of actual time-points for follow-up (i.e. 2nd, 3rd, or 4th month) is largely inconsistent across studies, and it is mainly based on the context as well as the particular aims of the each study. For instance, validation studies of breastfeeding self-efficacy scales tend to have shorted follow-ups compared to observational epidemiological studies which aim to provide breastfeeding indicators in the long-term.

This is the first study to estimate breastfeeding indicators past 48-hours in Cyprus, thus there was no local evidence-base to inform the decision with regards to the specific time-points for the telephone follow-up. Months one, four and six were chosen. The first month after the infant's life (4 weeks) is commonly chosen by other studies internationally. In the context of this study, it was expected to be the appropriate time point for assessing possible changes in the levels of self-efficacy among breastfeeding mothers, and before the breastfeeding rates were expected to begin to drop. The legal duration of maternity leave of full-time employed in Cyprus is 18 consecutive weeks, of which 11 weeks are compulsory (two before the week of the expected date of birth, the week of the birth, and 8 weeks after the birth). Hence, most women return to work between the 3rd and 4th month after birth. It was decided to assess the infant practices of women around when or after they return to work, when it was anticipated that the breastfeeding rate will show a sharp decline. Furthermore, the 4th month time-point was deemed appropriate to assess the perceived social support in the care of the infant, once the mother would have returned to work, and thus coping with the demands of infant care are expected to rise. In retrospect, the long period between the first (1st month) and second follow-up (4th month) did not allow the study to identify the exactly when in this period breastfeeding most likely discontinues. Finally, the 6th month follow-up was naturally chosen since this is the recommendation of WHO for exclusive breastfeeding. It was also assumed that the 6th month was an appropriate time-point to assess the working mothers' perception of how

breastfeeding-friendly their workplace, after their return to work, and would have already had experience in trying to manage the demands of breastfeeding and working life.

8.9 Definition of Breastfeeding Variables

Estimation of Breastfeeding (BF) and Exclusive Breastfeeding (EBF) indicators was based on the recommended WHO definitions of Breastfeeding (WHO, 2008). Breastfeeding was considered exclusive, if an infant did not receive anything other than breast milk, with the exception of medication, vitamin or mineral drops, Oral Rehydration Solution etc. An infant was considered to be breastfeeding if he/she received breast milk in addition to any other liquid or food, including formula. The study did not use other definitions encountered in the literature; for example, full breastfeeding, partial breastfeeding and so on.

8.9.1 Estimation of Breastfeeding Indicators

Specifically, estimates for the prevalence of breastfeeding (BF) and exclusive breastfeeding (EBF) were based on the following questions at each time point of interest

8.9.1.1 At 48 hours:

A question on the breastfeeding status during the first 48 hours (“Have you breastfed your newborn baby in the first 48 hours?”), which was included in the baseline questionnaire, was used to initiation of breastfeeding. The data were expressed as a binary variable. Regarding the estimation of exclusivity in breastfeeding, the set of questions referring to Step 7 “Implementation of Exclusive Breastfeeding” were used, as phrased in Section 4 of the BFHI (Baby Friendly Hospital Initiative) questionnaire for mothers’ self-assessment of maternity unit practices were used. This included

- A negative response to the question: “*Did your baby receive any supplement?*” which had to be also confirmed by
- A negative response to the question: “*Did your baby receive any of the following?*” referring to any supplementation (formula, water or sugar water, other fluids).

Missing or inconsistent information was considered a negative response regarding BF and EBF respectively.

8.9.1.2 At the 1st month:

At the first month of follow-up, the estimation of the prevalence of BF and EBF followed the same rationale and was based on mother's response to the following questions:

- “Does your baby receive: (a) only breastmilk, (b) mainly breastmilk, but also formula, (c) mainly formula, but also breastmilk or (d) only formula”, and
- “Until today, has your baby received: (a) water or sugarwater, (b) chamomile tea or other tea, (c) fruit or vegetable juice or any other liquid?”.

Thus, any response other than “only formula” in the first question was considered as breastfeeding. While, in the case for exclusive breastfeeding, in addition to the response of “only breastmilk”, EBF status was defined as a negative response to having received any liquid up the point of conducting the interview.

8.9.1.3 At 4th and 6th Month:

At both the fourth and sixth month of follow-up, any mother who responded positively to the question:

“Do you still breastfeed?” was considered to still to be breastfeeding.

A response of “only breastmilk” to the same question as above was considered EBF, together with a negative response to the question

“Until today, has your baby received (a) water or sugarwater, (b) chamomile tea or other tea, (c) fruit or vegetable juice or any other liquid? ”, as well as a negative response to the question

“Until today, has your baby received: (a) fruit puree , (b) any ready-made baby cereal or food , (c) mashed or solid food?”.

Generally, effort was made so that the follow-up interviews were conducted within a week of the fourth and sixth month of the infant's life. Nevertheless, in some cases there was a longer delay in interviewing participants. In order to correct for the fact that BF or EBF cessation can occur in this critical time points, the self-reported month of breastfeeding cessation and of liquid/solid introduction was also taken into account to determine EBF or BF status at the fourth and sixth month.

8.9.1.4 24-hour recall method

In addition, a 24-hour recall of feeding practices was reported by mothers at every follow-up. The list of items in the questionnaire was based on CDC's IFP questionnaires used in the Infant Feeding Practices Study II (<https://www.cdc.gov/breastfeeding/data/ifps/questionnaires.htm>), which was slightly modified in order to take into consideration cultural differences and some predominant local practices (e.g. aniseed tea). These were based on the literature (Gaki *et al.* 2009) as well as recommendations of an expert panel of pediatricians and lactation consultants from the Cyprus Breastfeeding Association. Similarly, the IFP questionnaire was further modified accordingly for the fourth and sixth month follow-up in order to include other liquids and solids that might be introduced at any time up to the sixth month. Foods excluded from the initial list were French fries, soy foods, peanut butter/peanut foods/nuts, while foods such as ricecream, commercial fruitcream, soups, usually introduced with the initiation of Complimentary feeding in Cyprus were included in the 24-hour recall list.

Table 8.2: Questions included in the Questionnaires for the estimation of BF and EBF rates

	BF Status	BF considered	EBF Status	EBF considered
48 Hours	<i>“Has your baby breastfed during the first 48 hours?”</i>	<i>Positive Response</i>	<i>Has your baby been given anything other than breast milk since it was born?</i> <i>If yes, what was given? (Step 7 Questions of the WHO questionnaire for successful breastfeeding)</i>	<i>Negative response</i>
1st Month	<i>Now that you have reached your first month, how are you feeding your baby?</i>	<i>Only Breastmilk</i> <i>Breastmilk but also formula, Formula bit also breastmilk</i>	<i>Until today, has your baby received (a) water (b) tea (c) juice?</i>	<i>Negative response</i>
4th Month	<i>Does your baby continue to breastfeed?</i>	<i>Positive Response</i>	<i>How do you feed your baby?</i> <i>Until today, has your baby received (a) water (b) tea (c) juice?</i> <i>Until today, has your baby ever had (a) fruit puree / cream, (b) Other creams (e.g. farin lactee, ricecream), (c) Mashed food or solid food</i>	<i>Only breastmilk</i>
6th Month	<i>Does your baby continue to breastfeed?</i>	<i>Positive Response</i>	<i>How do you feed your baby?</i> <i>Until today, has your baby received (a) water (b) tea (c) juice?</i> <i>Until today, has your baby ever had (a) fruit puree / cream, (b) Other creams (e.g. farin lactee, ricecream), (c) Mashed food or solid food</i>	<i>Only breastmilk</i> <i>Negative response</i> <i>Negative response</i>

8.10 Definition of the “10 Steps” Variables

There is no consistency in the literature in terms of the operationalization of the degree of implementation of the 10 steps. In some studies, adherence of the 10 Steps is assessed as a series of binary variables (DiGirolamo, Grummer-Strawn and Fein, 2001; DiGirolamo, Grummer-Strawn and Fein, 2008), whereas other studies measure maternity care practices based on the extent are partially or fully implemented (Hadjiona *et al.* 2016). Some studies assess each step separately while also defining the degree of implementation as full or partial (depending on the complexity of that step; for instance, step 4 refers to both holding the baby within half/one hour and skin-to-skin). Yet; other studies include only specific maternity care practices in their investigation, rather than all the steps as a pack, and leave others out (DiGirolamo, Grummer-Strawn and Fein, 2001).

In order to determine the proportion of mothers who experienced each of 10 Steps, in the context of this thesis, both each individual component of a step (where that applies) as well as the full implementation of the step were assessed. For example, we determined the proportion of mother who relied to positively to each of the two components of Step 4, skin to skin and early initiation of BF, as well as the proportion of mothers who responded to both components positively, defined as full implementation of that Step. The decision was taken in order for the data to provide a more detailed depiction as to which practices are sub-optimally implemented as well as to allow comparisons with other studies that may have looked at certain components separately.

Another example is the operationalization of Step 3, for which full implementation would be defined by the positive response to four questions: (1) “During these visits did the staff discuss at individual or group level about your baby’s feeding?”, (2) “During these visits did the staff give you any information on the importance of spending time skin-to-skin with your baby immediately after birth?”, (3) “During these visits did the staff give you any information on the importance of having your baby with you in your room or bed 24 hours a day?”, (4) During these visits did the staff give you any information on the risks of giving water, formula or other supplements to your baby in the first six months if you are breastfeeding?”. In this case, a binary definition of no versus full implementation was expected to classify very few participants into the “full implementation” category. Hence, in order to avoid multiple combinations of responses, and hence categories of implementation without a hierarchical structure, we defined the specific variable on the

basis of three categories: no implementation (defined as no positive response to any of the four statements); partial implementation (defines as a positive response to at least one out of the 4 statements, but not all four) and full implementation (defined as a positive responses to all four statements).

Table 8.3 presents the operational definition used for each of the steps, as well as the numbering of questions from the self-administered **WHO/ UNICEF questionnaire - Section 4** in **Appendix H** (UNICEF/WHO, 2006) used in the calculation and the response set (categories of implementation) in each case.

It should be noted that the above operational definitions were used in the descriptive analysis of the overall degree of implementation of the 10 steps. In the case of regression models investigating the self-reported experience of participants with regards to the 10 steps with BF initiation, continuation and exclusivity as well as maternal BSES, slightly different definitions were used to construct the variables. In this case, any steps composed by more than one maternity practices (i.e. Steps: 3, 4, 5 and 8) were entered in the model as a three level variable, defined by no, partial and full implementation. To give an example: in relation to Step 5, mothers who provided a negative answer to both questions:

- “Did the staff offer you any help with breastfeeding since that first time? (Q10)“ and
- “Did the staff give you any help with positioning and attaching your baby for breastfeeding before discharge? (Q11)”, were considered as not having experienced the Step.

If a positive response was provided to either one of the aforementioned questions then the Step was considered to be partially implemented. Mothers who responded positively to both questions, were considered to have fully experienced this step.

For all the Steps which are operationalized in the questionnaire with the use of only one question (commonly, with a binary yes/no response), such as rooming-in, then a binary variable was used to classify participants into those who have responded positively and those who have responded negatively in the implementation of that practice..

Table 8.3: Definition and Operationalization of the 10 steps as used for the purposes of the study

Steps	Step Description	Questions that describe each Step in the questionnaire	Questions included in the analysis for the Description of the step	Step Definition for the estimation of BF rates and mean BSES according to the implementation of the Steps	Step Definition for the investigation of the association of BF/EBF initiation and continuation and BSES (in-hospital and first month) with the implementation of the steps
Step 3:	Any information given per partum on Breastfeeding practices	Q2 (referring to Breastfeeding” Q3.1 Q3.2, Q3.3	Q2, Q3.1, Q3.2, Q3.3	3 categories: No implementation: no positive response to all questions Partial: positive response to 1 up to 3 questions Full: positive response to all questions	3 categories: No implementation: no positive response to all questions Partial: positive response to 1 up to 3 questions Full: positive response to all questions
Step 4:	Mother held the infant within one hour after birth (half an hour) (a) Time of holding the infant after birth (within 1 hour) (b) Implementation of the skin to skin practice	Q6 (Time of holding the baby) Q7 (Skin to skin)	Q6, Q7	No implementation: response to Q6 did not include the following answers: “ <i>immediately, within 5 mins, within 30mins, within 1 hour</i> ’ or response to Q7 did not include the answer “ <i>skin to skin</i> ’ (included the answer “ <i>wrapped with no much skin contact</i> ”) Implementation of the maternity practice Skin to skin: the answer “ <i>skin to</i>	3 categories: No implementation: both responses to Q6 and Q7 did not include the following answers: “ <i>immediately, within 5 mins, within 30mins, within 1 hour</i> ’ and the answer “ <i>skin to skin</i> ’ (included the answer “ <i>wrapped with no much skin contact</i> ”), respectively Partial: answers to either of the two questions (Q6 or Q7) included “ <i>Skin to skin</i> ” or “ <i>Holding the baby within 1h</i> ” Full: both “ <i>skin to skin</i> ’ and one of the following “ <i>immediately, within 5 mins,</i>

Steps	Step Description	Questions that describe each Step in the questionnaire	Questions included in the analysis for the Description of the step	Step Definition for the estimation of BF rates and mean BSES according to the implementation of the Steps	Step Definition for the investigation of the association of BF/EBF initiation and continuation and BSES (in-hospital and first month) with the implementation of the steps
				<i>skin</i>’ was given as a response to Q7 Implementation the maternity practice “Within 1h after birth”: one of the following answers were given as a positive response to Q6 “<i>immediately, within 5 mins, within 30mins, within 1 hour</i>’ Full: both “<i>skin to skin</i>’ and one of the following “<i>immediately, within 5 mins, within 30mins, within 1 hour</i>’ were given as positive responses to full implementation	<i>within 30mins, within 1 hour</i>’ were given as positive responses to full implementation
Step 5:	Help offered by staff on breastfeeding Help given on positioning and attaching the baby	Q10, Q10.1, Q10.2, Q10.3 Q11, Q12	Q10 Q11	nNo implementation: negative response to both questions Q10 and Q11 Help offered: positive response given to question Q10 Practical assistance: positive response given to question Q11	No implementation: negative response to both questions Q10 and Q11 Partial: positive response to either of the two questions (either Q10 or Q11) Full: positive response to both two questions (Q10 and Q11)

Steps	Step Description	Questions that describe each Step in the questionnaire	Questions included in the analysis for the Description of the step	Step Definition for the estimation of BF rates and mean BSES according to the implementation of the Steps	Step Definition for the investigation of the association of BF/EBF initiation and continuation and BSES (in-hospital and first month) with the implementation of the steps
				Full: positive response to both questions(Q10 and Q11)	
Step 6: EBF	Implementation of Exclusive Breastfeeding	Q16 Q17	Q16 Q17	See Section 8.9	See Section 8.9
Step 7: Rooming In	Practice rooming-in	Q13	Q13	Implementation: rooming in was given as answer in question Q13	Implementation: rooming in was given as answer in question Q13
Step 8: BF on Demand	(a) Advice given on the frequency of breastfeeding	Q14	Q14	No Implementation: Answers every time the baby wants to and as long as the baby was wants to were not given as responses to questions Q14 and Q15, respectively	No Implementation: none of the answers were given in response to questions Q14 and Q15
	(b) Advice given on the duration of breastfeeding	Q15	Q15	Any time the baby wants to: Answer every time the baby wants to was not given as response to questions Q14	Partial: either every time the baby wants to or as long as the baby was wants to were not given as a response to questions Q14 and Q15, respectively
				As long as the baby wants to: Answer as long as the baby was wants to was given as a response to question and Q15	Full: both answers every time the baby wants to and as long as the baby was wants to were given as responses to questions Q14 and Q15

Steps	Step Description	Questions that describe each Step in the questionnaire	Questions included in the analysis for the Description of the step	Step Definition for the estimation of BF rates and mean BSES according to the implementation of the Steps	Step Definition for the investigation of the association of BF/EBF initiation and continuation and BSES (in-hospital and first month) with the implementation of the steps
Step 9: Use of Pacifier	Use of pacifier or other artificial teats (dummies)	Q21 Q22	Q21	Negative response to Q21 (Binary variable)	Negative response to Q21 (Binary variable)
Step 10:	Support provided after discharge	Q24.1	Q24.1	Positive response to Q24.1 (Binary variable)	Positive response to Q24.1 (Binary variable)
	Implementation of the ICBSP	Q23	Q23	Negative response to Q23 (Binary variable)	Negative response to Q23 (Binary variable)

8.11 Ethical considerations

All necessary approvals were obtained before the initiation of the study (**Appendix M**). This includes approval from the Cyprus National Bioethics Committee, the Research Promotion Committee of the Ministry of Health, which also grants permission of access to public hospitals, as well as all the participating public and private maternity clinics. Furthermore, notification was sent to the Commissioner of Personal Data Protection. Approvals for the use of all tools in the study were received by the developers (**Appendix M**).

In terms of the procedures, an invitation letter was sent to maternity clinics along with an information leaflet detailing the objectives, procedures and expected results of the study. Access to each participating clinic was approved by the administration. Participation of the clinics in the study is on an anonymous, and the analysis and presentation of the data were on an aggregate basis (public vs private sector), and not at the level of individual clinics. No maternity care units participating in this study were named. The anonymity of the six clinics which opted out of the study was also preserved. In fact the clinic-level variable was coded for purposes of both data entry and analysis; thus, the data analysts were not aware of the clinic each participant gave birth during the interviews.

Written informed consent was obtained from all mothers for their participation in both phases of the study. In fact, as also mentioned earlier, a separate consent was obtained from participants for each phase of the study, since participation in the second phase required the provision of personal contact details (telephone number and/or email). Any mother who wished to participate in the study at the baseline investigation, but of thereafter, was permitted to do so. Confidentiality and anonymity was assured. Mothers were informed that their participation was on volunteer basis and that they could withdraw their participation at any time point of the study.

After receiving the signed consent, the participants responded to the questionnaire in their own time and privacy, while the field-workers were waiting outside the room. The questionnaires were returned in a sealed envelope, which was number/ID coded along with the consent form in order to allow the matching of individuals at the follow-up phase of the study. The consent form was placed in a separate dossier and was delivered

on a weekly basis by the field-workers to the Scientific Adviser of the study, and were stored in a secure cabinet, organized chronologically by data of delivery in order to facilitate the order of the telephone interviews. The completed anonymous questionnaires were delivered to the main researcher in paper-form. Once the data were entered in the statistical package, the questionnaires were stored in a secure cabinet, in a different office from the consent forms. During the follow-up phase of the study, only the main researcher who conducted the interviews has access to the consent forms with the contact details of the participants. The phone numbers were not entered into the database.

Field-workers employed at the baseline phase of the study were all students or graduates of midwifery, nursing or an allied health profession, and were thus trained in communication skills during their academic and clinical training. They were also given a short training in the form of a workshop before the initiation of the recruitment stage of the study. The workshop was run by an academic and a clinical midwife, and focused on the sensitive state and the fatigue that mothers commonly experience after childbirth. The field-workers were reminded for the need to show courtesy and inspire confidence in their communication, as well as the need to respect the privacy of the participants. The program of visits in each site was decided after consultation with the local staff in order to coordinate the visiting hours with the clinic's routine and avoid hours that were inappropriate (resting, visits from family and friends, etc). In cases when a prospective participant expressed her intention to participate, but the time was not convenient, then the field-workers were instructed to leave the questionnaire pack and arrange a day and time to return to collect it either from the mother directly or the maternity clinic staff (commonly the receptionists) depending on the mother's preference. None of the field-workers (nurses / midwives) were employed in these clinics; thus, participation in the study was not in any way connected with the services received by the participants. Furthermore, the field-workers were clearly instructed to respect the clinic's routine and avoid providing information and advice.

8.12 Statistical Analysis

Summary statistics (frequencies and mean/SD as appropriate) were used for the description of the socio-demographic characteristics of the participants at baseline, the estimation of mean BSES at baseline and first month and the description of adherence to the 10 Steps.

Differences in sociodemographic and other characteristics between mothers who did and did not participate at follow-up were assessed using chi-square tests for categorical variables and independent t-test for continuous variables. The prevalence of BF/EBF was estimated based on the total number of mothers in the sample at each time point according to the operational definitions described above. Mothers who reported BF or EBF cessation at the first or fourth month were included in the sample and retained their BF/ EBF status irrespective of non-participation at subsequent time points. Estimation of the 95% confidence intervals for prevalence estimates were calculated based on the normal distribution approximation with the exception of the 6th month EBF estimate, which due to the very low numbers, exact binomial distribution was used instead. Differences in the prevalence of BF and EBF according to sociodemographic and other characteristics of the mothers or differences between public and private sector were explored in chi-square tests. P-value for trend was also calculated in the case of ordinal variables.

The internal consistency of each of the scales used (BSES, PICSS and WBSS) was estimated using Cronbach's alpha coefficient. The construct (factorial) validity of the scales was examined by performing an exploratory factor analysis using a principal component analysis model. Concurrent and predictive validity of BSES was explored with the investigation of the association of breastfeeding self-efficacy as measured by the tool at baseline and at first month with infant feeding practices postpartum.

Maternal Breastfeeding Self-Efficacy was expressed as a continuous variable (i.e. average scale score) as well as an ordinal variable (i.e. sample quartiles based on the average scale score). A statistical criterion to classify the participants according to levels of breastfeeding self-efficacy was used due to the lack of generally accepted and uniform cut-off points across populations. Differences in mean BSES between

subgroups of participants based on their sociodemographic and other characteristics were explored using one-way analysis of variance (ANOVA) for nominal and ordinal variables and independent t-test for binary variables. Bonferroni post hoc comparisons were performed to investigate the association between subgroups of a categorical variable where necessary. A series of chi-square tests was used to assess the difference in the prevalence of BF and EBF across the four time points measured (baseline, 1st, 4th and 6th month) by quartiles of increasing level of BSES as measured at baseline or at the 1st month). Odds ratios (and 95% CI) of BF/EBF at each time point by the series of variables of interest, including quartiles of BSES, the self-reported experience of the 10 Steps and sociodemographic or other characteristics, were estimated in binary logistic regression models. The association of BF and EBF with sociodemographic or other characteristics was explored further in multivariable logistic regression models, before and after mutually adjusting for each other. Multivariable logistic regression was also used to further explore the association of BF and EBF with BSES after controlling for potential confounding factors. Specifically, models estimated the association before and mutually adjusting for sociodemographic and other characteristics including maternal age, education attainment, marital status, employment status, net family income, mode of delivery, intention of EBF and parity. Furthermore, a stepwise regression model was used to investigate the association of BSES (either as measured in hospital or at first month) with sociodemographic and other characteristics in order to identify the factors that best predict breastfeeding self-efficacy. In terms of the association of the self-reported experience of the series of “10 steps” (independent variables) with BF/EBF initiation and continuation as well as BSES (in-hospital or at first month) as dependent variables, a series of logistic and linear regression models were performed respectively. Stepwise regression models were used in order to identify the association of the 10 steps with each of the study outcomes of interest before and after mutually adjusting for each other.

Original as well as post-hoc calculations of sample size and statistical power for the associations of interest were performed with the use of G-Power software. Estimation of the 95% confidence intervals for prevalence estimates were calculated using EpiInfo. Statistical Package for Social Sciences (SPSS) for Windows Version 21 (SPSS Inc., Chicago, IL, USA) was used for all other analyses.

Chapter 9:

Participant socio-demographic characteristics and synopsis of main findings

The next five chapters present the findings of this study. This chapter (**Chapter 9**) focuses on the description of the study sample at baseline and across the three follow-up time-points. The socio-demographic and other characteristics of the full sample will be presented as well as the differences in the characteristics between those who did and did not participate at the follow-up as well as between the private and the public sector.

Subsequently, each chapter will present the findings of this study in detail, organised according to the main objectives. **Chapter 10** will present the findings with regards to the prevalence and main determinants of breastfeeding and exclusive breastfeeding at 48 hours and in the long-term. As it will show, while initiation of breastfeeding was relatively high (84.0% private and 84.5% public sector), the prevalence of exclusive breastfeeding at 48 hours did not exceed 23.6% in the public and 16.0% in the private sector. One in two women in public hospitals had a vaginal delivery, while in the private sector the rate of vaginal birth did not exceed 36.9%. A gradual reduction in EBF was observed, even though by the sixth month only 5% (95% CI: 3.1%-7.5%) of the mothers were still breastfeeding exclusively. In contrast, premature discontinuation of BF was recorded with the highest reduction observed after the first and before the fourth month. By the 6th month, 32.4% (95% CI: 27.7%-37.2%) of the participants were breastfeeding. For primiparas and those who gave birth by C/S, even lower rates of initiation, exclusivity and duration of breastfeeding were recorded. There was evidence of a social gradient and mothers of higher social position in terms of income or education were more likely to breastfeeding, to breastfeed exclusively and to breastfeed longer.

Chapter 11 will look at the level of perceived breastfeeding self-efficacy among the women who participated in the study. Breastfeeding self-efficacy was only moderate, and lower among primiparas, those who delivered by caesarian section and those who did not experience the WHO's "10 steps". While higher levels of self-efficacy were not associated with the likelihood of breastfeeding initiation, there was a clear stepwise

association between self-efficacy and exclusivity. The quartile of mothers with the highest levels of self-efficacy at 48 hours were five time more likely to breastfeed exclusively (40.5% vs 7.9% among those with the lowest levels). The association between in-hospital breastfeeding self-efficacy and EBF persisted at the 1st (OR= 5.0 95% CI 1.5-16.6), 4th (OR=8.5 95% CI 1.7-43.5) and 6th (OR=5.7 95% CI 0.6-56.5) month, even after adjusting for socio-demographic characteristics including mode of delivery, parity and social position. Similar, if not even stronger associations were observed between self-efficacy as reported at the 1st month and the prevalence of BF/EBF at subsequent time-points.

Chapter 12 presents the findings in terms of the implementation of the “10 steps” and the ICMBS code across maternity care units in Cyprus, as reported by the participating mothers. There appears to be relatively good adherence to the ICMBS across Cypriot maternity units. A higher degree of implementation was also observed in terms of assistance in breastfeeding skills development (step 5) along with advice for breastfeeding on demand (step 8). However, only 26.1% of mothers experienced skin-to-skin contact (step 4), while rooming-in (step 7) was more likely to be practiced in the public sector (28.5%) compared to the private sector (19.7%). Predictors of BF in stepwise models were holding the baby within one hour, practical assistance, implementation of the marketing code, no use of pacifiers and guidance for community support. For EBF, the strongest predictors were holding the baby within one hour, no use of pacifiers as well as skin-to-skin, rooming-in and receiving prenatal information. Mothers who practiced skin-to-skin and did not use pacifiers were 3-4 times more likely to EBF in the long term. Associations with skin-to-skin did not attenuate after adjustment for mode of birth, parity, education, income and employment status.

Finally, **Chapter 13** presents the findings in terms of the perceived social support in infant care and workplace breastfeeding support. Overall social support in infant care was moderate (M=3.10, SD=0.53) on a four-point scale, with lower levels of instrumental support (M=2.81, SD=0.57). A social gradient was apparent in favor of mothers of higher socioeconomic position, even though differences were statistically significant only with regards to instrumental and emotional support. The partner was the main source of instrumental, emotional and appraisal support (70-85%), followed by maternal grandmothers (60-70%) with less than a third naming any other person. In terms of informational support, pediatricians ranked first (73%) closely followed by

grandmothers (69%), with less than a quarter listing the partner, other health professionals, other family members or friends. While peer and environmental support in the workplace were moderate, workplaces were not rated as breastfeeding friendly in terms of facilities ($M=2.74$, $SD=0.99$) and technical support ($M=2.92$, $SD=1.62$) on a 7-point scale.

9.1 Study sample at baseline

A total of 1006 mothers were approached during the period of study. According to the Cyprus Perinatal Report, there were 9499 live births in Cyprus. This corresponds to 791.5 on average per month, or 182.7 per week). With a 6-week minimum stay in all maternity clinics across the island, as per the study protocol, the expected number of births during this period would be 1096. This is consistent with what was observed, given that two clinics did not participate in the study. Of the 1006 mothers, 797 fulfilled all the eligibility criteria. In terms of the main reasons the rest ($N=209$) did not fulfill the inclusion criteria: these include 118 with a premature and/or low birthweight baby and/or transfer in an NICU away from the main clinic of birth. This corresponds to an observed proportion of preterm births of around 11.7% which is, again, within the expected rate reported in official statistics (i.e. 10.3%-11.2% for low birthweight (<2500 gr) and preterm birth (<37 weeks) respectively. A number of mothers ($N=80$) did not participate because they did not speak or read either English or Greek, only 2 mothers were under 18 years of age and 19 mothers were excluded based on their medical record (other reasons).

The baseline sample consisted of 586 mother-infant dyads (response rate 73.5% among those eligible to participate). Across the five districts of the island, 41.1% gave birth to one of the participating hospitals in Nicosia. Significantly lower was the proportion of mothers that gave birth in hospitals in Limassol with 24.7%, followed by 16.2% and 10.2% s in Larnaka and Paphos, respectively. Only 7.7% of the mothers gave birth in maternity clinics in Ammochostos. As shown in **Table 9.1**, these findings show that the sample distribution of births is similar to the national distribution of births across the districts with slightly higher participation in the district of Nicosia and Ammochostos and lower in Limassol.

Table 9.1: *Comparison of the distribution of Births across the Districts in sample and nationally*

	Nicosia	Limassol	Larnaca	Paphos	Ammochostos
National	N(%)	N(%)	N(%)	N(%)	N(%)
2012	3.955 (39.0)	2.708 (27)	1.732 (17.0)	1.107(11.0)	628 (6.0)
2013	3.660 (40.0)	2.577 (28)	1.523 (16.0)	942 (10.0)	530 (6.0)
2014	3.540 (38.4)	2.613 (28.4)	1.522 (16.5)	977(10.6)	558 (6.05)
Sample					
	241 (41.1)	145 (24.7)	95 (16.2)	60 (10.2)	45 (7.7)

Source: Statistical Services of Cyprus

Amongst the 586 participants at the baseline phase of the study, 372 (response rate: 63.5%), 383 and 340 mothers were contacted by telephone at first, fourth and sixth month, respectively. The main reason for loss-to-follow up between baseline and first follow-up was not providing contact details (telephone and/or email). There was a small number of cases where even though a telephone number was provided, this was an invalid or the wrong number. As mentioned previously, a separate consent form for participating in the two phases of the study was requested, in order to ensure a higher rate of participation at baseline. A comparison between participants and non-participants in the second phase of the study was possible since all mothers provided socio-demographic characteristics at baseline phase, including information with regards to breastfeeding intention and previous breastfeeding experience. Loss-to-follow up was minimal across the subsequent phases of the study. In fact, a number of mothers (N=11) who did not participate in the first-month follow-up, participated in the second follow-up, explaining the slightly higher number of participants at the fourth month of the study. Furthermore, it was apparent that mothers who were lost to follow-up between the various stages were more likely to have already discontinued breastfeeding. Hence, in most cases, they could be included in the calculation of the prevalence of breastfeeding and/or exclusive breastfeeding based on the relevant information provided during previous follow-ups. **Figure 9.1** shows a flow diagram of participation of mothers at each stage of the study.

Figure 9.1: *Participant Flow diagram*

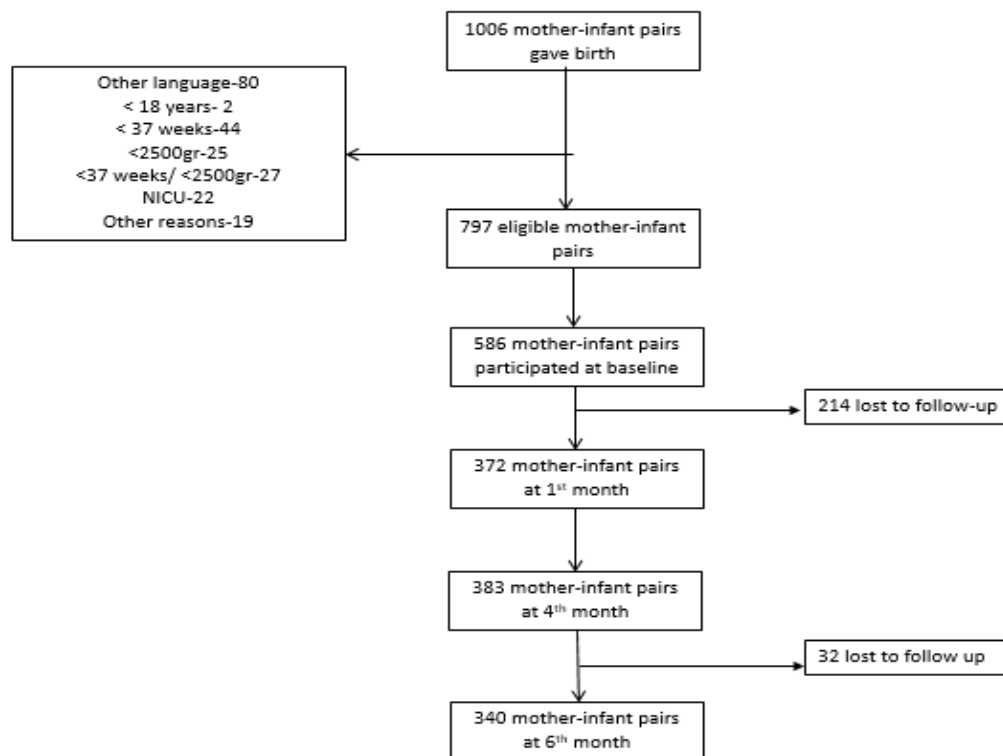


Table 9.2 presents the socio-demographic characteristics of the participants at baseline. Only a small number of participants did not report their socio-demographic characteristics. The percentage of missing values was generally low and ranged between 4-6%, with the exception of family income, for which 15.9% of the participating mothers did not report.

The majority of participants were aged 25-29 years (44.0%) and 30-34 (20%). Only 6.3% of participating mothers were older than 35 years of age. According to official statistics recorded in the Perinatal Health Indicators for the year 2014 report of the Health Monitoring Unit of the Ministry of Health the Perinatal Report (published 2016) the percentage of mothers giving birth in Cyprus during 2014 in the age-category 20-34 was 78.9% and the percentage 35 or older was 18.9%. Hence, it can be deduced that older mothers were slightly more likely to refuse participation in the current study. Therefore, there is some over-representation of younger mothers in the study sample.

The percentage of mothers in the sample who were of Cypriot origin was 71.5%, which is also consistent with the 70% reported in official statistics (Perinatal Health Indicators for the year 2014 report of the Health Monitoring Unit of the Ministry of Health the

Perinatal Report, 2016). In terms of their marital status, the vast majority of mothers in our sample were married or cohabiting (92.7%). The marital status of mothers giving birth in Cyprus is not reported in the official Perinatal Health Indicators report. Nevertheless, this would seem consistent with a related statistic – the percentage of single-parent families in Cyprus, which based on 2011 data is around 7.9%, of which the mother is the head in the vast majority.

In terms of education, 40.6% of mothers in the sample had at most secondary education, while 31.2% and 21.2% had undergraduate and postgraduate tertiary education respectively (52.4% combined). According to official statistics, 67.7% of mothers giving birth in Cypriot maternity clinics had post-secondary education, suggesting a slightly higher rate participation among mothers with secondary education. Only 0.7% of the sample had primary school education (versus 1.5% expected based on official statistics).

With regards to employment, 60.6% reported a full-time status, whereas 22.9% were not employed. Only 12.1% reported a net family income over 3000 euros/ month. Employment status and family income is not reported in official statistics to allow a comparison. More than half (54.6%) delivered their infants with C/S. The observed rate of C/S is consistent with officially published data – 56.9% in 2014 (MoH, 2017). There was, as expected a difference in the proportion of C/S births between the public and private sector -30.9% and 69.1% respectively; $p\text{-value} = 0.001$).

For 47.4% of mothers, this was their first child. Again, this is consistent with the expected statistic of 48.8% reported in the official Perinatal Health Indicators report. Among the rest, 82.9% reported previous breastfeeding experience. Even though the prevalence of exclusive breastfeeding was only 18.8 % at 48 hours, 73.2% of mothers reported their intention to breastfeed exclusively.

Overall, based on the comparison of the observed socio-demographic composition of the sample with officially reported statistics, it can be deduced that the study sample is largely representative of the cohort of mothers giving birth in Cypriot maternity clinics in terms of the main socio-demographic characteristics, parity and mode of birth. There is, nevertheless, some suggestion of slight over-representation of younger mothers and mothers of lower educational attainment in the study sample.

9.2 Participants at follow-up

Table 9.2 also presents the socio-demographic composition of the first-month follow-up sample and a comparison between those who did and didn't participate in the telephone follow-up. There were no significant differences between responders and non-responders in terms of age, marital status, education, employment, parity, BF initiation or mode of birth. Non-Cypriot mothers and mothers in lower income categories appeared slightly more likely to participate in the follow up. Specifically, the proportion of non-Cypriot mothers among those who did and did not participate in the first month follow-up was 23.7% Vs. 19.2% (p-value=0.015). Similarly, the proportion of mothers reporting family income higher than 3000 euro/month was 8.3% Vs. 10.7% (p-value=0.04) among mothers who did and did not participate in the first month follow-up.

Even though no differences were observed in terms of either initiation of BF or intention to exclusively breastfeed, it should be noted that there was a statistically significant difference between responders and non-responders in terms of reported intention to exclusively breastfeed for six months (71% vs 64% respectively; p-value=0.026). This is most likely suggesting that mothers who participated in the follow-up phase might have more positive attitudes towards breastfeeding. If that is the case, then the study is more likely to have overestimated, rather than underestimated the “true” prevalence of breastfeeding and exclusive breastfeeding in the long-term.

However, taken together, the slight over-representation of mothers of non-Cypriot origin follow-up sample might be suggestive of a potential slight over-estimation of the “true” prevalence of breastfeeding (since it was observed that non-Cypriot mothers are more likely to breastfeed longer and breastfeed exclusively). In contrast, the slight under-representation of mothers with higher family income might be suggestive of a potential slight under-estimation of the “true” prevalence of breastfeeding (since it was observed that mothers with higher income are more likely to breastfeed longer and breastfeed exclusively). Nevertheless, no other significant differences were observed with regards to socio-demographic characteristics, which would be clearly suggestive of the actual possible direction of a potential selection bias.

In fact, there was no difference at baseline between mothers who did (mean score 3.44 SD 0.91 on a 5-point scale) and did not participate (mean 3.33 SD 0.88) in the follow-

up phase in terms of perceived breastfeeding self-efficacy. The observed difference (0.11) is neither statistically significant (p -value=0.166) nor it would be considered clinically significant. As mentioned earlier, the clinically significant difference in the maternal breastfeeding self-efficacy scale score expressed on a 1-5 scale is considered to be between 0.35-0.70 (0.5-1.0 SD).

Table 9.2: Socio-demographic characteristics, breastfeeding initiation, intention of exclusive breastfeeding and perceived maternal self-efficacy at (a) baseline and (b) among responders and non-responders

	Baseline		1 st Month		
	N=586	%	Responders (N=372- 63.5%)	Non Responders (N=214- 36.5%)	p-value
Age (years)*					
18-24	145	24.7	91 (24.5)	54 (25.2)	0.938
25-29	258	44.0	164 (44.1)	94 (43.9)	
30-34	117	20.0	72 (19.4)	45 (21.0)	
35-39	28	4.8	18 (4.8)	10 (4.7)	
≥ 40	9	1.5	6 (1.6)	3 (1.4)	
Not stated	29	4.9	21 (5.6)	8 (3.7)	
Education*					
Primary school	4	0.7	2 (0.5)	2 (0.9)	0.136
Secondary school	234	39.9	156 (41.9)	78 (36.4)	
College/ Undergraduate	183	31.2	116 (31.2)	67 (31.3)	
Postgraduate Degree	124	21.2	68 (18.3)	56 (26.2)	
Not stated	41	7.0	30 (8.1)	11 (5.1)	
Marital Status*					
Married/ Cohabiting	543	92.7	340 (91.4)	203 (94.9)	0.163
Single	12	2.0	7 (1.9)	5 (2.3)	
Divorced/ Separated	2	0.3	1 (0.3)	1 (0.5)	
Not stated	29	4.9	24 (6.5)	5 (2.3)	
Employment Status*					
Full Time	355	60.6	217 (58.3)	138 (64.5)	0.109
Part Time	65	11.1	38 (10.2)	27 (12.6)	
Unemployed	134	22.9	92 (24.7)	42 (19.6)	
Not stated	32	5.5	25 (6.7)	7 (3.3)	
Monthly Family Net Income*					
<= €1500	230	39.2	158 (42.5)	72 (33.6)	0.040
€1501- €3000	192	32.8	107 (28.8)	85 (39.7)	
€3001- €4500	54	9.2	31 (8.3)	23 (10.7)	
> €4501	17	2.9	12 (3.2)	5 (2.3)	

	<i>Baseline</i>		<i>1st Month</i>		<i>p-value</i>
	<i>N=586</i>	<i>%</i>	<i>Responders</i> <i>(N=372- 63.5%)</i>	<i>Non Responders</i> <i>(N=214- 36.5%)</i>	
Not stated	93	15.9	64 (17.2)	29 (13.6)	
Country of Origin*					
Cypriot	419	71.5	253 (68.0)	166 (77.6)	0.015
Not Cypriot	129	22.0	88 (23.7)	41 (19.2)	
Not stated	38	6.5	31 (8.3)	7 (3.3)	
Type Of Birth*					
Vaginal	249	42.5	162 (43.5)	87 (40.7)	0.608
Caesarian section	320	54.6	198 (53.2)	122 (57.0)	
Not stated	17	2.9	12 (3.2)	5 (2.3)	
Parity*					
Primiparous	278	47.4	170 (45.7)	108 (50.5)	0.519
Multiparous	292	49.8	191 (51.3)	101 (47.2)	
Not stated	16	2.7	11 (3.0)	5 (2.3)	
Previous BF experience *‡					
Yes	244	83.6	158 (82.7)	86 (85.1)	0.009
No	44	15.1	33 (17.3)	11 (10.9)	
Not stated	4	1.4	0 (0.0)	4 (4.0)	
BF during the first 48 hours*					
Yes	494	84.3	314 (84.4)	180 (84.1)	0.758
No	55	9.4	33 (8.9)	22 (10.3)	
Not stated	37	6.3	27 (7.3)	12 (5.6)	
Intention for EBF*					
Yes	429	73.2	276 (74.2)	153 (71.5)	0.337
No	123	21.0	72 (19.4)	51 (23.8)	
Not stated	34	5.8	24 (6.5)	10 (4.7)	
Intention for EBF during the first six months*					
Yes	401	68.4	264 (71.0)	137 (64.0)	0.062
No	146	24.9	81 (21.8)	65 (30.4)	
Not stated	39	6.7	27 (7.3)	12 (5.6)	
Perceived Breastfeeding Maternal Self-Efficacy at 48 hours †					
N	504	86.0	321	183	
Mean (SD)	3.40 (0.90)		3.44 (0.91)	3.33 (0.88)	0.166

*p-value of Chi-square was used for categorical variables; †p-value of Independent t-test was used for continuous variables; ‡ Only multiparous participants included in the analysis

9.3 Participant characteristics by private and public sector

Table 9.3 presents the socio-demographic characteristic of participating mothers that gave birth at the public and private sector. As seen on **Table 9.3**, differences on the socio-demographic profile of mothers that gave birth at the private and the public sector are evident. For instance, while more than half of the mothers (59.6%) that gave birth at the private sector reported of having undergraduate and postgraduate education, mothers at the public sector did not exceed 39.7% ($p < 0.001$). This difference is also apparent in relation with other indicators of social maternal position. The majority of mothers in the private sector had full employment status (68.2%) in comparison with 48.3% of the mothers in the public sector reported of being fully employee. In relation with family income, more than half of the mothers (57.5%) in the public sector reported of a monthly family net income $> \text{€}1500$, while in the private sector only 28.9% receiving the corresponding family income. Finally, 39.1% of the mothers that selected the public sector were unemployed in comparison with 14.2% in the private sector. One in three mothers that gave birth in the public sector were of non Cypriot origin, about two times higher than those in the private sector (32.5% vs 16.0%; $p\text{-value} < 0.001$). Significant differences between the public and the private sector were observed in relation with mode of birth. Ceasarean section was found to be significantly higher in the private sector with 59.1% vs 46.7% in the public sector. One out of two mothers (52.4%) in the public sector delivered vaginally while only 36.9% of the mothers in the private sector gave birth with vaginal delivery ($p = 0.001$). In relation with parity, more half of the mothers (59%) in the public sector were multiparous, while one in two primiparous mothers showed preference to the private sector' maternity services ($p = 0.001$).

9.4 Summary of main findings

In general, the study sample appears largely representative of the birth cohort across Cypriot maternity clinics in terms of the main socio-demographic characteristics, clinical characteristics (e.g. C/S versus vaginal births) and the expected distribution of births across the districts. Similarly, no significant differences were observed between responders and non-responders at follow up. Striking differences were observed in terms of the socio-demographic profile between women who gave birth in the public compared to the private sector. Younger, single mothers, women with lower family

income and lower educational attainment were more likely to give birth at the public sector. Mothers at the private sector, on the other hand, were more likely to be Cypriot, primiparas, with higher income and higher educational attainment. Finally, as expected C/S was significantly higher in the private sector than in the public sector.

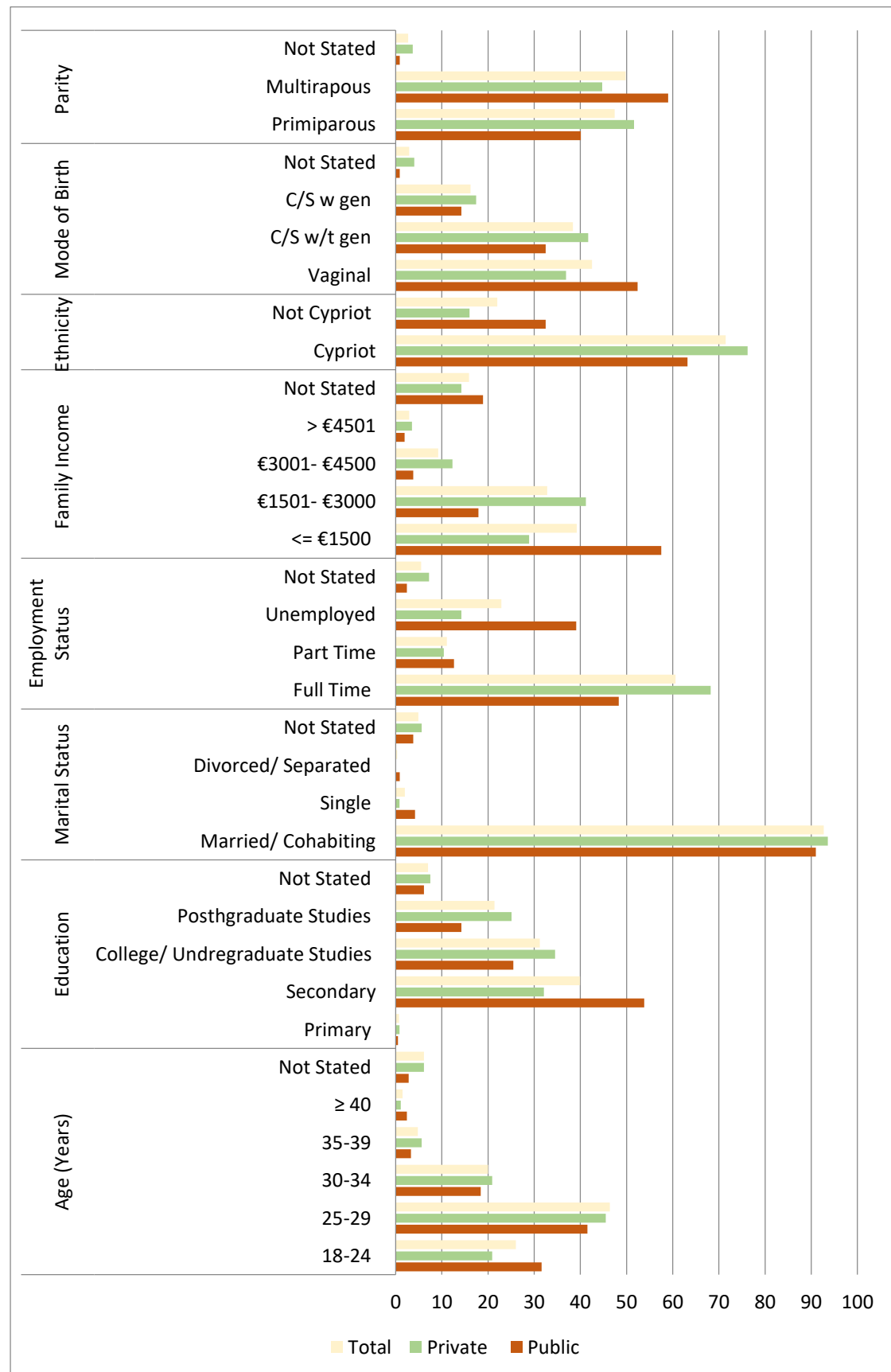
Table 9.3: *Comparison of socio-Demographic Characteristics of the participants that gave birth (a) at the private and public sector and (b) overall*

	<i>Public Sector</i>	<i>Private Sector</i>	
	N (%)	N (%)	p-value*
Age (Years)			
18-24	67 (31.6)	78 (20.9)	0.022
25-29	88 (41.5)	170 (45.5)	
30-34	39 (18.4)	78 (20.9)	
35-39	7 (3.3)	21 (5.6)	
≥ 40	5 (2.4)	4 (1.1)	
Not stated	6 (2.8)	23 (6.1)	
Education			
Primary	1 (0.5)	3 (0.8)	<0.001
Secondary	114 (53.8)	120 (32.1)	
College/ Undregraduate Studies	54 (25.5)	129 (34.5)	
Postgraduate Studies	30 (14.2)	94 (25.1)	
Not Stated	13 (6.1)	28 (7.5)	
Marital Status			
Married/ Cohabiting	193 (91.0)	350 (93.6)	0.006
Single	9 (4.2)	3 (0.8)	
Divorced/ Separated	2 (0.9)	0 (0.0)	
Not stated	8 (3.8)	21 (5.6)	
Employment Status			
Full Time	100 (48.3)	255 (68.2)	<0.001
Part Time	26 (12.6)	39 (10.4)	
Unemployed	81 (39.1)	53 (14.2)	
Not stated	5 (2.4)	27 (7.2)	
Net Family Monthly Income			
≤ €1500	122 (57.5)	108 (28.9)	<0.001
€1501- €3000	38 (17.9)	154 (41.2)	
€3001- €4500	8 (3.8)	46 (12.3)	
> €4501	4 (1.9)	13 (3.5)	

	<i>Public Sector</i>	<i>Private Sector</i>	
Not Stated	40 (18.9)	53 (14.2)	
Country of Origin			
Cypriot	134 (63.2)	285 (76.2)	<0.001
Non Cypriot	69 (32.5)	60 (16.0)	
Not Stated	9 (4.2)	29 (7.8)	
Type of Birth			
Vaginal	111 (52.4)	138 (36.9)	0.001
C/S w/t gen anesthesia	69 (32.5)	156 (41.7)	
C/S w gen anesthesia	30 (14.2)	65 (17.4)	
Not Stated	2 (0.9)	15 (4.0)	
Parity			
Primiparous	85 (40.1)	193 (51.6)	0.001
Multirapous	125 (59.0)	167 (44.7)	
Not Stated	2 (0.9)	14 (3.7)	
Intention to EBF			
Yes	162 (76.4)	267 (71.4)	0.319
No	41 (19.3)	82 (21.9)	
Not stated	9 (4.2)	25 (6.7)	

*p-value of Chi-square was used for categorical variables

Figure 9.2: Socio-Demographic Characteristics of the participants that gave birth at the private and public sector and overall



Chapter 10:

Prevalence of Breastfeeding and Exclusive Breastfeeding

Chapter 10 focuses the findings from the estimation of the prevalence of BF and EBF beyond 48 hours and up to the sixth month in Cyprus using the self-reported method as well as the 24-recall (**Section 10.1**). It further presents the distribution of BF and EBF rates within the first six months by sector and district (**Section 10.2**) as well as in relation with the socio-demographic characteristics of the sample (**Section 10.3**), followed by the investigation of the association of the socio-demographic characteristics with BF initiation, continuation and exclusivity(**Section 10.4**). The chapter concludes with the presentation of the main reasons of perceived BF discontinuation the distribution on the basis of their importance (**Section 10.5**).

10.1 Prevalence of BF and EBF at baseline and up to six months

10.1.1 Self-reported method

Table 10.1 shows the prevalence of BF and EBF among study participants at baseline and up to the sixth month of the infants' life. Initiation of BF while at the maternity clinic (24-48 hours) was estimated at 84.3%. Nevertheless, only 18.8% (95% CI 15.6%-21.9%) of mothers amongst the full sample exclusively breastfed while at the clinic.

At the first month post-partum, there was not much change since the prevalence of BF and EBF was 73.9% (95% CI 69.4-78.3) and 17.3% (95% CI 13.4-21.1) respectively among mothers who participated in the follow-up. Nevertheless, it should be noted that this might represent a slight overestimation of the 'true' prevalence, given that mothers with a more positive attitude towards breastfeeding might have been more likely to participate at the follow-up, as reported in the previous chapter.

By the sixth month, the prevalence of BF was estimated at 32.4% (95% CI 27.7-37.2), with the sharpest decline observed between the first and fourth month. With respect to EBF, a more gradual reduction was observed up to the sixth month when only 5% of mothers were exclusively breastfeeding (*also see Figure 10.1*).

24- hour recall method

The prevalence of BF based on the method of recording a 24-hour recall of feeding practices was similar, if not slightly lower, than the respective estimates based on self-reported status. For example, the prevalence of BF at the fourth month was estimated at 44.0% based on reported BF status and at 39.6% based on whether mothers breastfed their baby in the 24 hour period prior to the interview. With respect to EBF, a slightly larger difference was observed depending on the method of assessment. For example at fourth month, the proportion of mothers who exclusively breastfed was estimated at 12.3% based on self-reported status, and slightly higher at 19.8% based on the prior 24 hours. This observation could be attributed to the fact that during the weaning phase, mothers may have already introduced other liquids in the child's diet, but exclusively breastfed the day prior to the interview.

In contrast, at the sixth month, only 0.3% exclusively breastfed in the 24 hours prior to the interview versus 5% based on reported status. This is more likely to be a design effect since the self-reported month of breastfeeding cessation and of liquid/solid introduction in infant feeding was also taken into account to determine EBF or BF status at the fourth and sixth month. For example, at this critical period if a mother was interviewed a few days past the sixth month and reported liquid or solid introduction at the sixth month and no sooner, she was then considered to be breastfeeding exclusively up to the sixth month.

Table 10.1: *Prevalence of Breastfeeding (BF) and Exclusive Breastfeeding (EBF) in Cyprus at 48 hours, 1st, 4th and 6th month*

	<i>N</i>	<i>EBF</i> <i>N(%)</i>	<i>95% CI</i> ‡	<i>N</i>	<i>BF</i> <i>N (%)</i>	<i>95% CI</i> ‡
Self-Reported Status						
48 hours	586	110 (18.8)	15.6-21.9	586	494 (84.3)	81.4-87.3
1 st Month*	371	64 (17.3)	13.4-21.1	371	274 (73.9)	69.4-78.3
4 th Month*†	415	51 (12.3)	9.1-15.5	393	169 (44.0)	38.1-47.9
6 th Month*†	417	21 (5.0)	3.1-7.6	376	122 (32.4)	27.7-37.2
24 hour recall§						
4 th month	369	73 (19.8)	15.7-23.9	369	146 (39.6)	34.6-44.6
6 th month	341	1 (0.3)	0.007-1.6	341	112 (32.8)	27.9- 37.8

*Sample size based on number of participants at that time point; †Sample size at 4th and 6th month based on the information given on EBF/ BF status at that time point as well as on the assumption that mothers who reported discontinuing EBF/ BF at 1st month or 4th month and lost to follow up, would not initiate BF or EBF again The observed differences on the denominators for EBF and BF at 4th and 6th month are due to the fact that information given by mothers on the introduction of liquids and /or solids is used to indicate their EBF status. Once mothers were lost to follow up, detailed information on their BF status was not available. Thus, while it might not be known whether some continue to breastfeed, it could be safely assumed that they ate not exclusively breastfeeding at that point in time based on information about their EBF status at the previous conduct. § For the purposes of comparison between the two methods of estimation, the last two rows present BF and EBF estimates for the fourth and sixth month based on 24hr recall.

10.2 Prevalence of BF and EBF by Sector and District

10.2.1 BF and EBF by Sector

While prevalence of EBF during the first 48 hours was significantly higher in the public rather than in the private sector (23.6% Vs 16.0%; p-value=0.025), this difference was no longer apparent at the first month. By the fourth month, a non-significant difference was observed in favor of the public sector which nevertheless remained apparent up to the sixth month.

In contrast, initiation of BF was comparable between the public and the private sector and remained similar up to the first month. Nonetheless, it appears that a higher proportion of mothers who gave birth at the public sector continued BF at the fourth (47.8% vs 39.8%; p-value=0.119) and the sixth month (40.3% vs 27.3%; p-value=0.009).

Table 10.2: Prevalence of BF and EBF in the Public and Private Sector

Exclusive Breastfeeding				
	48hours	1 st Month	4 th Month	6 th Month
	N (%)‡	N (%)‡	N (%)‡	N (%)‡
Public	50 (23.6)	27 (17.4)	23 (13.9)	10 (6.1)
Private	60 (16.0)	37 (17.1)	28 (11.2)	11 (4.4)
p-value ¥	0.025	0.942	0.405	0.439
Breastfeeding				
	48hours	1 st Month	4 th Month	6 th Month
	N (%)‡	N (%)‡	N (%)	N (%)‡
Public	169 (84.0)	115 (74.2)	75 (47.8)	60 (40.3)
Private	316 (84.5)	159 (73.6)	94 (39.8)	62 (27.3)
p-value ¥	0.866	0.900	0.119	0.009

Total number of mothers who gave birth at the public and private sector: 212 and 374 respectively; ‡Values expressed as percentages; ¥ p-value of chi-square test of independence

10.2.2 BF and EBF by District

Table 10.3 presents the prevalence of BF and EBF across the five districts on the island. At district level, the prevalence of BF initiation varied significantly with the highest rates observed in Ammochostos with 91.1% and the lowest with 71.7% in Paphos (p -value=0.002). These differences were also apparent at first month with the highest prevalence of BF observed in Nicosia with 82.2%, while Paphos persisted to be last in of the rank with only 60.4% of mothers breastfeeding at the first month. By the fourth month, there was a convergence in these differences. By the sixth month, the highest reduction was observed in Ammochostos, even though this was the district with the highest initiation of breastfeeding. The prevalence of mothers in Ammochostos breastfeeding at the sixth month was 17.1%, down from 36.1% at fourth month. The highest prevalence of BF at the sixth month (and the smallest reduction) were observed in Nicosia and Limassol, where almost 40% of the participating mothers continued to breastfeed.

Similarly, the prevalence of EBF initiation was highest in Ammochostos (33.3%), while the lowest prevalence of EBF was reported in Larnaca and Paphos, where it was more than 5-times less likely for a mother to initiate exclusive breastfeeding. Specifically, only 6.3% and 6.7% of mothers exclusively breastfeeding while at the clinic in these two districts respectively. In Nicosia and Limassol, the prevalence of EBF was 19.5% and 26.2%.

Interestingly, the prevalence of exclusive breastfeeding at the first month was highest in Nicosia, and not in Limassol which was the district with the highest prevalence of exclusive breastfeeding initiation. In fact, in Nicosia, an increase in the prevalence of exclusive breastfeeding was observed from 19.5% within the first 48 hours to 25.4% at the first month. However, it is not entirely clear whether this apparent increase can be attributed to a number of mothers who breastfed exclusively after discharge, but their infants were given other liquids while mother was at the clinic. It is also, if not even more likely, to be the result of differential attrition between baseline and follow-up between mothers who did and did not exclusively breastfed at baseline. If so, this is another indication that the prevalence of breastfeeding and exclusive breastfeeding observed in this study are more likely to represent an over (rather than an under) representation of the “true” prevalence.

The prevalence of EBF in Nicosia appeared to be higher, followed closely by Limassol, than all other districts up to the fourth month (2-3 times higher compared to Larnaca and as much as 5-10 times higher compared to Paphos). Nevertheless, by the sixth month, the prevalence of EBF shows a sharpest decline in Nicosia compared to Limassol or even compared to other districts, with the exception of Paphos where the prevalence of EBF. It is reduced to 3.9% and is therefore similar to the prevalence of EBF observed in Ammochostos and Larnaca. The prevalence of EBF in Paphos was consistently low throughout the period. Only 6.7% of mothers exclusively breastfed even at the first 48 hour. This corresponds to about 1 in 20 mothers compared to 1 in 5 mothers observed nationally. By the sixth month, none of the participating mothers in Paphos were exclusively breastfeeding.

At the sixth month, the highest prevalence of EBF by a factor of two is observed in the Limassol district, where 1 in 10 mothers are still exclusively breastfeeding, compared to less than 1 in 20 mothers elsewhere on the island.

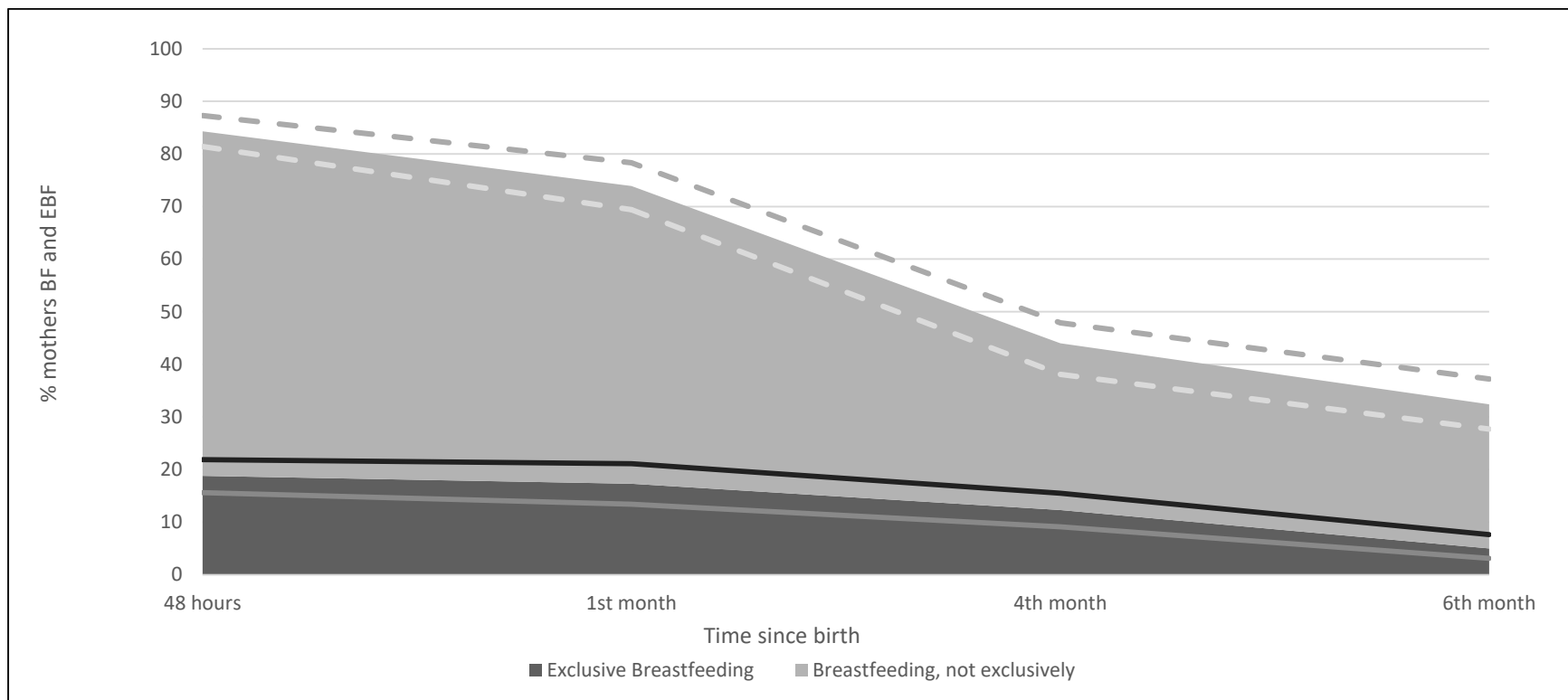
Table 10.3: Prevalence of EBF and BF by district during 48 hours and up to the 6th month

	48 hours			1 st Month			4 th Month			6 th Month		
	<i>N</i>	<i>EBF</i> [¥]	<i>BF</i> [§]	<i>N</i>	<i>EBF</i> [¥]	<i>BF</i> [§]	<i>N</i>	<i>EBF</i> [¥]	<i>BF</i> [§]	<i>N</i>	<i>EBF</i> [¥]	<i>BF</i> [§]
		<i>n (%)</i> [‡]	<i>n (%)</i> [‡]		<i>n (%)</i> [‡]	<i>N (%)</i> [‡]		<i>n (%)</i> [‡]	<i>n (%)</i> [‡]		<i>n (%)</i> [‡]	<i>n (%)</i> [‡]
<i>Nicosia</i>	241	47 (19.5)	213 (88.4)	118	30 (25.4)	97 (82.2)	145	26 (17.2)	71 (48.0)	132	6 (3.9)	57 (39.9)
<i>Limassol</i>	145	38 (26.2)	125 (86.2)	92	21 (22.8)	68 (73.9)	88	16 (16.7)	43 (47.3)	75	10 (10.5)	33 (39.8)
<i>Larnaca</i>	95	6 (6.3)	72 (75.8)	73	8 (11.0)	51 (69.9)	70	4 (5.3)	27 (37.0)	61	4 (5.3)	14 (20.6)
<i>Paphos</i>	60	4 (6.7)	43 (71.7)	49	1 (2.1)	29 (60.4)	45	2 (3.8)	15 (32.6)	42	0 (0.0)	12 (25.5)
<i>Ammochostos</i>	45	15 (33.3)	41 (91.1)	40	4 (10.0)	29 (72.5)	35	3 (7.3)	13 (36.1)	30	1 (2.4)	6 (17.1)
<i>p-value</i> [¥]		<0.001	0.002		0.001	0.052		0.012	0.189		0.044	0.005

[¥] Number of participants that EBF during the first 48 hours; at 1st, 4th and 6th month: N= 110, 64, 51 and 21 respectively [§] Number of participants that BF during the first 48 hours; at 1st, 4th and 6th month: 494, 274 169 and 122 respectively; [‡] Values expressed as percentages; [¥] p-values of chi-square test of independence.

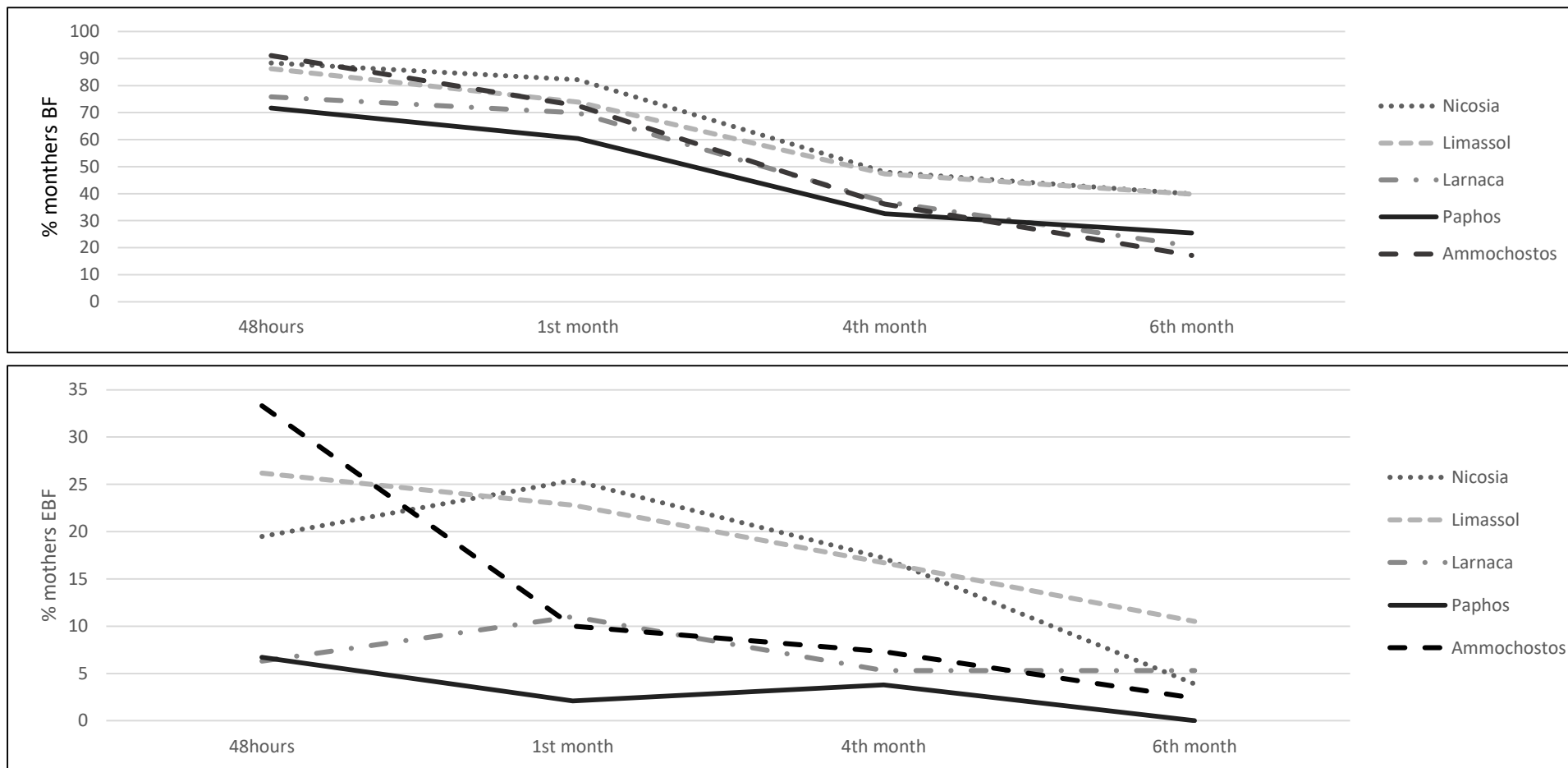
Figure 10.1: *Prevalence of Breastfeeding (BF) and Exclusive Breastfeeding (EBF) for the first six months (a) nationwide, (b) by district and (c) by sector*

(a) Nationwide

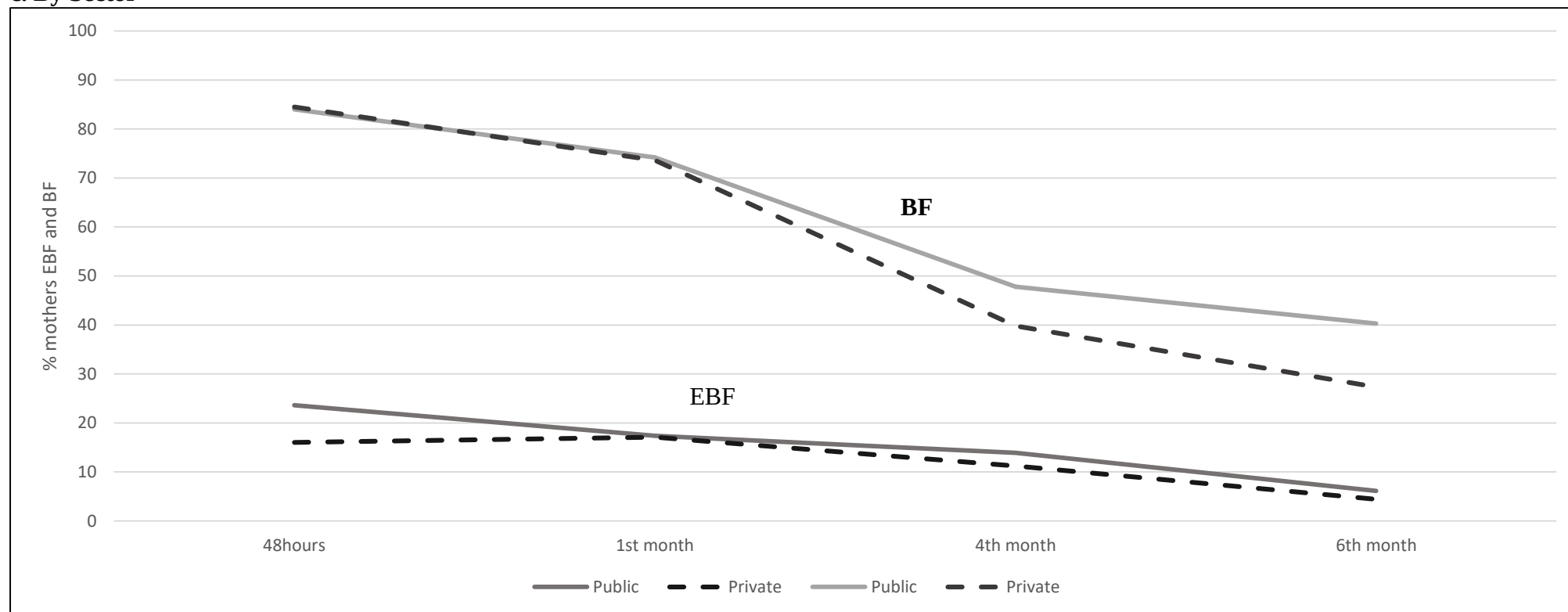


Note: The dotted and solid lines on the first graph showing the nationwide prevalence of BF and EBF represent the 95% confidence intervals for the BF and EBF prevalence estimates respectively

b. By District



c. By Sector



10.3 Differences of BF and EBF by Socio-Demographic Characteristics

Table 10.4 and **Table 10.5** presents the prevalence of BF and EBF respectively according to socio-demographic and other characteristics of the participants. There was no significant difference in the prevalence of BF initiation or EBF at 48 hours by age, marital status, or nationality. In fact, no difference was generally observed according to these variables during the whole period of follow-up.

In contrast, there was evidence of a social gradient in favor of mothers of higher socioeconomic position. Mothers with higher educational attainment or with higher family income were more likely to BF at 48 hours, even though they were not necessarily more likely to breastfeed exclusively. Moreover, they were more likely to still breastfeed at the first and fourth month. For instance, the prevalence of breastfeeding at the fourth month displayed a clear stepwise increase across increasing categories of income (i.e. 39.0%, 46.2%, 71.4%; p -value for trend<0.001).

While not statistically significant, a similar stepwise pattern was observed in terms of exclusive breastfeeding whereby twice as many mothers in high-income families were exclusive breastfeeding at the fourth month compared to mothers in the lower income category (19.2% vs 10.0%; p -value for trend=0.137). A similar pattern was observed in terms of educational attainment. In fact, in terms of EBF, the patterning by education, favoring mothers with higher educational attainment, appeared consistent throughout the period, with statistical significant differences observed at the first (marginally), fourth and sixth month. Specifically, at the first month, the prevalence of EBF was 13.3%, 17.2% and 23.5% (p -value for trend=0.06) across mothers with primary/secondary, college or University tertiary education and postgraduate education respectively. At the fourth month, these figures were 8.6%, 12.0% and 20.2% (p -value for trend<0.01) while at the sixth month, they were 2.9%, 4.0% and 10.7% (p -value for trend=0.01).

As also depicted on **Figure 10.2**, while the prevalence of EBF initiation appears similar across different levels of educational attainment, in the long term there appears to be a progressive widening of the ‘gap’. Mother with a postgraduate education were 1.8-

times (1st month), 2.3-times (4th month) and 3.7-times (6th month) more likely to be exclusively breastfeeding compared to mothers with primary or secondary education.

In terms of mode of delivery, while no difference was observed in terms of BF initiation, EBF was almost three times higher among mothers who gave birth vaginally (32.0% vs 10.8% and 7.4% among mothers who gave birth by C/S without and with general anesthesia respectively; $p\text{-value}<0.001$). Even though the prevalence of exclusive breastfeeding was the difference in exclusive breastfeeding by mode of birth was observed across all time-points, and was still apparent at the 6th month even though it was no longer statistically significant. Specifically, at the first month, 21.% of mothers who gave birth vaginally were breastfeeding exclusively compared to 17.2% and only 4.3% among mothers who gave birth by C/S without and with general anesthesia respectively (p for trend <0.01). Similarly, these figures were 16.6%, 11.0% and 1.4% at the fourth month (p for trend <0.01) and 6.1%, 4.8% and 1.3% at the sixth month (p for trend=0.11).

It is of note, however, that the largest difference was observed between women who gave birth by C/S with the use of general anesthesia. Women who gave birth by C/S without general anesthesia were less likely to be exclusively breastfeeding in the long-term but the difference compared to women who gave birth vaginally was not as pronounced. .

Similarly, while the likelihood to breastfeed did not appear to differ according to whether this was the woman's first child, the likelihood to breastfeed exclusively was at least twice higher in multiparous compared to primiparous mothers. In fact, the prevalence of EBF at 48 hours among primiparas (11.6%) appeared lower even compared to mother who have had other children, but reported no previous experience of BF (15.9%). The difference between primiparous and multiparous mothers remain apparent, and statistically significant at first (23.1% vs 10.1%, $p\text{-value}=0.001$) and fourth (16.6% vs 7.4%; $p\text{-value}=0.005$) month, but not the 6th month.

The prevalence of BF and EBF by socio-demographic characteristics across the fourth time-points examined in this study are also presented graphically in *Figure 2*, in order to allow a visual depiction of the trajectory across different groups of women.

In general, the prevalence of breastfeeding and exclusive breastfeeding seem to converge by the sixth month, and observed differences are no longer apparent or at least

not statistically significant, with the exception of mode of birth (favouring women who gave birth vaginally) and income (favouring women at higher family income categories) only for breastfeeding, and with the exception of educational attainment (favouring women of higher educational attainment) for both breastfeeding as well as exclusive breastfeeding.

Table 10.4: Baseline Characteristics of Participants according to their BF Status at 48 hours, 1st and 4th month

BF									
			48 hours		1 st Month		4 th Month		6 th Month
	N	n	% (n)	n	%(n)	n	% (n)	n	% (n)
Age (years)									
18-24	145	141	89.4 (126)	91	65.9 (60)	95	35.8 (34)	89	30.3 (27)
25-29	258	251	89.6 (225)	164	73.8 (121)	175	45.1 (79)	167	32.9 (55)
30-34	117	117	92.3 (108)	72	81.9 (59)	76	44.7 (34)	76	34.2 (26)
>= 35	37	35	88.6 (31)	24	79.2 (19)	28	57.1 (16)	28	39.3 (11)
p-value			0.832 (0.666)		0.125 (0.027)		0.199 (0.056)		0.841 (0.382)
(p for trend) †									
Education									
Primary/ Secondary	238	231	87.4 (202)	158	67.7 (107)	165	35.8 (59)	158	27.8 (44)
College/ Undergraduate	183	181	90.1 (163)	116	75.9 (88)	119	40.3 (48)	114	26.3 (30)
Postgraduate	124	123	95.1 (117)	68	82.4 (56)	82	61.0 (50)	80	48.8 (39)
p-value			0.071 (0.024)		0.056 (0.017)		0.001 (<0.001)		0.001 (0.004)
(p for trend) †									
Marital Status									
Married/ Cohabiting	543	531	89.8 (477)	340	73.5 (250)	363	43.3 (157)	349	32.4 (113)
Single/ Divorced/ Separated	14	14	92.9 (13)	8	100.0 (8)	8	50.0 (4)	8	50.0 (4)
p-value†			0.711		0.091		0.703		0.294

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BF									
	<i>N</i>	<i>n</i>	<i>48 hours</i> % (<i>n</i>)	<i>n</i>	<i>1st Month</i> %(<i>n</i>)	<i>n</i>	<i>4th Month</i> % (<i>n</i>)	<i>n</i>	<i>6th Month</i> % (<i>n</i>)
Employment Status									
Full Time	355	348	91.7 (319)	217	75.1 (163)	238	45.8 (109)	232	34.5 (80)
Part Time	65	63	92.1 (58)	38	89.5 (34)	37	48.6 (18)	35	28.6 (10)
Unemployed	134	130	83.8 (109)	92	64.1 (59)	96	35.4 (34)	90	31.1 (28)
p-value			0.035 (0.018)		0.009 (0.100)		0.177 (0.107)		0.710 (0.509)
(p for trend) †									
Monthly Family Net Income									
<= €1500	230	225	88.4 (199)	158	71.5 (113)	164	39.0 (64)	160	31.2 (50)
€1501- €3000	192	189	93.1 (176)	107	79.4 (85)	119	46.2 (55)	114	32.5 (37)
>= €3001	71	70	97.1 (68)	43	90.7 (39)	49	71.4 (35)	47	51.1 (24)
p-value			0.044 (0.013)		0.023 (0.006)		<0.001 (<0.001)		0.036 (0.034)
(p for trend) †									
Country of Origin									
Non Cypriot	129	123	89.4 (110)	88	70 (79.5)	84	40 (47.6)	76	35.5 (27)
Cypriot	419	412	90.8 (374)	253	184 (72.7)	282	121 (42.9)	276	32.6 (90)
p-value†			0.656		0.206		0.445		0.633
Type of Birth									
C/S with general anesthesia	95	86	77.9 (67)	70	64.3 (45)	72	27.8 (20)	72	22.2 (16)

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BF									
	<i>N</i>	<i>n</i>	48 hours		1st Month		4th Month		6th Month
			% (n)	n	%(n)	n	% (n)	n	% (n)
C/S without general anesthesia	225	220	88.2 (194)	128	70.3(90)	139	36.7 (51)	133	26.3 (35)
Vaginal	249	242	95.9 (232)	162	80.2 (130)	169	54.4 (92)	160	41.9 (67)
p-value			<0.001 (<0.001)		0.023 (0.007)		<0.001 (<0.001)		0.006 (0.135)
(p for trend) †									
Parity and Previous Experience on BF									
First child	294	265	92.1 (244)	180	72.8 (131)	195	36.4 (71)	185	27.6 (51)
2+ children w/t previous experience	44	44	61.4 (27)	33	27.3 (9)	34	11.8 (4)	157	42.7 (67)
2+ children w previous experience	244	237	93.2 (221)	158	84.8 (134)	164	57.3 (94)	34	11.8 (4)
p-value			<0.001 (<0.001)		<0.001 (0.014)		<0.001 (0.724)		<0.001 (0.735)
(p for trend) †									

Number of mothers that reported Breastfeeding at 48 hours, 1st and 4th month: N= 494, 274, 169 and 122 respectively; † p-value of chi-square was used for categorical variables

Table 10.5: Baseline Characteristics of Participants according to their EBF Status at 48 hours, 1st and 4th month

EBF									
	<i>N</i>	<i>n</i>	<i>48 hours</i>		<i>1st Month</i>		<i>4th Month</i>		<i>6th Month</i>
			% (<i>n</i>)	<i>n</i>	%(<i>n</i>)	<i>n</i>	% (<i>n</i>)	<i>n</i>	% (<i>n</i>)
Age (years)									
18-24	145	145	16.6 (24)	91	7.7 (7)	100	9.0 (9)	102	6.9 (7)
25-29	258	255	18.4 (47)	164	17.7 (29)	182	13.2 (24)	181	4.4 (8)
30-34	117	116	27.6 (32)	72	26.4 (19)	81	11.1 (9)	81	3.7 (3)
>= 35	37	36	13.9 (5)	24	16.7 (4)	29	20.7 (6)	29	3.4 (1)
p-value			0.084 (0.228)		0.017 (0.012)		0.369 (0.199)		0.762 (0.836)
(p for trend) †									
Education									
Primary/ Secondary	238	236	18.6 (44)	158	13.3 (21)	175	8.6 (15)	172	2.9 (5)
College/ Undergraduate	183	182	19.8 (36)	116	17.2 (20)	125	12.0 (15)	126	4.0 (5)
Postgraduate	124	122	20.5 (25)	68	23.5 (16)	84	20.2 (17)	84	10.7 (9)
p-value			0.907 (0.662)		0.163 (0.060)		0.027 (0.009)		0.020 (0.011)
(p for trend) †									
Marital Status									
Married/ Cohabiting	543	538	19.5 (105)	340	16.8 (57)	380	12.4 (47)	381	4.7 (18)
Single/ Divorced/ Separated	14	14	14.3 (2)	8	25.0 (2)	9	11.1 (1)	9	11.1 (1)
p-value†			0.625		0.539		0.910		0.379

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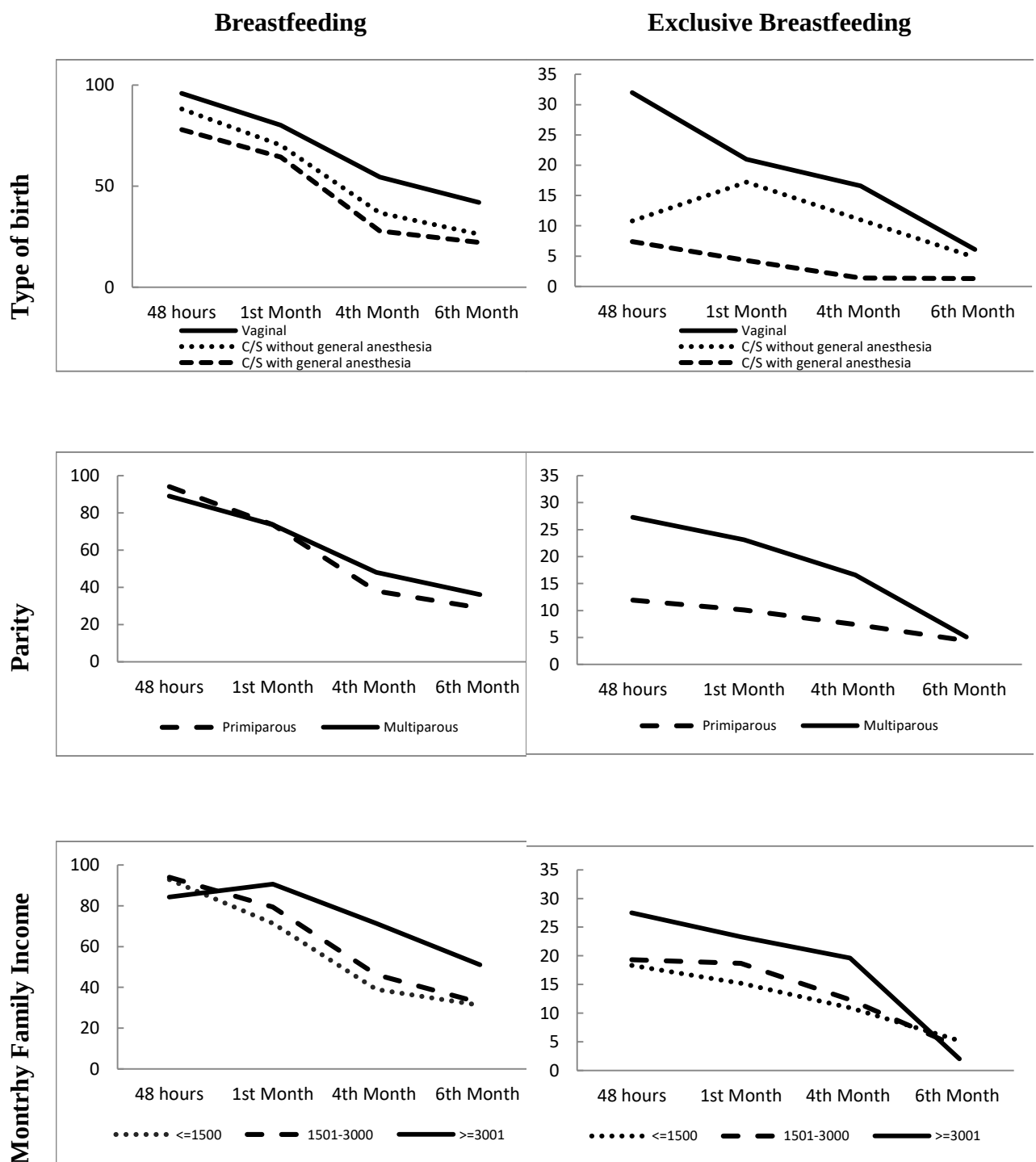
Employment Status									
Full Time	355	354	20.1 (71)	217	17.1 (37)	248	10.5 (26)	250	3.2 (8)
Part Time	65	64	23.4 (15)	38	18.4 (7)	40	15.0 (6)	39	7.7 (3)
Unemployed	134	131	16.0 (21)	92	15.2 (14)	100	15.0 (15)	100	8.0 (8)
p-value			0.426 (0.406)		0.885 (0.729)		0.424 (0.214)		0.118 (0.047)
(p for trend) †									
Monthly Family Net Income									
<= €1500	230	229	18.3 (42)	158	15.2 (24)	175	10.9 (19)	174	5.2 (9)
€1501- €3000	192	192	19.3 (37)	107	18.7 (20)	122	12.3 (15)	124	4.0 (5)
>= €3001	71	69	27.5 (19)	43	23.3 (10)	51	19.6 (10)	51	2.0 (1)
p-value			0.234 (0.152)		0.433 (0.198)		0.252 (0.137)		0.600 (0.322)
(p for trend) †									
Country of Origin									
Non Cypriot	129	126	27 (21.4)	88	16 (18.2)	92	13 (14.1)	89	4.5 (4)
Cypriot	419	417	80 (19.2)	253	43 (17.0)	290	35 (12.1)	294	5.1 (15)
p-value†			0.579		0.800		0.603		0.817
Type of Birth									
C/S with general anesthesia	95	94	7.4 (7)	70	4.3 (3)	74	1.4 (1)	75	1.3 (1)
C/S without general anesthesia	225	223	10.8 (24)	128	17.2 (22)	145	11.0 (16)	147	4.8 (7)
Vaginal	249	247	32.0 (79)	162	21.0 (34)	181	16.6 (30)	179	6.1 (11)
p-value			<0.001 (<0.001)		0.007 (0.003)		0.003 (0.001)		0.258 (0.114)

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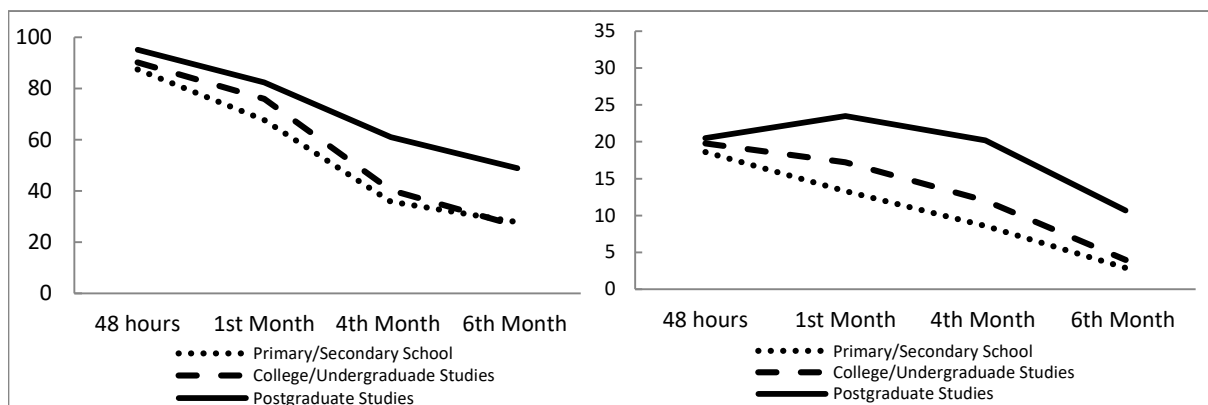
(p for trend) †									
Parity and Previous Experience on BF									
First child	294	275	11.6 (32)	180	11.7 (21)	206	8.3 (17)	210	5.2 (11)
2+ children w/t previous experience	44	44	15.9 (7)	33	3.0 (1)	35	5.7 (2)	172	5.8 (10)
2+ children w previous experience	244	241	29.5 (71)	158	26.6 (42)	174	18.4 (32)	35	0 (0.0)
p-value			<0.001 (0.001)		<0.001 (0.255)		0.005 (0.161)		0.351 (0.446)
(p for trend) †									

Number of mothers that reported Exclusive Breastfeeding at 48 hours, 1st and 4th month: N= 110, 64 and 51 respectively; † p-value of chi-square was used for categorical variables

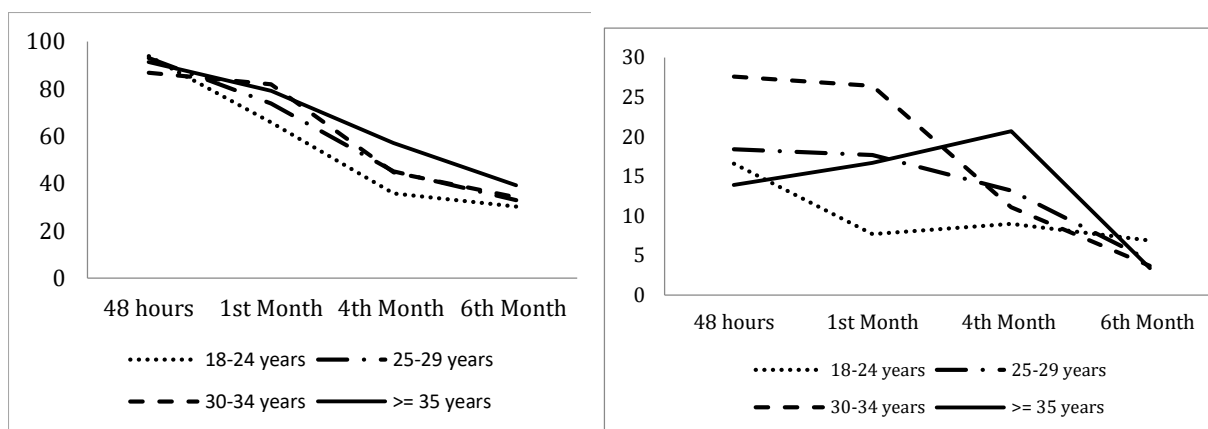
Figure 10.2: Graphical representation of the prevalence of (a) breastfeeding and (b) exclusive breastfeeding up to the sixth month by socio-demographic characteristic.



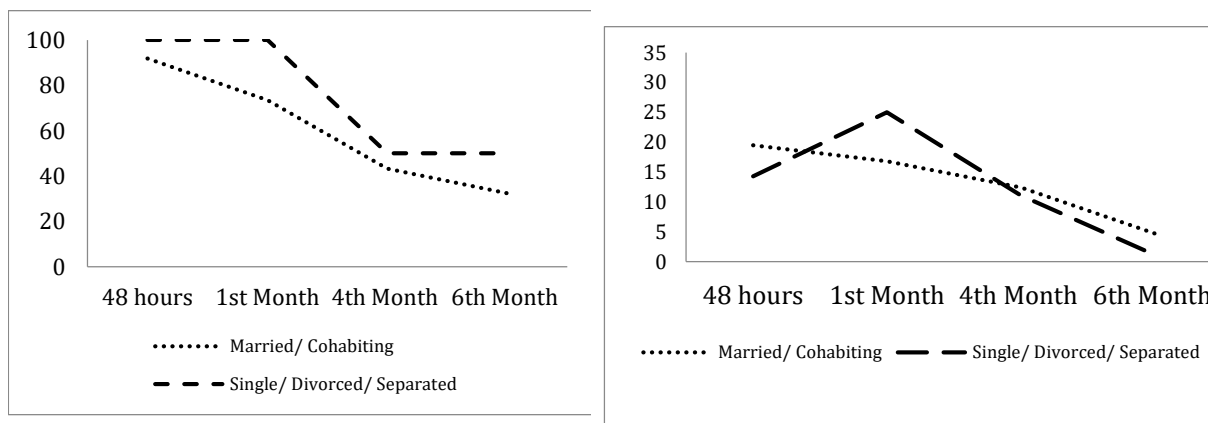
Educational attainment

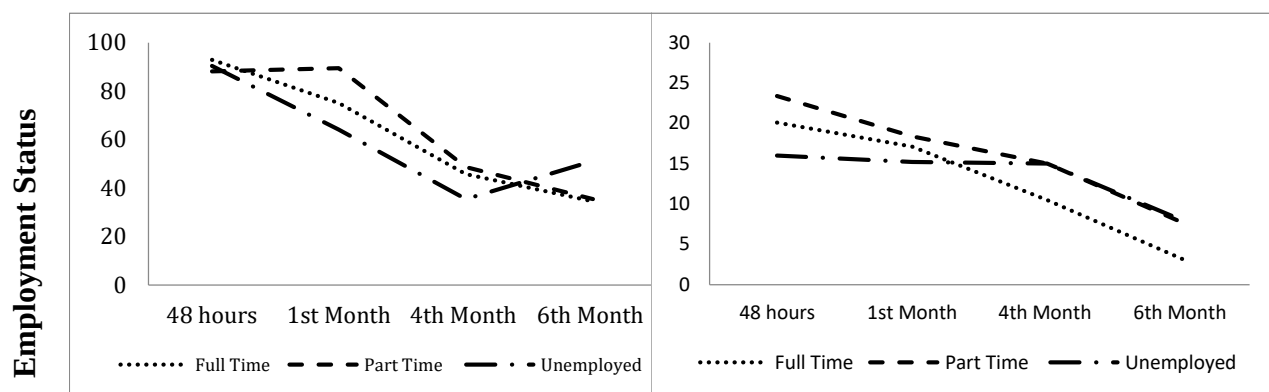
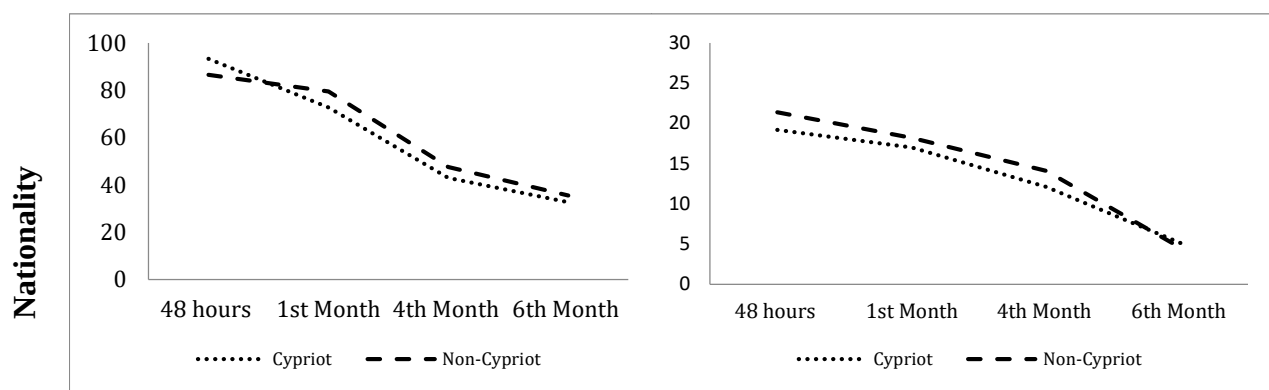


Age



Marital Status





10.4 Association of BF/EBF with S/D characteristics

Table 10.6 and **Table 10.7** presents crude and adjusted odds ratios of BF and EBF, respectively, by socio-demographic factors, as estimated in multivariable logistic models before and after mutually adjusting for each other.

Mode of delivery was the strongest determinant of BF and EBF initiation as well as continuation at least up to the fourth month. Women who had a vaginal birth were about three to four times more likely to initiate BF OR=3.1, 95% CI (1.7, 5.4); p-value<0.001) and to breastfeed exclusively (OR=4.3, 95% CI (2.7, 6.8); p-value=0.001) After controlling for the effect of all other variables, this association appeared even stronger for both BF (adjOR: 4.5, 95% CI 2.1, 10.0) and EBF (adjOR: 5.6, 95% CI 3.3, 9.7). This is more likely attributed to the fact that mothers of higher socioeconomic position (either educational attainment and/or income) were more likely to give birth by C/S, yet more likely to BF/EBF.

In terms of parity, multiparous women appeared 2-3 times more likely to breastfeed exclusively throughout the period, and the observed association remained strong even after adjusting for other socio-demographic variables. Even though the estimates somewhat attenuate in fully adjusted models and were not always statistically significant, evidence of a social gradient in BF and EBF was apparent both in terms of income and educational attainment. Interestingly, the association in terms of education appears stronger than income for both BF and EBF but seems largely restricted to mothers with postgraduate education who appear statistically significantly more likely to breastfeed both at the 4th (adj OR: 2.1, 95% CI 1.1, 3.9) and at the 6th month (adj OR 2.4, 95%CI 1.2, 4.6), compared to mothers with secondary education. The association with educational attainment appeared even stronger in terms of EBF. Women with postgraduate tertiary education appear to be 3.3-times (95% CI 1.3, 8.3) and 16.3-times (95% CI 3.3, 80.3) more likely to be exclusively breastfeeding at the 4th and 6th month respectively, even after controlling for the potential confounding effect of other variables.

In contrast, with regards to income, it seems that the association is stronger in the case of BF (rather than EBF). Specifically, women with higher family income are 3.4-times (95% CI 1.0-11.1) more likely to breastfeed compared to women at the bottom income

category at the first month. Nevertheless, while higher income seems to be predictive as to whether a women will still be breastfeeding at the first month (over and above other variables, including education), it does not seem to have an independent association with exclusivity (OR 0.96 95% CI 0.3, 2.8). At the fourth month, women with higher family income were still 3.2-times (95% CI 1.4, 7.6) more likely to breastfeed, but they did not appear more likely to be exclusively breastfeeding (OR 1.75 95% CI 0.6, 5.4). At the 6th month, they are still 1.7-times more likely to breastfeed, but any difference is no longer statistically significance. It is, of note however, that there is collinearity between family income and educational attainment. Nevertheless, it can be inferred that while income is predictive of whether a woman will be breastfeeding in the long term, it is educational attainment that seems to be more predictive of whether a woman will be breastfeeding exclusively in the longer term.

With regards of employment status, it seems that it is more strongly associated with exclusive breastfeeding rather than breastfeeding. Even though women employed part-time and unemployed mothers are not necessarily more likely to breastfeed at the 4th and 6th month compared to women in full-time employment, those who continue to breastfeed are about twice more likely to be breastfeeding exclusively. While the observed associations are not statistically significant, this observation is suggestive that women in full-time employment who discontinue breastfeeding exclusively after return to work, they discontinue breastfeeding altogether. In contrast, women who do not work or work part-time and are still breastfeeding at the 4th and 6th month are more likely to be doing so exclusively.

Table 10.6: Odds ratios (95% CI) of Breastfeeding at 48 hours, 1st, 4th and 6th month according to each socio-demographic variable before and after mutually adjusting for all other in multivariable binary logistic models.

	48 hours		1 st month		4 th month		6 th month	
	OR	AdjOR	OR	AdjOR	OR	AdjOR	OR	AdjOR
	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)
Mode of Delivery								
C/S	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Vaginal	3.09	4.58	1.90	1.93	2.36	2.60	2.18	2.28
	(1.75, 5.44)	(2.10, 10.02)	(1.16, 3.09)	(1.06, 3.52)	(1.55, 3.57)	(1.60, 4.23)	(1.39, 3.40)	(1.37, 3.78)
Parity								
Primiparous	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Multiparous	0.83	0.84	1.14	1.02	1.74	2.05	1.57	1.83
	(0.51, 1.35)	(0.43, 1.65)	(0.71, 1.82)	(0.55, 1.87)	(1.15, 2.62)	(1.22, 3.45)	(1.01, 2.44)	(1.06, 3.18)
Educational Attainment								
Primary/Secondary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
College/Undergraduate	1.45	1.59	1.50	1.22	1.22	1.26	0.93	1.03
	(0.81, 2.61)	(0.76, 3.33)	(0.87, 2.57)	(0.62, 2.38)	(0.75, 1.97)	(0.71, 2.23)	(0.54, 1.59)	(0.55, 1.94)
Postgraduate	2.98	2.57	2.22	1.13	2.81	2.09	2.47	2.36
	(1.29, 6.91)	(0.89, 7.40)	(1.10, 4.51)	(0.50, 2.55)	(1.63, 4.85)	(1.10, 3.97)	(1.41, 4.31)	(1.21, 4.62)
Monthly Family Income								
≤€1500	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
€1500-€3000	1.71	1.66	1.54	1.68	1.34	1.53	1.06	1.19
	(0.91, 3.24)	(0.76, 3.63)	(0.86, 2.76)	(0.85, 3.33)	(0.83, 2.17)	(0.87, 2.70)	(0.63, 1.77)	(0.64, 2.20)

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	48 hours		1 st month		4 th month		6 th month	
	OR (95% CI)	AdjOR (95% CI)	OR (95% CI)	AdjOR (95% CI)	OR (95% CI)	AdjOR (95% CI)	OR (95% CI)	AdjOR (95% CI)
≥3001	3.53 (1.05, 11.92)	2.89 (0.74, 11.29)	3.88 (1.31, 11.50)	3.38 (1.02, 11.13)	3.91 (1.95, 7.83)	3.24 (1.39, 7.56)	2.30 (1.18, 4.45)	1.71 (0.73, 4.02)
Age (years)								
18-24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25-29	1.03 (0.56, 1.88)	0.56 (0.25, 1.28)	1.45 (0.83, 2.54)	1.47 (0.73, 2.56)	1.48 (0.88, 2.47)	0.97 (0.52, 1.80)	1.13 (0.65, 1.97)	0.78 (0.40, 1.52)
30-34	1.81 (0.79, 4.17)	0.81 (0.28, 2.31)	2.35 (1.12, 4.92)	1.799 (0.70, 4.64)	1.452 (0.78, 2.69)	0.73 (0.33, 1.60)	1.194 (0.62, 2.30)	0.812 (0.36, 1.83)
≥ 35	0.78 (0.29, 2.11)	0.35 (0.09, 1.40)	1.97 (0.67, 5.76)	1.160 (0.30, 4.48)	2.392 (1.01, 5.64)	0.733 (0.24, 2.24)	1.486 (0.62, 3.59)	0.627 (0.19, 2.04)
Marital Status								
Married	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Single/ Divorced/ Separated	1.80 (0.23, 13.98)	1.58 (0.19, 13.40)	-	-	1.31 (0.32, 5.33)	2.16 (0.41, 11.37)	2.09 (0.51, 8.50)	4.41 (0.84, 23.17)
Employment Status								
Full-time	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Part-time	0.94 (0.40, 2.20)	0.84 (0.30, 2.32)	2.82 (0.97, 8.30)	3.92 (1.03, 13.90)	1.12 (0.56, 2.24)	1.42 (0.54, 3.17)	0.76 (0.35, 1.66)	0.83 (0.34, 2.03)
Unemployed	0.49 (0.28, 0.86)	0.60 (0.27, 1.31)	0.60 (0.35, 1.00)	1.05 (0.51, 2.14)	0.65 (0.40, 1.06)	1.31 (0.68, 2.50)	0.86 (0.51, 1.45)	1.39 (0.70, 2.78)

Crude and adjusted odds ratios were estimated in binary logistic regression models. Multivariable models, mutually adjusted for all variables in the Table.

Table 10.7: Odds ratios (95% CI) of Exclusive Breastfeeding at 48 hours, 1st, 4th and 6th month according to each socio-demographic variable before and after mutually adjusting for all other in multivariable binary logistic models.

	48 hours		1 st month		4 th month		6 th month	
	OR (95% CI)	AdjOR (95% CI)	OR (95% CI)	AdjOR (95% CI)	OR (95% CI)	AdjOR (95% CI)	OR (95% CI)	AdjOR (95% CI)
Mode of Delivery								
C/S	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Vaginal	4.33 (2.74, 6.84)	5.65 (3.28, 9.73)	1.84 (1.05, 3.23)	2.02 (1.04, 3.94)	2.36 (1.26, 4.44)	3.34 (1.58, 7.08)	1.75 (0.69, 4.45)	1.74 (0.54, 5.65)
Parity								
Primiparous	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Multiparous	2.80 (1.79, 4.40)	3.88 (2.21, 6.83)	2.62 (1.43, 4.79)	2.76 (1.34, 5.68)	2.47 (1.28, 4.76)	2.75 (1.24, 6.09)	1.05 (0.42, 2.64)	2.82 (0.79, 10.03)
Educational Attainment								
Primary/ Secondary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
College/ Undergraduate	1.08 (0.66, 1.76)	1.34 (0.73, 2.46)	1.36 (0.70, 2.64)	1.43 (0.64, 3.17)	1.46 (0.68, 3.10)	2.12 (0.85, 5.29)	1.41 (0.40, 4.96)	2.54 (0.44, 14.55)
Postgraduate	1.11 (0.64, 1.93)	1.11 (0.56, 2.20)	2.01 (0.97, 4.14)	1.73 (0.73, 4.10)	2.71 (1.28, 5.73)	3.29 (1.31, 8.28)	4.08 (1.32, 12.59)	16.33 (3.32, 80.26)
Monthly Family Income								
≤€1500	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
€1500-€3000	1.07 (0.65, 1.75)	1.37 (0.75, 2.51)	1.28 (0.67, 2.46)	1.21 (0.56, 2.63)	1.15 (0.56, 2.37)	1.50 (0.64, 3.55)	0.77 (0.25, 2.36)	0.60 (0.16, 2.28)

Chapter 10: Prevalence of BF and EBF in Cyprus

≥3001	1.64 (0.88, 3.05)	1.73 (0.78, 3.84)	1.69 (0.74, 3.88)	0.96 (0.33, 2.79)	2.00 (0.87, 4.64)	1.75 (0.57, 5.40)	0.37 (0.05, 2.97)	0.23 (0.02, 2.43)
Age (years)								
18-24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25-29	1.12 (0.65, 1.93)	0.81 (0.41, 1.60)	2.58 (1.08, 6.15)	1.89 (0.69, 5.17)	1.54 (0.68, 3.45)	0.94 (0.36, 2.48)	0.63 (0.22, 1.78)	0.38 (0.09, 1.59)
30-34	1.90 (1.04, 3.45)	1.14 (0.51, 2.53)	4.30 (1.69, 10.93)	2.86 (0.94, 8.75)	1.264 (0.477, 3.348)	0.62 (0.19, 2.06)	0.52 (0.13, 2.09)	0.36 (0.06, 2.18)
≥ 35	0.79 (0.28, 2.23)	0.59 (0.17, 2.07)	2.40 (0.64, 9.00)	1.53 (0.30, 7.66)	2.64 (0.85, 8.16)	1.50 (0.35, 6.47)	0.49 (0.06, 4.11)	0.37 (0.03, 4.58)
Marital Status								
Married	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Single/ Divorced/ Separated	0.70 (0.15, 3.15)	0.96 (0.16, 5.67)	1.66 (0.33, 8.41)	4.18 (0.69, 25.29)	0.89 (0.11, 7.24)	1.73 (0.17, 17.22)	2.52 (0.30, 21.26)	3.28 (0.24, 45.58)
Employment Status								
Full-time	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Part-time	1.20 (0.64, 2.26)	0.975 (0.436, 2.178)	1.10 (0.45, 2.68)	1.12 (0.40, 3.12)	1.51 (0.58, 3.93)	1.71 (0.56, 5.22)	2.52 (0.64, 9.94)	2.92 (0.64, 13.27)
Unemployed	0.74 (0.44, 1.27)	0.832 (0.41, 1.71)	0.87 (0.45, 1.71)	0.91 (0.37, 2.26)	1.51 (0.76, 2.98)	2.16 (0.84, 5.54)	2.63 (0.96, 7.22)	2.08 (0.51, 8.50)

Crude and adjusted odds ratios were estimated in binary logistic regression models. Multivariable models, mutually adjusted for all variables in the Table.

10.5 Reasons for breastfeeding discontinuation

Table 10.8 presents the perceived degree of importance women placed on a list of possible reasons for BF discontinuation. This was self-reported at the sixth month of follow-up, when participating mothers were asked to rate the degree to which they agreed or disagreed that this was for them an important reason on a 5-point Likert-scale.

Milk production insufficiency was the most common reason of BF discontinuation reported among the participating mothers, with as many as 62.5% of women agreeing (22.0%) or strongly agreeing (40.5%) with this statement. Maternal concern of milk quantity consumed by the baby was the second most important reason with one in three women reporting that they agreed or strongly agreed with this statement (31.7%). Return to work ranked at third position, with 23.9%.

Almost 22% of the mothers reported facing breast health problems, including mastitis and inverted nipples that contributed to early discontinuation of BF. On the contrary, previous unpleasant experience of BF and personal decision of the mother to cease breastfeeding, both with 6.3%, smoking with 3.5% and inadequate baby weight gain with 9.8% were among the least common reasons the women reported as important for breastfeeding discontinuation.

10.6 Summary of main findings

While BF initiation was high, premature BF discontinuation was observed with the highest reduction occurring between the first and the fourth month. By the 6th month, 32.4% of the mothers were still breastfeeding. EBF was very low even at 48 hours, estimated at 18.8% and by the sixth month less than 5% of the mothers were still EBF. The prevalence of BF and EBF at fourth and sixth month were estimated both according to the self-reported method as well as the 24-h recall method. Method of estimation did not affect the inferences.

While no difference was observed in terms of BF initiation between the private and the public sector, a higher proportion of mothers who gave birth at the public sector seem to continued to BF at the fourth and sixth month. In contrast, even though fewer mothers initiate EBF in the private sector, compared to the private sector, mothers who give

birth in the private sector appear less likely to discontinue EBF prematurely. Significant differences were observed in BF and EBF initiation and continuation by district. In general, prevalence of BF and EBF was higher in Nicosia and Limassol throughout the first six months. Among the other districts, Larnaca had the lowest BF initiation rates while Paphos had the lowest BF and EBF continuation rates.

A social gradient in favor of mothers of higher socio-economic position was observed. Mothers with higher educational attainment or family income were more likely to initiate and continue BF, at least up to the fourth month. A similar social gradient pattern in terms of educational attainment and family income was also observed for exclusivity. . In terms of mode of delivery, significant differences were observed in EBF, but not for BF initiation. This difference was maintained up to the sixth month and it was most evident among mothers who gave birth with C/S with the use of general anesthesia. In relation to parity, multiparous mothers are more likely to initiate and continue EBF than primiparous mothers. No significant difference in the prevalence of BF initiation or EBF at 48 hours and up to the sixth month by age, marital status, or nationality.

When all determinants were considered, vaginal birth appeared to be among the strongest determinant of BF and EBF initiation as well as continuation at least up to the fourth month. Parity was also associated with EBF and BF at 48 hours and up to the sixth month. In relation to the other socio-demographic characteristics, the association with education appears stronger than income for both BF and EBF, but appears largely restricted to mothers with postgraduate education. Higher family income appeared more predictive of BF, but not for EBF. .

The most common reason of BF discontinuation as reported by the mothers was milk production insufficiency, followed by maternal concern of milk quantity consumed by the baby. Return to work was ranked in third position in relation with the importance of reasons for BF discontinuation. Slightly lower was the proportion of mothers that reported breastfeeding problems as the main reason of BF discontinuation. On the other hand, previous unpleasant experience of BF, personal decision of mother to stop BF, smoking and inadequate baby weight gain were ranked among the lowest positions in relation with the reasons of BF discontinuation.

Table 10.8: *Perceived degree of importance of each reason for BF discontinuation as reported by mothers on a 5-point Likert-scale of agreement-disagreement.*

Reasons	Strongly Disagree (%)	Disagree (%)	Neither Agree or Disagree (%)	Agree (%)	Strongly Agree (%)	% of women reporting agree or strongly
Not enough Milk	21.0	6.3	10.2	22.0	40.5	62.5
Breast Health Issues	60.5	6.8	10.7	11.2	10.7	21.9
Return to Work	60.5	8.8	6.8	6.8	17.1	23.9
Previous Unpleasant Experience	84.4	6.3	2.9	2.9	3.4	6.3
Smoking	91.2	2.9	2.4	1.5	2.0	3.5
Fatigue/ Depression/ Stress	62.4	9.8	11.2	9.8	6.8	16.6
Did not want to/ personal reasons	80.0	7.3	6.3	2.9	3.4	6.3
House Responsibilities	75.1	5.9	7.3	6.8	4.9	11.7
Concern of Milk Quantity	48.3	6.8	12.2	19.5	13.2	32.7
Multiple Pregnancy	98.0	1.5	0.0	0.0	0.5	0.5
Baby inadequate Weight Gain	83.9	3.4	2.9	4.9	4.9	9.8
Baby did not want to	78.0	4.9	4.9	7.3	4.9	12.2
Prematurity	97.6	1.5	1.0	0.0	0.0	0.0
NICU	97.6	1.0	1.0	0.0	0.5	0.5
Baby Sickness	96.6	1.5	0.0	1.0	1.0	2.0
Other reasons	0.0	0.0	0.0	0.5	9.8	10.3

Total number of participating mothers who reported of BF discontinuation or non- BF initiation at the time the interview has taken place=229; Information on the perceived degree of importance of each reasons of BF discontinuation were collected on the sixth month

Chapter 11:

Maternal breastfeeding self-efficacy and breastfeeding

In this Chapter, the evaluation of the psychometric characteristics of the BSES scale in the sample of mothers that participated in the study is presented (Section 11.1). It also provides a summary of the descriptive statistics of the BSES score at both time points (at baseline and at first month) of its measurement nationwide and by sector (**Section 11.2**). Differences in 48 hour and 1st month BFSE according to socio-demographic and other characteristics are presented followed by the investigation of the association of BFSE with S/D and other characteristics (**Sections 11.3 and 11.4**). The Chapter concludes with the delineation of BFSE at 48hours and 1st month on the basis of BF/ EBF status beyond 48hour and up to the sixth month and the examination of the association BFSE with BF initiation and continuation up to the sixth month (**Sections 11.5 and 11.6**).

11.1 Metric properties of BSES

11.1.1 Reliability

In a pilot study with 11 mothers who gave birth in Nicosia maternity clinics, before the launch of the nationwide study, both the internal consistency of the scale (as estimated with Cronbach's alpha coefficient = 0.95) and its test-retest reliability within a two-week period (as estimated using the Intraclass Correlation Coefficient = 0.73) were deemed satisfactory.

In addition to the feasibility of the study (e.g. time needed for completion), this formed an initial assessment of the reliability of the Greek translation of the tool, which had not been previously used in a Greek setting. Paradoxically, even though there was a Greek translation, we could not identify any published studies in the literature that used this scale among a Greek-speaking sample.

In the full baseline sample, the internal consistency of the BSES-SF tool had a Cronbach's α coefficient of 0.94, identical to the one reported in the original study using the BSES-Short Form (0.94) (Dennis, 2003). There was no increase by more than 0.1 in the alpha coefficient in response to the deletion of any one of the items. The inter-item correlations ranged between 0.26 to 0.82, with a mean of 0.55.

11.1.2 Construct Validity

Factor validity

The construct (factorial) validity of the BSES-SF was assessed in Exploratory Factor Analyses (EFA). The correlation matrix was adequate with the majority of the correlation coefficients exceeding 0.3. The Kaiser–Meyer–Olkin coefficient for sampling adequacy (KMO) was 0.96, which is well above the recommended value of 0.60 and the Bartlett’s test of Sphericity was significant ($p\text{-value} < 0.001$), both suggesting that the data are appropriate for factor analysis. Thereafter, a principal components extraction method with a varimax rotation was performed to identify a possible structure in the items of the scale. The default criterion of eigenvalues greater than 1.0 was used as well as an examination of the scree plot.

The analysis yielded a one-factor solution even though the scree test confirmed of a two-dimensional structure of the tool. The first component included eight items, contributing 33.5% of the variance. Most of them, but not all, were more likely to describe Breastfeeding Self-efficacy in terms of the cognitive aspects of breastfeeding, such as “Keep wanting to breastfeed”, “Comfortably breastfeed with my family members present” and “Deal with the fact that breastfeeding can be time-consuming”. The second component included the remaining six items, and contributed to 32.5% of the variance. These were more likely to tap on Breastfeeding self-efficacy that relates to the technical aspects of breastfeeding management. For example, “Determine that my baby is getting enough milk”, “Ensure that my baby is properly latched on for the whole feeding” and “Manage to breastfeed even if my baby is crying”. Nevertheless, it can be argues that the item “Tell when my baby is finished breastfeeding” refers to the technical aspects of breastfeeding, even though it as grouped with the second component. Furthermore, one of the items “Finishing feeding my baby on one breast before switching to the other”, which also, reflects technical aspects of breastfeeding self-efficacy, cross-loaded in both components with similar factor loading values (Component 1: 0.574 vs Component 2: 0.512).

While there was some suggestion that the tool could be tapping on two different aspects of breastfeeding self-efficacy, and thus, it could potentially be used to produce two separate scores, for the purpose of this study, it was preferred to be considered as a unidimensional scale. After all, while these two aspects have been described previously in the literature, calculating only one score with all the items is the most standard approach encounter in the literature. Thus, for comparability

purposes, it was chosen to use only the overall score for further analyses. This is also in line with the suggestions of the developers (Dennis, 2003). **Table 11.1** depicts the principal component analysis of the BSES scale.

Table 11.1: *Principal component analysis of the BSES scale*

		Component 1	Component 2
1	Determine that my baby is getting enough milk		0.803
2	Successfully cope with breastfeeding like I have with other challenging tasks		0.763
3	Breastfeed my baby without using formula as a supplement		0.618
4	Ensure that my baby is properly latched on for the whole feeding		0.752
5	Manage the breastfeeding situation to my satisfaction		0.775
6	Manage to breastfeed even if my baby is crying		0.630
7	Keep wanting to breastfeed	0.784	
8	Comfortably breastfeed with my family members present	0.641	
9	Be satisfied with my breastfeeding experience	0.721	
10	Deal with the fact that breastfeeding can be time-consuming	0.788	
11	Finish feeding my baby on one breast before switching to the other breast	0.574	0.512
12	Continue to breastfeed my baby for every feeding	0.687	
13	Manage to keep up with my baby's breastfeeding demands	0.653	
14	Tell when my baby is finished breastfeeding	0.617	

11.1.3 Concurrent and predictive Validity

Concurrent and predictive validity of the scale was evaluated by assessing the association of BSES scores with breastfeeding initiation and exclusivity at 48 hours and thereafter with breastfeeding practices at the first, fourth and sixth month of the infants' life. As seen on the **Table 11.2**, significant differences in mean BSES scores (as recorded during the first 48 hours) were found between mothers who were breastfeeding and those who were not breastfeeding their infant at the first month (3.58 (SD=0.85) Vs 2.96 (SD=0.93); p-value<0.001). Differences in mean BSES scores between those who did and did not breastfeed were also apparent at every follow-up.

Specifically, mothers who were still breastfeeding at the fourth month had a mean score of in-hospital BSES-SF of 3.74 (SD=0.80) compared to a mean score of 3.15 (SD=0.92) among mothers who were not breastfeeding at that point (p-value<0.001). Similarly, at the sixth month the mean in-hospital BSES-SF score were 3.80 (SD=0.79) vs 3.23 (SD=0.92) between those who were and were not breastfeeding at that time-point (p-value<0.001). Similar findings were observed when using the first month scores. Mothers who were breastfeeding at the first (concurrent validity) as well as fourth and sixth month (predictive validity) had consistently higher scores on average on the BSES-SF scale.

Table 11.2: *Comparison of mean in-hospital and one-month BSES-score among mothers who were breastfeeding and those who were not breastfeeding at the first, fourth and sixth month.*

Mean BSES						
	N	48 hours¥	p-value†	N	1 st month¥	p-value†
At 48 hours						
BF	469	3.43 (0.87)	0.068		-	
Non-BF	35	3.04 (1.19)			-	
1 st month						
BF	251	3.58 (0.85)	<0.001	270	4.06 (0.76)	<0.001
Non-BF	70	2.96 (0.93)		14	3.23 (0.74)	
4 th month						
BF	159	3.74 (0.80)	<0.001	145	4.33 (0.62)	<0.001
Non-BF	184	3.15 (0.92)		111	3.61 (0.80)	
6 th month						
BF	115	3.80 (0.79)	<0.001	107	4.36 (0.59)	<0.001
Non-BF	213	3.23 (0.92)		142	3.71 (0.81)	

¥Values expressed as mean (standard deviation); p-value of independent t-test for continuous variables

Known-group validity

According to Bandura (1977), previous experiences have a significant influence on the levels of self-efficacy. Thus, it can be assumed that multiparous mothers with previous breastfeeding

experience were more likely to have higher levels of BSES compared with primiparous mothers. Thereafter, a known-group comparison analysis was conducted to assess this assumption. Significant differences were observed between the in-hospital BSES-scores between primiparas ($M=3.17$, $SD=0.81$) and multiparas with previous experience ($M=3.74$, $SD=0.84$; $p\text{-value}<0.001$). This difference is both statistically as well as clinically significant, as it represents a 0.7 SD difference in mean scores, which according to previous literature can be predictive of differences in breastfeeding outcomes in the long-term. A similar difference was also evident at the first month after discharge with mean BSES scores of the multiparous mothers being significantly higher ($M=4.23$, $SD=0.68$), compared to primiparous mothers ($M=3.81$, $SD=0.79$; $p\text{-value}<0.001$).

Mothers were further categorized according to exclusivity i.e. those who were exclusively breastfeeding, breastfeeding, but not exclusively and formula feeding at each time-point. BSES scores during the first 48 hours were even higher among mothers who initiated exclusively breastfeeding while at the clinic (Mean=3.92 and $SD=0.80$) compared to those who initiated breastfeeding but not exclusively (Mean=3.29 and $SD=0.84$) and those who were bottle-feeding (Mean=3.04 and $SD=1.09$); $p\text{-value}<0.001$). The observed stepwise increase by exclusivity further supports the concurrent validity of the scale.

A similar stepwise pattern of association with breastfeeding status and BSES scores was observed across all follow-up phases of the study, and irrespective of whether the in-hospital scores or the 1st month scores were used. Consistently, the mothers who were still exclusively breastfeeding at that specific time-point of investigation always had as a group higher on average BSES scores (in-hospital or at 1st month), with mother who were breastfeeding but not exclusively and mothers who were bottle-feeding by that point showing progressively lower scores on average. For example, the group of mothers who were exclusively breastfeeding at the sixth month had the highest in-hospital BSES scores on average (Mean=3.90, $SD=0.76$), followed by mothers who were breastfeeding but not exclusively (Mean=3.73, $SD=0.79$) and lastly, those who were bottle-feeding (Mean=3.23, $SD=0.92$; $p\text{-value}<0.001$).

Even higher were the first-month BSES scores among exclusively breastfeeding mothers at fourth month than those who were either breastfeeding (4.45 (0.54) Vs 4.29 (0.65)) or bottle feeding (4.45 (0.54)Vs 3.60 (0.80); $p\text{-value}<0.001$). Significant differences were also apparent at six months with EBF mothers having higher BSES-scores than breastfeeding or bottle-feeding mothers.

Table 11.3: Mean BSES-score among exclusively breastfeeding mothers and non-breastfeeding mothers during the first 48 hours, first, fourth and sixth month

Mean BSES-score						
	N	48 hours ¥	p-value	N	1 st month	p-value
At 48 hours						
EBF	104	3.92 (0.80)	<0.001		-	
BF	365	3.29 (0.84)			-	
Non-BF	35	3.04 (1.09)			-	
1 st month						
EBF	58	3.85 (0.86)	<0.001	64	4.39 (0.66)	<0.001
BF	193	3.49 (0.84)		206	3.95 (0.75)	
Non-BF	70	2.96 (0.93)		14	3.23 (0.74)	
4 th month						
EBF	45	3.96 (0.67)	<0.001	40	4.45 (0.54)	<0.001
BF	114	3.65 (0.82)		105	4.29 (0.65)	
Non-BF	184	3.15 (0.92)		111	3.60 (0.80)	
6 th month						
EBF	18	3.90 (0.76)	<0.001	19	4.55 (0.35)	<0.001
BF	97	3.73 (0.79)		88	4.32 (0.62)	
Non-BF	213	3.23 (0.92)		142	3.71 (0.81)	

¥Values expressed as mean (standard deviation); p-value of independent t-test for continuous values

11.2 Descriptive statistics

11.2.1 By sector

Table 11.4 presents the differences in mean BSES scores between the public and the private sector during hospital stay and at first month. Mean breastfeeding self-efficacy levels appeared higher among women who gave birth at the public sector with 3.55 (SD=0.92) compared to those at the private sector with 3.31 (SD=0.87; p-value= 0.004). This difference is statistically significant. Even though it represents a small-to-moderate effect size of 0.3SD, it appears to be clinically significant to some extent since, as discussed in the previous chapter, while initiation of breastfeeding did not differ between the public and private sector, a statistically significant difference was observed in terms of the prevalence of exclusive breastfeeding as well as in terms of breastfeeding (even if it's not exclusively) in the long run, favouring the public sector. Higher mean maternal BSES was observed at first month (4.23 vs 3.86, respectively), while at the same time the variability is reduced for both groups of women giving birth in the public or the private sector. The difference, however, between the two sectors appears wider at this time-point and it corresponds to a larger effect size of 0.5 SD difference (p-value<0.001).

Table 11.4: Differences in mean BSES scores during the first 48 hours and at first month between the public and the private sector

	48 Hours		1 st Month	
	N§	Mean (SD) ¥	N§	Mean (SD) ¥
Public	187	3.55 (0.92)	120	4.23 (0.71)
Private	317	3.31 (0.87)	164	3.86 (0.79)
p-value		0.004		<0.001

§Total of mothers that reported BF at 48 hours and the first month; 494 and 214 respectively;
 ¥Values expressed as mean (standard deviation); p-value of independent t-test for continuous values

11.2.2 Nationwide

Table 11.5 displays the descriptive statistics of BSES scale at both time points of its measurement in the full sample. Note that the majority of mothers who did not breastfeed at the 48 hours or those who were not breastfeeding at the first month did not respond to the scale. Nevertheless, 35 and 14 women who were not breastfeeding at the 48 hours and at the first month respectively completed the scale, and were included in the analysis. At the same time, a small number of women who were breastfeeding (N=25 and N=4 at 48 hours and 1st month respectively) did not respond to the scale, or did not respond to all items of the scale, and were thus not included in the analysis. The sample size with complete questionnaires was N=504 at 48 hours (i.e. 469 among 494 mothers classified as breastfeeding and 35 classified as non-breastfeeding) and N=284 at the first month (i.e. 270 among 274 mothers classified as breastfeeding and 14 classified as non-breastfeeding).

The mean breastfeeding self-efficacy score was 3.55 (SD=0.85) within the first 48 hours. This represents moderate levels of maternal breastfeeding self-efficacy. If expressed as a sum score (instead of the average score), this corresponds to 49.7, which is slightly lower than what is commonly reported among other populations in the international literature (>50), with some exceptions, such as Hong Kong Chinese mothers (Ip *et al.* 2012). Furthermore, the observed variability among mothers in Cypriot maternity clinics is within the range of the variability, if not somewhat higher than the variability observed in populations elsewhere, since a SD of 0.85 (on a 1-5 scale) corresponds to a SD of 12 on a 14-70 scale. At the first month, the mean BSES score was 4.01 (SD=0.79) which indicates that establishment of breastfeeding by the first month was associated with higher levels of maternal breastfeeding self-efficacy.

Table 11.5: *Mean Breastfeeding Self-Efficacy within the first 48 hours after birth and at 1st month*

	48 hours	1st Month
<i>N</i>	504	284
<i>Mean (SD)</i>	3.55 (0.85)	4.01 (0.79)
<i>Median</i>	3.57	4.14
<i>Min</i>	1.00	1.00
<i>Max</i>	5.00	5.00
<i>Range</i>	4.00	4.00
<i>IQ Range</i>	1.25	1.07
<i>95% CI</i>	3.44-3.65	3.92-4.14
<i>Scale</i>	1-5	

11.3 Differences in BSES by S/D and other characteristics

Table 11.6 presents the differences in mean BSES at 48 hours and at first month in relation to the socio-demographic characteristics of the participants.

A significant difference in mean BSES scores was observed by mode of delivery. Mothers who had a vaginal delivery were more likely to have higher levels of BSES at 48 hours (3.57, SD=0.87) than those who gave birth with C/S with (3.37, SD=0.93) and without general anesthesia (3.23, SD=SD: 0.89; $p\text{-value} < 0.001$). Even though, an increase in the BSES levels was observed by the first month for both vaginal and C/S delivery, BSES was maintained at significantly higher levels for mothers who experienced vaginal delivery.

When a Bonferroni post hoc test was performed, the type of C/S delivery was found to be related with BSES score in the long run. At 48 hours significant differences in BSES score were evident between vaginal delivery and C/S without general anesthesia (mean difference= 0.34; $p\text{-value} < 0.001$), rather than with C/S with general anesthesia (mean difference= 0.20; $p\text{-value} = 0.303$). At the first month, however, greater differences in BSES scores were observed between vaginal delivery and C/S with general anesthesia (mean difference: vaginal vs C/S with

gen anesthesia= 0.44; p -value=0.02), while there was a reduction in the difference between vaginal delivery and C/S without general anesthesia, which was no longer statistically significant.

Mothers who intended to EBF for six months reported significantly higher levels of BSES from the first 48 hours (3.37 (SD 0.82) vs 2.85 (SD 0.93); p -value<0.001). A difference of a similar magnitude was also apparent at the first month (4.08 (0.75) vs 3.53 (0.85); p -value<0.001).

With regards to ethnicity, Cypriot mothers (mean=3.29, SD=0.86) were more likely to have lower levels of BSES during the first 48 hours than non-Cypriot mothers (mean=3.83, SD=0.88; p -value<0.001). This difference appeared smaller by the first month, but remained statistically significant (p -value=0.026).

As expected, multiparous mothers with previous experience on BF were more likely to have higher BSES levels at 48 hours compared to both primiparas as well as multiparas without BF experience. Multiparous women, who have nevertheless not breastfed their previous children, appear to have the lowest levels of breastfeeding self-efficacy, even compared to primiparas. However, the difference observed in BSES scores between the primiparas and multiparas without previous experience (p -value=0.045) diminished by the first month.

Surprisingly, mothers who had a postgraduate degree had the lowest BSES scores (Mean=3.22, SD=0.85) compared to both mothers with tertiary (University or College) education (Mean=3.51, SD=0.91) as well as those with secondary/primary education (Mean=3.51, SD=0.91; p -value=0.025). This difference, however, was no longer apparent by first month, and the mean scores of the three groups appear very similar, as mothers with postgraduate education appear to have had the largest increase in breastfeeding self-efficacy in this period. This appears consistent with the finding, discussed earlier that, even though there was no difference in the likelihood to initiate exclusive breastfeeding according to educational attainment, in the long term mother with a postgraduate education were 1.8-times (1st month), 2.3-times (4th month) and 3.7-times (6th month) more likely to be exclusively breastfeeding compared to mothers with primary or secondary education

There was no difference in BSES scores at 48 hours or at first month according to maternal age, employment status or family income.

Table 11.6: Mean Maternal Breastfeeding Self-Efficacy by each socio-demographic and other factors

	<i>N</i>	<i>n</i>	48 hours [†]	<i>p</i> -value	<i>N</i>	<i>n</i>	1 st month [†]	<i>p</i> -value
Age (years)	498				269			
18-24		126	3.43 (0.85)	0.448		62	4.04 (0.68)	0.935
25-29		231	3.41 (0.90)			129	4.00 (0.80)	
30-34		108	3.31 (0.96)			59	3.96 (0.91)	
≥35		33	3.59 (0.90)			19	4.06 (0.66)	
Education	488				262			
Primary/ Secondary		208	3.41 (0.90)	0.025		116	4.03 (0.77)	0.747
College/ Undergraduate		162	3.51 (0.91)			89	3.99 (0.76)	
Postgraduate		118	3.22 (0.85)			57	3.94 (0.87)	
Marital Status	497				267			
Married/ Cohabiting		484	3.39 (0.90)	0.337		259	4.00 (0.79)	0.694
Single/ Divorced/ Separated		13	3.63 (0.86)			8	4.10 (0.69)	
Employment Status	494				266			
Full Time		324	3.35 (0.87)	0.163		170	3.94 (0.82)	0.175
Part Time		55	3.54 (0.94)			33	4.04 (0.68)	
Unemployed		115	3.49 (0.92)			63	4.16 (0.75)	
Monthly Family Net Income	447				244			
≤ €1500		202	3.44 (0.90)	0.456		119	4.05 (0.72)	0.149
€1501- €3000		178	3.33 (0.86)			86	3.88 (0.86)	
≥ €3001		67	3.43 (0.94)			39	4.09 (0.82)	
Country of Origin	492				264			

	<i>N</i>	<i>n</i>	<i>48 hours</i> [†]	<i>p-value</i>		<i>N</i>	<i>n</i>	<i>1st month</i> [†]	<i>p-value</i>
Cypriot		380	3.29 (0.86)	<0.001			194	3.95 (0.78)	0.026
Not Cypriot		112	3.83 (0.88)				70	4.19 (0.77)	
Type of Birth	504					275			
Vaginal		223	3.57 (0.87)	<0.001			135	4.17 (0.73)	0.002
C/S w/t gen anesthesia		213	3.23 (0.89)				93	3.93 (0.81)	
C/S w gen anesthesia		68	3.37 (0.93)				47	3.72 (0.76)	
Parity	503					284			
first child		246	3.17 (0.81)	<0.001			140	3.81 (0.79)	<0.001
Multiparous w/t previous experience		32	2.78 (1.01)				7	3.70 (1.18)	
Multiparous w/ previous experience		225	3.74 (0.84)				137	4.23 (0.67)	
Intention for Exclusive breastfeeding	497					268			
Yes		405	3.54 (0.83)	<0.001			236	4.06 (0.76)	0.001
No		92	2.80 (0.94)				32	3.56 (0.85)	
Intention for exclusive breastfeeding during the first six months	492					265			
Yes		377	3.57 (0.82)	<0.001			225	4.08 (0.75)	<0.001
No		115	2.85 (0.93)				40	3.53 (0.85)	

Total number of mothers that completed the BSES scale at 48 hours and 1st first month: 504 and 284;

[†]Missing Data excluded from the statistical analysis; p-values as estimated using independent t-test or ANOVA test for continuous variables, as appropriate..

11.4 Association of BSES with S/D and other characteristics

11.4.1 At 48 hours

A stepwise regression analysis was performed in order to identify the impact of socio-demographic and other predictors of in-hospital BSES scores. Among the variables included in the regression model, only six were significantly associated with mean BSES. These factors explained 24% of the variance in BSES as recorded within the first 48 hours postnatally.

Intention to EBF was the most predictive variable of BSES score at 48 hours with $\beta = -0.642$ (95% CI: -0.834, -0.450; p -value<0.001). Furthermore, mothers who BF during the first 48 hours were likely to have higher mean BSES score by 0.498 (95% CI: -0.862, -0.133; p -value=0.008) than those that did not initiate BF during hospital stay. Mode of delivery also appeared to be associated with BSES. Specifically, in-hospital mean BSES scores were on average lower among mothers who gave birth with C/S (but paradoxically only without general anesthesia) compared to those who had a vaginal delivery ($\beta = -0.273$; 95% CI: -0.427, -0.120; p -value=0.001).

Among the socio-demographic factors, only maternal education, parity and national origin were predictive of mean BSES score. Parity was the most predictive socio-demographic variable with $\beta = 0.414$ (95% CI: 0.264, 0.564; p -value=<0.001) in favor of multiparous mothers. In relation to educational attainment, mean BSES scores were slightly higher among mothers with university education (but not postgraduate degree) compared to those with primary or secondary school education ($\beta = 0.182$; 95% CI: 0.022, 0.342; p -value=0.026). Finally, mothers of non-Cypriot origin appeared to have higher BSES scores compared to Cypriot mothers with $\beta = 0.422$ (95% CI: 0.240, 0.604; p -value<0.001).

Table 11.7: Stepwise Linear Regression model of Maternal Breastfeeding Self-Efficacy at 48 hours on socio-demographic and other variables.

	Difference in Means	t	95% CI	p- value	R	R ²
<i>No intention to EBF</i> (Vs <i>Intention to EBF</i>)	-0.642	-6.562	-0.834, -0.450	<0.001	0.491	0.241
<i>2 or more children</i> (Vs <i>1 child</i>)	0.414	5.417	0.264, 0.564	<0.001		
<i>Non Cypriots</i> (Vs <i>Cypriots</i>)	0.422	4.562	0.240, 0.604	<0.001		
<i>Cesarean w/t gen anesthesia (Vs Vaginal Delivery)</i>	-0.273	-3.499	-0.427, -0.120	0.001		
<i>Not BF</i> (Vs <i>BF during the first 48 hours</i>)	-0.498	-2.684	-0.862, -0.133	0.008		
<i>College/ Undergraduate (Vs Elementary/ Secondary education)</i>	0.182	2.235	0.022, 0.342	0.026		

¥Stepwise Linear Regression performed; Covariates included in the model: *Maternal Age, Education, Marital Status, Employment Status, Family Income, Country of Origin, Mode of Birth, Parity, Intension to Exclusively Breastfeed, Intension to Exclusively Breastfeed during the first 6 months, Breastfeeding during the first 48 hours,*

11.4.2 At 1st month

The stepwise regression analysis was repeated to investigate the association of the socio-demographic and other maternal characteristics with mean BSES score as recorded at first month postpartum. In this case, the regression model revealed only three variables. However, these three variables alone explained as much as 34.3% of the variance

The three variables that were predictive of breastfeeding self-efficacy scores once the mother was at home at the first month were: self-reported intention to exclusively breastfeed, having breastfed

while in hospital, and parity. Specifically, in-hospital BSES scores were lower by $\beta=-0.676$ among those mothers who did not BF while in hospital (95% CI: -1.295, -0.057, p-value=0.032) and lower by $\beta=-0.484$ among mothers who did not report that they intended to exclusively breastfeed (95% CI: -1.295, -0.057, p-value=0.032). Among the sociodemographic characteristics, only parity appeared to influence 1-month BSES scores (multiparous vs primiparous: $\beta=0.407$; 95% CI: 0.208, 0.606; p-value=<0.001).

Table 11.8: Stepwise Linear Regression model of Maternal Breastfeeding Self-Efficacy at the first month on socio-demographic and other variables.

	Difference in Means	t	95% CI	p-value	R	R ²
2 or more children (Vs 1 Child)	0.407	4.033	0.208, 0.606	<0.001	0.343	0.117
No Intention to EBF (Vs Intention to EBF)	-0.484	-3.198	-0.782, -0.186	0.005		
Not BF (vs BF during the first 48) hours	-0.676	-2.152	-1.295, -0.057	0.032		

¥Stepwise Linear Regression performed; Covariates included in the model: *Maternal Age, Education, Marital Status, Employment Status, Family Income, Country of Origin, Type of Birth, Parity, Intension of Exclusive Breastfeeding, Intension for Exclusive Breastfeeding during the first 6 months, Breastfeeding during the first 48 hours,*

11.5 Differences in BSES by BF and EBF

11.5.1 BSES at 48 hours

11.1.5.1 Exclusive Breastfeeding (EBF)

To investigate the association of BSES with BF status, we categorized participating mothers based on their BSES scores during the first 48 hours into quartiles with the lowest quartile (range: 1.00-2.71) representing the quartile of mothers with the lowest mean scores and in the upper quartile, the quartile of mothers with the highest BSES scores included (range: 4.07-5.00). The second quartile ranged between 2.71-3.50 and the third quartile between 3.50-4.07.

As shown in **Table 11.9**, both EBF and BF initiation as well as continuation up to the sixth month showed a clear stepwise increasing pattern across quartiles of mothers with increasing BSES score. For instance, the quartile of mothers with the highest BSES scores were more likely to breastfeed exclusively during their stay at the maternity clinic. As many as 40% among them initiated exclusive breastfeeding. In contrast, among the quartile of mothers with the lowest BSES scores only 7.9% initiated EBF ($p\text{-value} < 0.001$). The prevalence of EBF for the two middle groups (2nd and 3rd quartiles) appeared in-between with 15.1% and 19.0%, respectively.

At the first month, among mothers at the upper quartile of in-hospital BSES scores about three times as many as those in the lower quartile were exclusively breastfeeding (30.7% vs 10.4%) and about twice as many as those in the second and third quartile (30.7% vs 14.1% vs 15.4%, respectively). Differences in the prevalence of EBF at the fourth month widened further, as the proportion of mothers at the upper quartile of in-hospital BSES scores were about eight times more likely to be exclusively breastfeeding compared to women at the lower quartile. By the sixth month, there appears to be a sharper decline in the prevalence of EBF even among the mothers with the highest in-hospital BSES scores. Nevertheless, even though fewer than 10% of the mothers at the upper quartile were exclusively breastfeeding at the sixth month, this figure was still about four, three and two times higher compared to the respective figure observed among mothers at the lowest (2.3%), the second (3.3%) and the third quartile (4.7%) of BSES scores respectively. Even though the magnitude of the observed differences is large (1 in 10 Vs 1 in 50 women in the upper vs lower quartile), they are not statistically significant ($p\text{-value}=0.143$), most likely due to the small number of women exclusively breastfeeding by that time.

11.5.1.2 Any Breastfeeding (BF)

In terms of breastfeeding initiation (even if not exclusive), the pattern is not as clear. A higher proportion of mothers in the upper quartile of BSES scores initiated BF (93%) compared to the lowest quartile (87.3%), but this was identical to the women in the third (93.7%) and even slightly lower than the second quartile (97.6%). By the first month though, a clearer picture with regards to the association of BF with the 48-hour BSES scores is evident. A significantly smaller proportion of mothers at the upper quartile of BSES scores appeared to discontinue BF compared to women with lower BSES scores, and especially compared to women with the lowest breastfeeding self-efficacy scores. Specifically, among the quartile of women with the highest in-hospital BSES scores 89.9% are breastfeeding at the first month Vs. progressively lower percentages among women at the third quartile (82.1%), the second quartile (79.5%) down to only 59.7% among women with in-hospital BSES scores at the lowest quartile ($p\text{-value} < 0.001$). The differences in the prevalence of BF appears to widen further at the fourth month with 61.1% of women at the upper quartile are breastfeeding (a relative reduction of 0.7-times, or 30%, compared to the first month) versus 25.9% among women at the lowest quartile (a reduction of 0.4-times, or more than 50%) compared to the first month). Similarly, the pattern continues to the sixth month where the prevalence of BF is still as high as 45.5% among women with the highest in-hospital BSES scores (representing a reduction by a factor of two compared to the first month) compared to only 17.5% breastfeeding among the women at the lower quartile of scores (representing a reduction of a factor of 3 compared to the first month).

11.5.2 BSES at 1st month**11.5.2.1 Exclusive Breastfeeding (EBF)**

An even more striking difference was found in the prevalence of BF and EBF across quartiles of women with increasing levels of BSES scores when those were measured at the first month after birth. Almost half the mothers (46.5%) among those with 1st-month BSES scores in the upper quartile were exclusively breastfeeding at the first month in comparison with less than 10% of mothers in the lowest quartile (i.e. 5-times lower), while in the second and third quartiles, the proportion of the mothers exclusively breastfeeding was in the range of 15.5%-18.3%. The

differences in the prevalence of EBF were even more remarkable at the fourth month, when 30.4% of the mothers at the upper quartile were exclusively breastfeeding compared to only 2.9% the lowest quartile of 1st-month BSES scores (i.e. up to 10-times lower). The prevalence of EBF at the upper quartile was reduced to about half by the sixth month at 14.9%, which was, nevertheless, still twice higher than in the third and second quartile (7.1% and 5.7%, respectively). Among the quartile of mothers with the lowest BSES scores at the 1st month, none was EBF at the sixth month.

11.5.2.2 Any Breastfeeding (BF)

All women in the quartile with the highest BSES scores at the first month of measurement reported breastfeeding at the first month, compared to progressively lower percentages of women with decreasing BSES scores (100% vs 98.6% vs 95.8% vs 85.9%; p-value < 0.001). The difference in the prevalence of BF across the quartiles appeared much wider in the longer term, since the lowest reduction was observed at the upper quartile from 100% at the first month to 84.4% and 72.9% at the sixth month. On the other hand, the reduction observed in the other quartile groups was more striking. For example, the prevalence of BF among women at the lower quartile fell by 68.2 percentage points between the first and fourth month (from 85.9% to 17.7%), and a further 5.2% (down to 12.5% at the sixth month). Decreases in the prevalence of BF also appeared significantly larger among the women in the middle quartiles compared to the upper quartile. At the fourth month, there was a reduction by 40.2% (from 95.8% to 55.6%) and by 31.4% (from 98.6% to 67.2%) in the second and third quartiles respectively. A further reduction was observed at sixth month when around 40.3%-48.5% of the mothers were reporting BF in the middle quartiles, compared to as many as 72.9% of women with the highest scores of BSES at the 1st-month.

Table 11.9: Prevalence of Breastfeeding and Exclusive Breastfeeding at the first 48 hours as well as at the first, fourth and sixth month according to quartiles of women with increasing levels of Perceived Breastfeeding Maternal Self-Efficacy Scale as measured within 48 hours after birth

	48 hours				1 st Month				4 th Month				6 th Month			
	<i>N</i>	<i>EBF</i> % (<i>N</i>)	<i>N</i>	<i>BF</i> % (<i>N</i>)	<i>N</i>	<i>EBF</i> % (<i>N</i>)	<i>N</i>	<i>BF</i> % (<i>N</i>)	<i>N</i>	<i>EBF</i> % (<i>N</i>)	<i>N</i>	<i>BF</i> % (<i>N</i>)	<i>N</i>	<i>EBF</i> % (<i>N</i>)	<i>N</i>	<i>BF</i> % (<i>N</i>)
Lower Quartile (range:1.00-2.71)	126	7.9 (10)	126	87.3 (110)	77	10.4 (8)	77	59.7 (46)	86	3.5 (3)	85	25.9 (22)	87	2.3 (2)	80	17.5 (14)
2nd Quartile (range: 2.71-3.50)	126	15.1 (19)	126	97.6 (123)	78	14.1 (11)	78	79.5 (62)	89	9.0 (8)	84	33 (39.3)	91	3.3 (3)	84	27.4 (23)
3rd Quartile (range: 3.50-4.07)	126	19.0 (24)	126	93.7 (118)	78	15.4 (12)	78	82.1 (64)	85	12.9 (11)	79	58.2 (46)	85	4.7 (4)	76	50.0 (38)
Upper Quartile (range: 4.07-5.00)	126	40.5 (51)	126	93.7 (118)	88	30.7 (27)	88	89.8 (79)	100	23.0 (23)	95	61.1 (58)	99	9.1 (9)	88	45.5 (40)
P-value		<0.001		0.014		0.003		<0.001		0.001		<0.001		0.143		<0.001
p-value for trend		<0.001		0.137		0.001		<0.001		<0.001		<0.001		0.028		<0.001

Estimation of the prevalence of Breastfeeding and Exclusive Breastfeeding according to quartiles of Perceived Breastfeeding Maternal Self-Efficacy Scale during the first 48 hours; Sample Size at each time point: N= 586 during the first 48 hours, N=372 at 1st month, N=415 at 4th month and N=417 at 6th month; p-values of Chi-square test of independence and chi-square test for trend (Linear-by-Linear) is reported

Figure 11.1: Prevalence of breastfeeding and exclusive breastfeeding by quartile of participating mothers based on their BSES scores at 48 hours

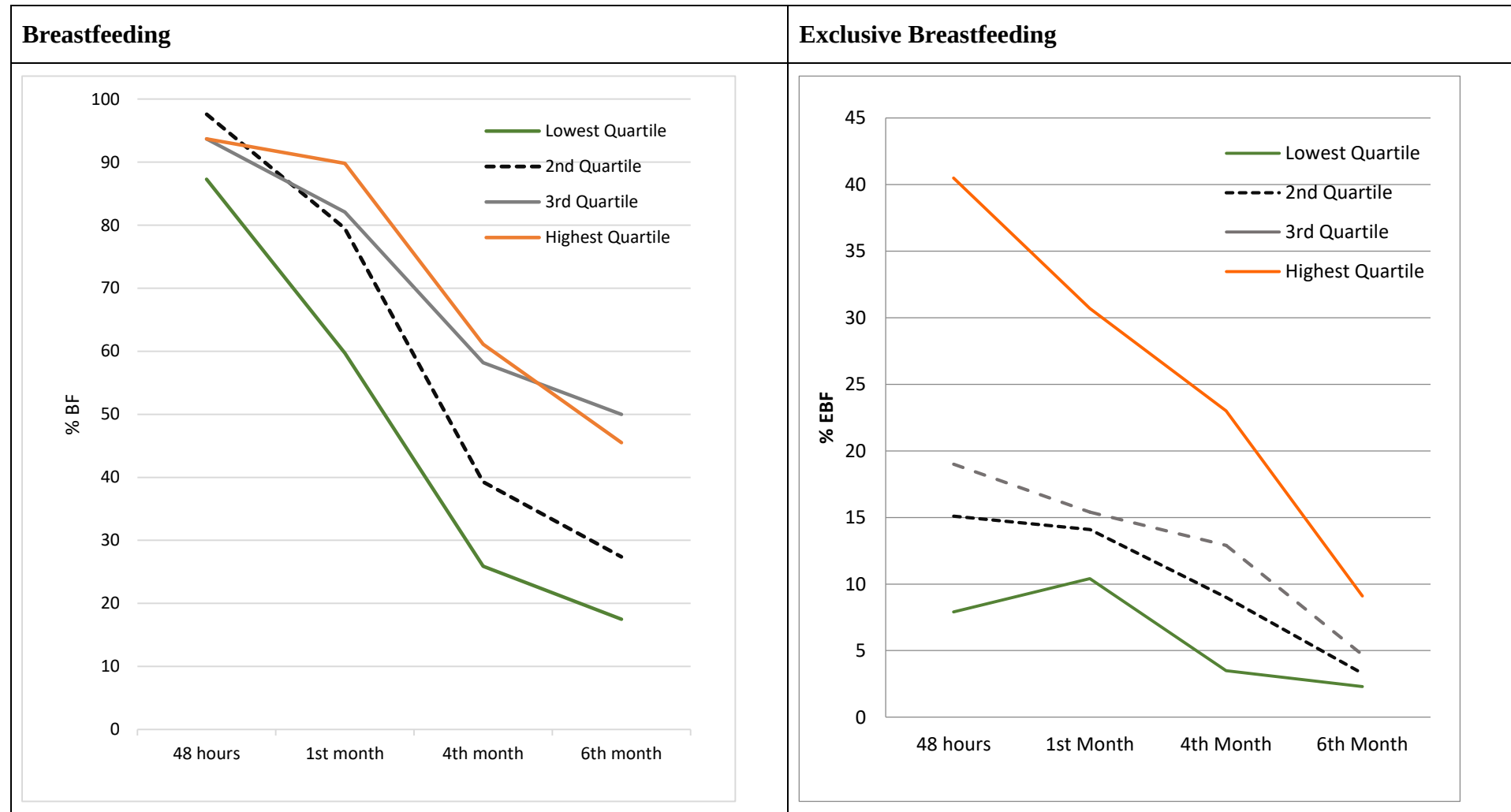
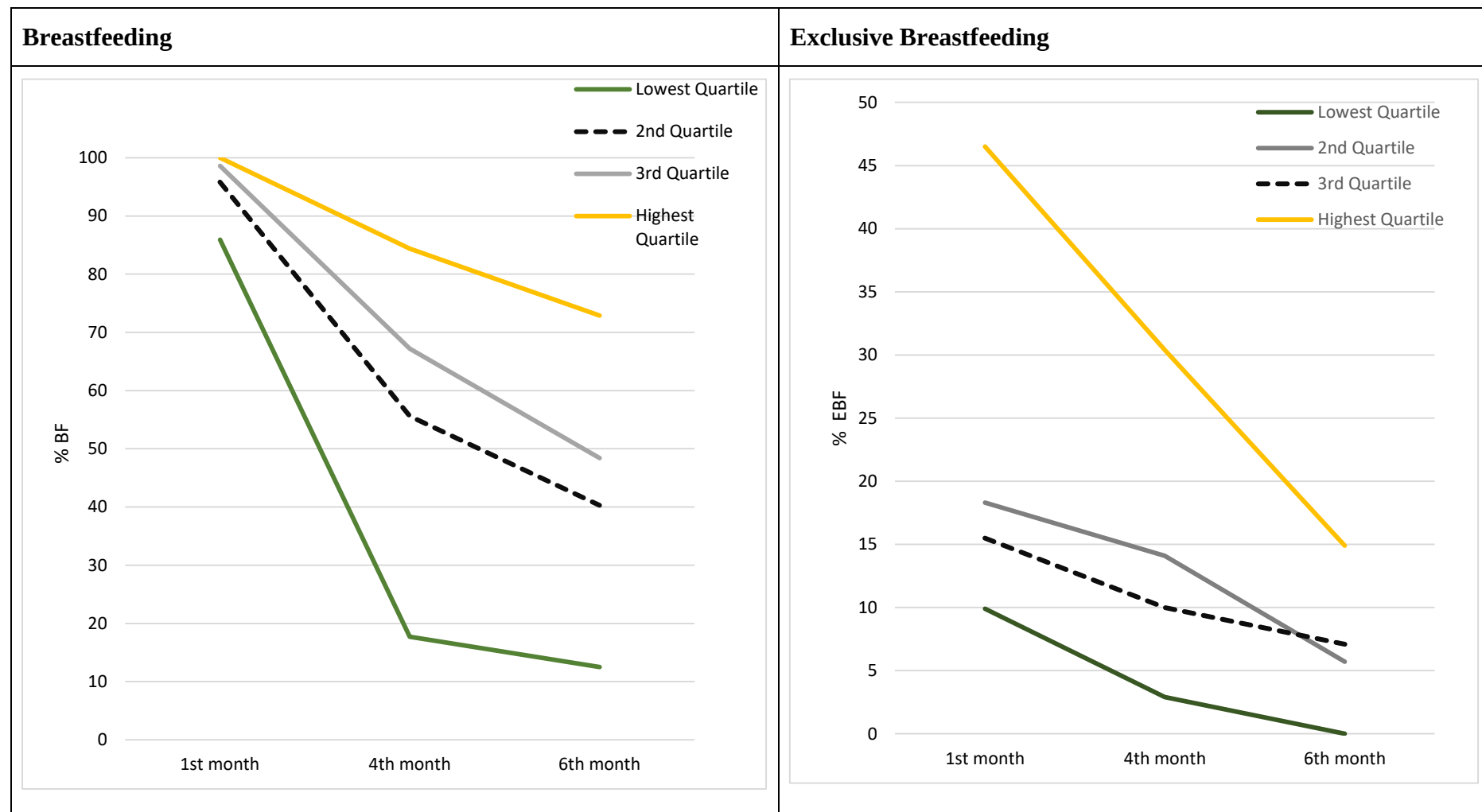


Table 11.10: *Prevalence of Breastfeeding and Exclusive Breastfeeding at the first, fourth and sixth month according to quartiles of women with increasing levels of Perceived Breastfeeding Maternal Self-Efficacy Scale as measured at the first month after birth*

	<i>1st Month</i>				<i>4th Month</i>				<i>6th Month</i>			
	<i>N</i>	<i>EBF</i>	<i>N</i>	<i>BF</i>	<i>N</i>	<i>EBF</i>	<i>N</i>	<i>BF</i>	<i>N</i>	<i>EBF</i>	<i>N</i>	<i>BF</i>
		<i>% (N)</i>		<i>% (N)</i>		<i>% (N)</i>		<i>% (N)</i>		<i>% (N)</i>		<i>% (N)</i>
Lowest Quartile (range: 1.00-3.57)	71	9.9 (7)	71	85.9 (61)	70	2.9 (2)	62	17.7 (11)	70	0.0 (0)	64	12.5 (8)
2nd Quartile (range: 3.57-4.14)	71	18.3 (13)	71	95.8 (68)	71	14.1 (10)	63	55.6 (35)	70	5.7 (4)	62	40.3 (25)
3rd Quartile (range: 4.14-4.64)	71	15.5 (11)	71	98.6 (70)	70	10.0 (7)	67	67.2 (45)	70	7.1 (5)	64	48.4 (31)
Highest Quartile (range: 4.64-5.00)	71	46.5 (33)	71	100.0 (71)	69	30.4 (21)	64	84.4 (54)	67	14.9 (10)	59	72.9 (43)
P-value		<0.001		<0.001		<0.001		<0.001		0.007		<0.001
p-value for trend		<0.001		<0.001		<0.001		<0.001		0.001		<0.001

Estimation of Breastfeeding and Exclusive Breastfeeding Rates at first, fourth and sixth month according to Perceived Breastfeeding Maternal Self-Efficacy Scale Quartiles at first month; total number of mothers that participated at each time point: N= 586 during the first 48 hours, N=371 at 1st month, N=415 at 4th month and N=417 at 6th month; p-value of Chi-square test for categorical variables was used

Figure 11.2: Prevalence of breastfeeding and exclusive breastfeeding by quartile of participating mothers based on their BSES scores at first month



11.6 Association of BSES with BF/EBF initiation and duration up to the sixth month

A binary logistic regression model was performed in order to determine the association of in-hospital maternal BSES with initiation and continuation of breastfeeding and exclusive breastfeeding up to the sixth month, before and after adjusting for socio-demographic and other variables. Multivariable models adjusted for maternal age, educational attainment, marital status, employment status, family income, parity, country of origin, mode of delivery, and previous BF Experience. Models looking at the association of BSES with BF/EBF past the 48 hours, additionally adjusted for BF at 48 hours, in order to estimate the independent association of maternal breastfeeding self-efficacy with breastfeeding behaviour in the longer term over and above the actual practice of breastfeeding.

11.6.1 EBF by BSES at 48 hours

In unadjusted models a stepwise increase was observed in the odds of EBF initiation as well as at all other time-points across quartiles of women with increasing levels of BSES at 48 hours. For instance, mothers in the second and third quartile were about two to three times more likely to initiate EBF compared to those in the lowest quartile, while the likelihood of women at the upper quartile to initiate exclusive breastfeeding is 8-times higher (OR=7.89, 95% CI: 3.77-16.49; p-value<0.001). In the multivariable model, the association appears even stronger with adjOR= 9.94 (95% CI: 3.72-26.58; p-value<0.001) in the upper quartile. In relation to EBF continuation up to the sixth month, a statistically significant association with BSES scores at 48 hours was observed throughout the study period. The association appeared the strongest at the fourth month (unadjOR: 8.26; 95% CI: 2.386, 28.627; p-value=0.001 and adjOR= 13.66; 95% CI: 2.72-68.60; p-value<0.001). At the sixth month, the association attenuated and was no longer statistically significant, possibly due to the small number of women exclusively breastfeeding at the 6th month. Nevertheless, the magnitude of the observed association was still quite large (unadjOR: 4.250, 95% CI: 0.893, 20.237, p-value=0.069 and adjOR= 8.90; 95% CI: 0.91-86.88; p-value=0.060).

11.6.2 BF by BSES at 48 hours

Within the first 48 hours, mothers at the second quartile (second lowest BSES scores) appear to be nearly six times more likely (unadjOR: 5.95; 95% CI: 1.70-21.02; p-value=0.005) to initiate in-hospital BF compared to women in the lowest quartile. Women with higher BSES scores (third and upper quartile) were also more likely to initiate BF; however, the odds were only twice higher compared to women in the lowest quartile (unadjOR: 2.15; 95% CI: 0.88, 5.21; p-value=0.09 for both quartiles). The extent to which this unexpected finding is suggestive of extra assistance and support by maternity clinic staff provided to women with lower self-efficacy but who nevertheless wanted to breastfeed, either at their own request or at the discretion of the staff, is not known. Nonetheless, after adjusting for socio-demographic characteristics, an attenuation in the association was observed at the second quartile (OR: 2.918, 95% CI: 0.711, 11.983; p-value=0.137), but not at the highest quartile (OR: 2.196, 95% CI: 0.521, 9.247; p-value=0.284). This attenuation further suggests that the paradoxical association was possibly confounded by a number of socio-demographic variables such as educational attainment, since women with a postgraduate education, who were more likely to initiate breastfeed at 48 hours were also the group with the lowest BSES scores.

In relation to BF continuation up to the sixth month, a stepwise association across increasing quartiles of 48 hour-BSES scores was consistently observed at all time-points of investigation. For example, at the first month, compared to the women with the lowest BSES scores, the odds of BF were 2.6-times higher among women in the second quartile ($p<0.01$), 3.1-times higher in the third quartile ($p<0.01$) and nearly 6-times higher in the upper quartile (unadjOR: 5.92, 95% CI: 2.59, 13.52; $p\text{-value}<0.001$). After adjustments, the association attenuated at the upper quartile, but remained statistically significant (adjOR: 3.924, 95%CI: 1.291-11.925; $p\text{-value}=0.016$), while no significant changes were observed in the other quartiles. Similar, or even a slightly stronger association was observed between in-hospital BSES and breastfeeding at the fourth month, with the quartile of women in the upper quartile being more than 4-times more likely to breastfeed after adjusting for socio-demographic and other variables (adjOR: 4.22 95% CI: 1.89, 9.40; $p\text{-value}=0.001$). The association between higher in-hospital BSES and breastfeeding persisted at sixth month, even though the observed pattern did not appear to be gradual as with the previous time-points. For instance, the OR for BF among women at the third quartile (unadjOR= 4.71; 95%

CI: 2.27-9.80; p-value<0.001 and adjOR= 5.07; 95% CI: 2.08-12.36; p-value<0.001) was found to slightly higher than the respective figures in the upper quartile. The odds of women in the upper quartile to be breastfeeding at the six month were still 3.6 to 4-times higher than the women with the lowest in-hospital BSES, and statistically significant (p<0.001)

11.6.3 EBF by BSES at 1st month

Table 11.13 presents the findings from the binary logistic regression analysis performed to investigate the association of maternal BSES, as measured at the first month of followed up, with EBF at the first month and up to the sixth month. The association between BSES at first month and EBF was evident only for mothers in upper quartile of BSES. For example, the odds for EBF among women with the highest BSES scores at the first month were eight and fourteen times greater than women in the lower quartile, at the first and the fourth month respectively (p-value<0.001). Higher odds were also observed among the middle quartiles, but the observed association were not statistically significant. In the adjusted model, even though there was an attenuation in the magnitude of the association, this was still statistically significant with an OR at first month =6.05 (95%CI: 2.08, 17.57, p-value=0.001) and an OR at fourth month =9.54 (95% CI: 1.78, 51.32, p-value=0.007). At the sixth month, none of the mothers in the lowest quartile of BSES scores were EBF. Even though a stepwise increase in the likelihood of mothers to be exclusively breastfeeding at the 6th month was observed, the associations were not statistically significant, possibly to the very low number of women still exclusively breastfeeding at that time-point.

11.6.4 BF by BSES at the 1st month

A stepwise association was evident between first-month BSES scores and BF, and in fact it appeared stronger. Mothers in the upper quartile were as high as 25-times more likely to breastfeed at the fourth month (adjOR: 25.04, 95% CI: 9.8-6.96; p-value<0.001) compared to women in the lowest quartile even after adjustments. There were also 2.5-times and five-times more likely to breastfeed than the mothers in the third and the second quartile respectively. The observed pattern was unchanged after adjustments, (2nd quartile : adjOR:7.056, 95% CI: 2.62-19.01, p-value<0.001; 3rd quartile: adjOR: 15.57, 95% CI: 5.37-45.19, p-value<0.001 and 4th quartile: adjOR: 28.39, 95% CI: 9.23-87.32; p-value<0.001).

Slightly lower, but still statistically significant, were the observed associations across quartiles of increasing BSES scores as measured at the first month with breastfeeding at the sixth month (2nd quartile: adjOR:5.808, 95% CI: 1.95-17.33, p-value=0.002; 3rd quartile: adjOR: 9.81, 95% CI: 3.11-30.92, p-value<0.001 and 4th quartile: adjOR: 21.55, 95% CI: 6.88-67.45; p-value<0.001).

Table 11.11: Odds ratios of EBF at 48hours after birth and at the 1st, 4th and 6th month according to quartiles of participants with increasing Maternal Breastfeeding Self-Efficacy scores measured at 48hours, as estimated in univariable and multivariable logistic models

EBF	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
48 hours				
Lower Quartile	1.00		1.00	
2 nd Quartile	2.060 (0.917, 4.628)	0.080	2.145 (0.790, 5.823)	0.134
3 rd Quartile	2.729 (1.246, 5.979)	0.012	3.101 (1.173, 8.203)	0.023
Upper Quartile	7.888 (3.773, 16.490)	<0.001	9.937 (3.715, 26.577)	<0.001
1st month				
Lower Quartile	1.00		1.00	
2 nd Quartile	1.416 (0.536, 3.738)	0.482	1.518 (0.446, 5.171)	0.504
3 rd Quartile	1.568 (0.603, 4.080)	0.356	2.082 (0.607, 7.146)	0.244
Upper Quartile	3.818 (1.614, 9.030)	0.002	5.308 (1.649, 17.083)	0.005
4th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	2.733 (0.700, 10.665)	0.148	4.122 (0.771, 22.050)	0.098
3 rd Quartile	4.113 (1.105, 15.311)	0.035	4.280 (0.818, 22.392)	0.085
Upper Quartile	8.264 (2.386, 28.627)	0.001	13.662 (2.721, 68.597)	0.001
6th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	1.449 (0.236, 8.887)	0.689	1.768 (0.145, 21.554)	0.655
3 rd Quartile	2.099 (0.374, 11.773)	0.399	1.742 (0.142, 21.367)	0.664
Upper Quartile	4.250 (0.893, 20.237)	0.069	8.895 (0.911, 86.879)	0.060

‡Adjusted for maternal age, educational attainment, marital status, employment status, family income, parity, country of origin, mode of delivery, previous BF Experience; § Adjusted for maternal age, educational attainment, marital status, employment status, family income, parity, country of origin, mode of delivery, previous BF Experience, as well as BF at 48 hours

Table 11.12: Odds ratios of BF at 48hours after birth and at the 1st, 4th and 6th month according to quartiles of participants with increasing Maternal Breastfeeding Self-Efficacy scores measured at 48hours, as estimated in univariable and multivariable logistic models

BF	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)§	p-value
48 hours				
Lower Quartile	1.00		1.00	
2 nd Quartile	5.964 (1.692, 21.017)	0.005	2.918 (0.711, 11.983)	0.137
3 rd Quartile	2.145 (0.883, 5.212)	0.092	1.666 (0.471, 5.895)	0.429
Upper Quartile	2.145 (0.883, 5.212)	0.092	2.196 (0.521, 9.247)	0.284
1st month				
Lower Quartile	1.00		1.00	
2 nd Quartile	2.611 (1.279, 5.332)	0.008	3.179 (1.205, 8.388)	0.019
3 rd Quartile	3.081 (1.476, 6.432)	0.003	3.510 (1.240, 9.935)	0.018
Upper Quartile	5.915 (2.589, 13.517)	<0.001	3.924 (1.291, 11.925)	0.016
4th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	1.853 (0.964, 3.563)	0.064	2.057 (0.958, 4.415)	0.064
3 rd Quartile	3.992 (2.063, 7.723)	<0.001	3.747 (1.660, 8.458)	0.001
Upper Quartile	4.489 (2.374, 8.487)	<0.001	4.220 (1.894, 9.401)	<0.001
6th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	1.778 (0.840, 3.763)	0.133	2.114 (0.883, 5.059)	0.093

BF	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)§	p-value
3 rd Quartile	4.714 (2.269, 9.795)	<0.001	5.144 (2.111, 12.535)	<0.001
Upper Quartile	3.929 (1.925, 8.016)	<0.001	3.641 (1.516, 8.743)	0.004

‡ Adjusted for maternal age, educational attainment, marital status, employment status, family income, country of origin, parity, mode of delivery, previous BF Experience; § Adjusted for maternal age, educational attainment, marital status, employment status, family income, parity, country of origin, mode of delivery, previous BF Experience and BF at 48 hours

Table 11.13: Odds ratios of EBF at the 1st, 4th and 6th month according to quartiles of participants with increasing Maternal Breastfeeding Self-Efficacy scores measured at the first month, as estimated in univariable and multivariable logistic models.

EBF	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)§	p-value
1st month				
Lower Quartile	1.00		1.00	
2 nd Quartile	2.049 (0.765, 5.488)	0.153	1.437 (0.453, 4.558)	0.538
3 rd Quartile	1.676 (0.610, 4.607)	0.317	0.799 (0.224, 2.844)	0.728
Upper Quartile	7.940 (3.199, 19.706)	<0.001	6.047 (2.082, 17.566)	0.001
4th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	5.574 (1.175, 26.446)	0.031	3.605 (0.623, 20.844)	0.152
3 rd Quartile	3.778 (0.756, 18.869)	0.105	2.839 (0.464, 17.374)	0.259
Upper Quartile	14.875 (3.330, 66.447)	<0.001	9.541 (1.774, 51.319)	0.007
6th month‡				
Lower Quartile				
2 nd Quartile	1.00		1.00	
3 rd Quartile	1.269 (0.326, 4.939)	0.731	N/A	
Upper Quartile	2.895 (0.861, 9.732)	0.086	N/A	

Adjusted for maternal age, educational attainment, marital status, employment status, family income, parity, country of origin, mode of delivery, previous BF Experience and BF at 48 hours

Table 11.14: Odds ratios of BF at the 1st, 4th and 6th month according to quartiles of participants with increasing Maternal Breastfeeding Self-Efficacy scores measured at the first month, as estimated in univariable and multivariable logistic models.

BF	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)§	p-value
1st month				
Lower Quartile	1.00		1.00	
2 nd Quartile	3.72 (0.98 14.13)	0.054	18.87 (1.43, 248.56)	0.026
3 rd Quartile	11.48 (1.43, 92.23)	0.022	N/A-	
Upper Quartile	-	-	-	
4th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	5.80 (2.55, 13.151)	<0.001	7.056 (2.62, 19.01)	<0.001
3 rd Quartile	9.48 (4.15, 21.691)	<0.001	15.57 (5.38, 45.19)	<0.001
Upper Quartile	25.04 (9.80, 63.96)	<0.001	28.40 (9.23, 87.33)	<0.001
6th month				
Lower Quartile	1.00		1.00	
2 nd Quartile	4.73 (1.93, 11.61)	<0.001	5.81 (1.95, 17.33)	0.002
3 rd Quartile	6.58 (2.71, 15.99)	<0.001	9.81 (3.11, 30.92)	<0.001
Upper Quartile	18.81 (7.37, 48.02)	<0.001	21.55 (6.88, 67.45)	<0.001

Adjusted for maternal age, educational attainment, marital status, employment status, family income, parity, country of origin, mode of delivery, previous BF Experience and BF at 48 hours

Chapter 12:

“The 10 steps of successful Breastfeeding”

across maternity clinics in Cyprus

One of the aims of this study was to investigate the degree of adherence to the recommended of WHO/UNICEF’s maternity practices, known as “*The 10 Steps for Successful Breastfeeding*”, for promoting and protecting Breastfeeding across maternity care facilities in Cyprus, based on the self-reported experience of the women. The current Chapter presents the mother’s self-reported experience of the 10 Steps as well as the differences in BFSE and the prevalence of BF/EBF according to the implementation of the 10 Steps. Finally, the findings of the association of the implementation of the 10 Steps with BFSE and BF, initiation continuation and exclusivity.

12.1 Mothers’ self-reported experience

The number and percentage of women in the sample reporting experiencing each of the “10 steps” in full, their individual components (where applicable), as well as the International Code of Marketing for Breast Milk Substitutes (ICMBS), are presented in **Table 12.1**. Estimates are presented separately for the overall sample (nationwide) as well as separately by private and public sector, along with a statistical comparison for differences in the self-reported experience according to sector. The Table lists each Step (and components) as defined in the WHO/UNICEF recommendations, and refers to the relevant question used to measure adherence by number as it appears on the relevant WHO/UNICEF questionnaire (**Appendix H**).

Overall, the implementation of the Baby-Friendly 10 Steps across maternity clinics in Cyprus can be described as fragmented (i.e. better for some practices than others) and suboptimal (i.e. generally low across all steps, with very few exceptions). The fragmented implementation of the steps is also evident from the peaks and valleys in **Figures 12.1 and 12.2**, which presents the percentage of mothers responding positively to the implementation of each step. Step 1 (Policy of the clinic) and Step 2 (Continuous education of the maternity clinic staff) also appear on the figure but these are not estimated from the responses of the participating mothers in this study. Questions

on these two steps are not included in the self-assessment questionnaires directed to mothers. Nevertheless, in parallel to this study, a separate study asked the maternity clinic staff to rate these two aspects. In the interest of completeness, these two steps were included in the Figure (but not the Table).

For instance, a high percentage of mothers reported receiving assistance to breastfeed (Step5), holding their baby within one hour (a component of Step 4, not including skin-to-skin) and not receiving any flyers or samples promoting Breast Milk Substitutes (the Code, commonly referred to as the 11th step). Nevertheless, in all other cases, the percentage of women reporting experiencing or implementing any of the other “good practices” is generally below 50%, while for some components considered as critical for the early and successful establishment of breastfeeding (such as skin-to-skin, rooming-in, no use of dummies), the implementation was closer to 20-25%. A more detailed description for each step (and their components) follows in the order of most to least practiced.

With regards to Step 5: Help mothers how to BF and maintain lactation even if they are separated from their infant, operationalized in the questionnaire with two separate questions, the majority of the mothers in the sample reported being asked by maternity clinic staff whether they needed help with breastfeeding (84.6%) as well as receiving practical assistance on infant positioning and attaching on the breast (85.3%). Full implementation of Step 5 (ask if help is needed and offered practical assistance) was reported by 79.2% of the participating mothers, and this was comparable between the private and public sector, with observed differences not statistically significant. In terms of Step 5, the recommended practice also suggests that the maternity clinic staff should show or give mothers information on how they could express milk by hand (i.e. use a breast pump). This was reported by 54.6% of participating mothers.

Slightly lower, but still relatively high by comparison to other practices, was the proportion of mothers who reported that did not receive any flyers or samples that promote BF substitutes (*International Code of Marketing for Breast milk Substitutes* (ICBS) with 75.3%. This finding, however, should be interpreted with caution since data collection in this study took place between 24-48 hours of birth. Anecdotal evidence suggests that company representatives promoting Breast Milk substitutes are more likely to visit mothers upon the third day and just before discharge.

Hence, the fact that the majority of mothers reported not being given any leaflets or samples may simply be a study design effect, rather than an actual representation of the implementation of the ICMBS by the maternity clinics. Significant differences were observed between the public and private sector with a slightly higher percentage of women giving birth in the public sector (80.7%) compared to the private sector (72.2%) reporting implementation of the Code (p -value=0.022).

In relation to Step 4 (*Help Mothers initiate BF within one hour after birth*), 71.3% of the mothers held their newborn within an hour, and 61.9% reported holding their baby within half hour of birth. Nevertheless, no more than 26.1% of mothers reported practicing “*skin-to-skin*” when they first held their infant. No difference between public and private sector with regards to the full implementation of the recommended practice was observed.

Recommended information regarding the recommended frequency (i.e. “every time baby seems hungry, as often as he/she wants”) and duration (i.e. “for as long as the baby wants to”) of breastfeeding was provided to 42.3% and 53.4% of the mothers, respectively (*Step 8: Encourage BF on Demand*). A higher proportion of mothers who gave birth at the public sector reported receiving the appropriate information on the duration of BF, namely 60.4% compared to 49.5% of the mothers who gave birth in the private sector (p -value=0.011). Interestingly, however, the proportion of women reporting full implementation of Step 8 which requires maternity clinic staff to explain that “on demand” refers to both “as often” and “for as long as” the baby wants) were significantly lower and did not exceed 29.5%, with a similar picture across the private and public sector

About half of the participating infants did not receive a pacifier (*Step 9: Give artificial teats or pacifiers to breastfeed infants*). Adherence to Step 9 appeared significantly higher at the public rather than the private sector (65.1% vs 41.2%, p -value<0.001).

In terms of Rooming-in (Step7: Practice Rooming-in –allow mothers and infants to remain together 24 hours a day), this was reported by 33.6% of the mothers, also with a striking difference between the public and the private sector. In the public sector, adherence to *rooming-in* was about three times higher than in the private sector (58.5% vs 19.7%; p -value<0.001).

Information on infant feeding in the prenatal was provided to only 25.3% of the mothers, according to the women’s responses (*Step 3: Inform all pregnant women about the benefits and management of BF*), whereas 32.8% and 25.3% reported that they were provided with specific information on the importance of skin-to-skin and rooming-in, respectively. Mothers who received information on possible adverse effects of providing other liquids than BM in the first six months, including water and BM substitutes, did not exceed 21.8%

A higher proportion of mothers who gave birth in the public sector received information on infant feeding (34.4% vs 20.1%, $p\text{-value}<0.001$), rooming in (34.4% vs 20.1%, $p\text{-value}<0.001$ and skin to skin (40.1% vs 28.6%; $p\text{-value}=0.004$) compared to those in the private sector. The proportion of women reporting that they discuss the adverse effects of providing liquids other than breast milk to their infants did not differ between the sectors (25.0% vs 20.1%, $p\text{-value}=0.164$). Thus, overall, the implementation of step 3 (which is operationalized in the questionnaire with a mix of questions referring to discussing during the prenatal period a woman’s intention to breastfeed and providing specific information about at least three topics: skin-to-skin, rooming-in, and avoiding other liquids) was reported by only 14.2% of participating mothers. Full implementation of Step 3 was generally low, but significantly higher in the public sector with 17.9% compared to the private sector with 12% ($p\text{-value}=0.002$).

With regards to Step 10 (*Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic*), only 26.3% of mothers reported on receiving guidance about seeking help after their exit from the maternity clinic.

Note that Step 6 (“Has your baby been given anything other than breast milk since it was born?”) refers to Exclusive Breastfeeding, and hence it was not included in the Table since this was reported in Chapter 9. The majority of the non exclusively breastfed infants were supplemented with formula (88.7%), while 3.6% and 6.1% were given water/ sugar water and other liquids (such as tea and chamomile), respectively. For the remaining 5.4% infants, mothers were not aware whether their babies received any other liquids except breast milk. Supplementation was provided either because it was requested by the mother (20.7%) or/ and because the infant was not suckling (19.1%) or unsettled (17.9%) or/ and the mother did not have enough milk (17.0%) or for other reasons, ect (25.3%) e.g because of C/S (5.8%) mother had health problems or received medication

(1.9%), baby had severe water loss (0.7%), problems during BF (1.9%). Almost all mothers (87.1%) were informed about the supplementation given to the infant.

Table 12.1: Self-reported experience of the “10 Steps to Successful Breastfeeding” across maternity clinics nationwide and by sector (public Vs private)

STEPS	Question Numbering §	Total % (N)	Public % (N)	Private % (N)	p-value¥
Step 3: Prenatal Information to pregnant women about the benefits and management of BF					
<i>Information on Infant Feeding</i>	2	25.3 (148)	34.4 (73)	20.1 (75)	<0.001
<i>Information on the importance of skin to skin</i>	3.1	32.8 (192)	85 (40.1)	28.6 (107)	0.004
<i>Information on the importance of rooming-in</i>	3.2	25.3 (148)	34.4 (73)	20.1 (75)	<0.001
<i>Information on adverse effects of other liquids than BM</i>	3.3	21.8 (128)	25.0 (53)	20.1 (75)	0.164
<i>Full Implementation</i>		14.2 (83)	17.9 (38)	12.0 (45)	0.002
Step 4: Help mothers to initiate BF within 1 hour after birth					
<i>Holding the infant within an hour after birth</i>	6	71.3 (418)	71.7 (268)	70.8 (150)	0.816
<i>Skin to skin</i>	7	26.1 (153)	26.9 (57)	25.7 (96)	0.747
<i>Full Implementation</i>		22.5 (132)	22.6 (48)	22.5 (84)	0.960
Step 5: Help mothers how to BF and how to maintain BF					
<i>Help provided on how to BF</i>	10	84.6 (496)	83.0 (176)	85.6 (320)	0.412
<i>Help provided on infant positioning and attaching</i>	11	85.3 (500)	85.8 (182)	85.0 (318)	0.787
<i>Full Implementation</i>		79.2 (464)	76.9 (163)	80.5 (301)	0.303
Step 7-Rooming in	13	33.6 (197)	58.5 (124)	19.7 (73)	<0.001

STEPS	Question Numbering §	Total % (N)	Public % (N)	Private % (N)	p-value¥
Step 8: Encourage BF on Demand					
<i>Feeding Frequency</i>	14	42.3 (248)	39.6 (84)	43.9 (164)	0.320
<i>Feeding Duration</i>	15	53.4 (313)	60.4 (128)	49.5 (185)	0.011
<i>Full Implementation</i>		29.5 (173)	29.7 (63)	29.4 (110)	0.938
Step 9: Give no pacifiers or artificial nipples to BF infants	21	49.8 (292)	65.1 (138)	41.2 (154)	<0.001
Step 10: Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic	24	26.3 (154)	24.5 (52)	27.3 (102)	0.468
ICMBS (International Code of Marketing for Breast milk Substitutes)	23	75.3 (441)	80.7 (171)	72.2 (270)	0.022

§Questions’ Numbering was provided as displayed on the WHO/ UNICEF; ¥p-values of chi-square analysis for categorical variables; binary variables of full implementation (no implementation/ full implementation of each maternity practice) were used for the estimation and the comparison of the implementation of the maternity practices between the public and the private sector. Full Implementation of each Step is considered when a mother experiences all components that define the Step as described above

Figure 12.1: Full Implementation of the “10 steps” based on self-reports of participating mothers – overall and by sector.

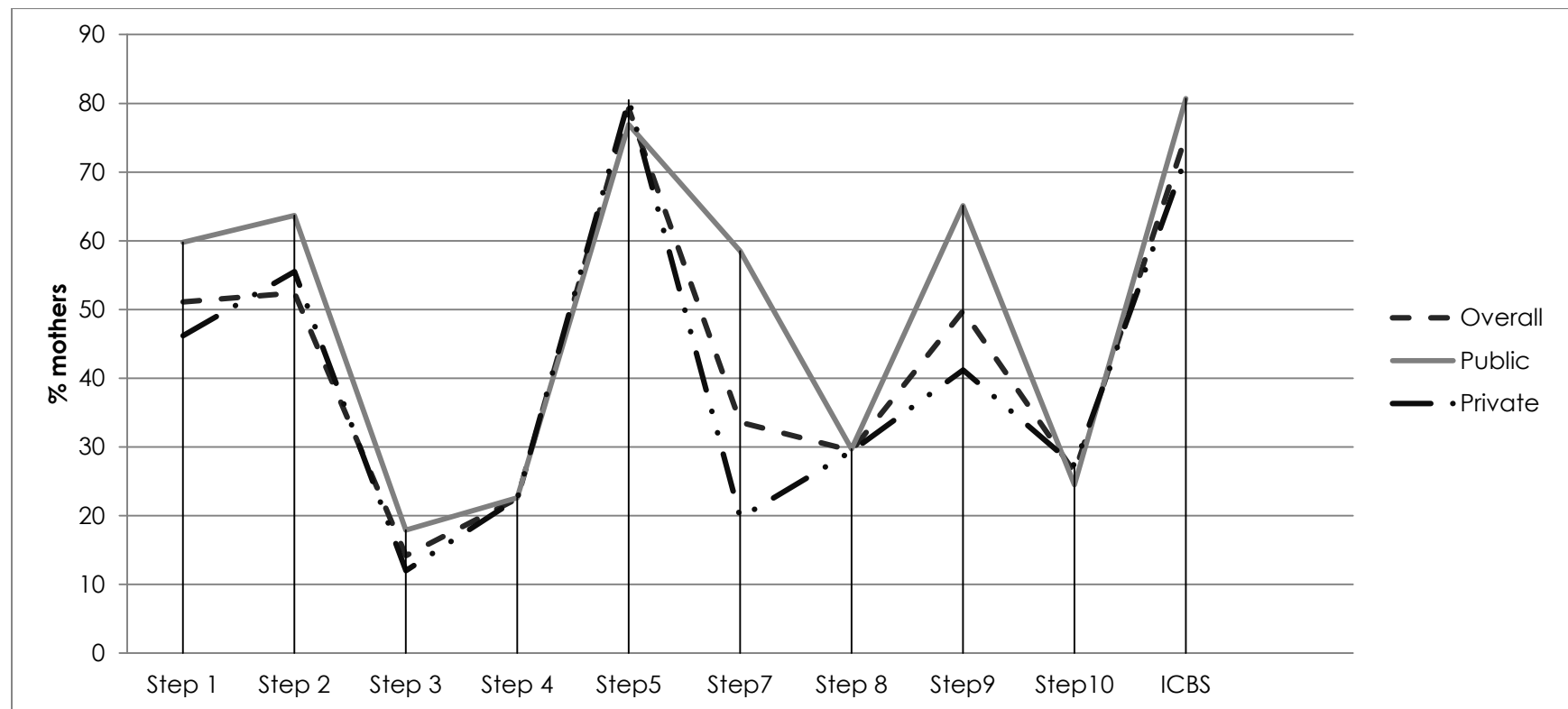
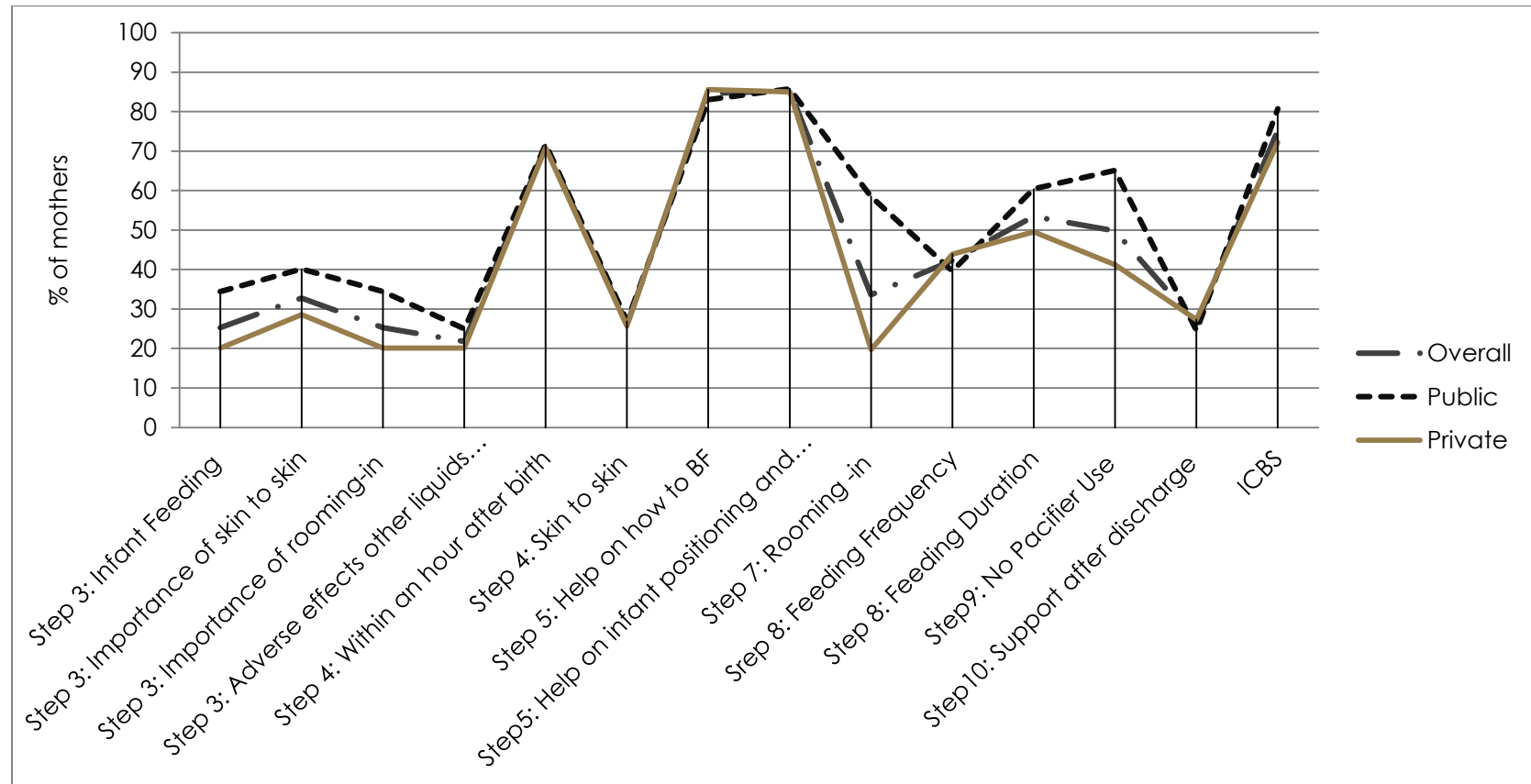


Figure 12.2: Implementation of the segments of the each of the “10 steps” based on self-reports of participating mothers – overall and by sector.



12.2 Differences in BSES according to the “10 steps” experience

Differences in mean BSES scores of the participating mothers, as measured within the first 48 hours and at the first month, according to the self-reported experience of the 10 Steps to successful Breastfeeding are shown on **Table 12.2**. Self-reported experience of most (but not all) of the maternity practices were associated with higher 48-hour BSES scores. Exceptions were the two most-commonly experienced practices, namely, Step 5: receiving practical assistance with BF and the implementation of the ICMBS, which nevertheless were the only two practices reported by the majority of participants (>80%). To some extent, it can be argued that the association between breastfeeding self-efficacy and implementation of the “10 steps” is bi-directional, and a common third variable (intention to breastfeed) is associated with both. That is to say, women who intent to breastfeed (and have higher breastfeeding self-efficacy) are more likely to request or practice the implementation of the “10 steps”, or at least some, such as rooming-in, skin-to-skin etc. However, it is also important to note that observed differences in maternal breastfeeding self-efficacy appear to persist in the long-term. First-month BSES scores also tend to be higher on average among women who responded positively in having experienced or practiced any one of the 10 steps. This suggests that the practice of the “10 steps” itself could have a boosting effect of breastfeeding self-efficacy though the early and successful establishment of breastfeeding while at the clinic, since the effect of intention alone may wane in the longer term.

Significant differences were observed in both 48-hour and first-month BSES scores among mothers who experienced *skin-to-skin* compared to those who did not (48 hours: 3.61 (SD=0.86) vs 3.32 (SD=0.32), p-value=0.001; 1st month: 4.22 (SD=0.78) vs 3.93 (SD=0.76), p-value=0.004). The maternity practice of *holding the baby within the first hour after birth* was also associated, but only moderately, with higher 48- hour as well as first-month BSES scores. When the impact of full implementation of Step 4 was investigated, significant differences on 48-hour BSES score were evident among mothers who experienced both of its components and those who did not experience any of them (3.65 (SD=0.90) vs 3.32 (SD=0.89); p-value=0.001). Full implementation of Step 4 also continues to have an effect on first-month BSES score with 4.25 (SD=0.78) vs 3.94 (SD=0.76); p-value=0.003).

A similar pattern was also observed for Step 8 (*Feeding on demand*). While an association with 48-hour BSES scores was observed with both *Feeding Frequency i.e. any time the baby wants to*

(p-value=0.06) and *Feeding Duration* i.e. for *as long as the baby wants to* (p-value=0.016), it appears that any effect on BSES scores is slightly stronger when both components were implemented, rather than any one of them separately (3.53 (SD=0.86) among those reporting both components vs 3.34 (SD=0.91) among those reporting neither; p-value=0.023). At the first month, the association of BSES with *Feeding Frequency* attenuated (p-value=0.096), while it remained statistically significant for *Feeding Duration* (p-value=0.016). Overall, the effect of full implementation of Step 8 on BSES appears to be strong at the first month (p-value=0.002), and perhaps even stronger compared to the in-hospital BSES (p-value=0.023), possibly suggesting the long-term impact of mastering breastfeeding “on demand”.

Mothers who experienced *rooming-in* had significantly higher in-hospital BSES scores than those who did not. Differences in breastfeeding self-efficacy according to whether rooming-in was practiced while at the clinic were also observed with BSES scores, as measured at the first month. Significantly higher 48-hour BSES scores were also observed among mothers who did *not use pacifier* (Step 9) with 3.53 (SD=0.96) versus 3.28 (SD=0.82) among mothers who used a pacifier with (p-value=0.002). The impact of initiation of in-hospital pacifier use was also apparent on the first-month BSES scores (4.14 (SD=0.79) vs 3.87 (SD=0.73); p-value=0.004). Again, the association might be bi-directional. Use of pacifiers might interfere with the establishment of breastfeeding, and thus, influence maternal breastfeeding self-efficacy. However, the association might also suggest that mothers with lower levels of BSES might be more likely to provide a pacifier to soothe their newborn.

The implementation of Step 3 (information in the prenatal period) appears to be related with 48-hour BSES scores, but not with first-month BSES scores. Mothers who were given information about breastfeeding (full or partial implementation) tend to have higher scores of breastfeeding self-efficacy while at the clinic, compared to those who did not receive any information in the prenatal period those (p-value=0.024). However, no statistically significant difference was observed in first-month BSES scores. In fact, paradoxically, it appears that mothers who reported receiving no information in the prenatal period, are the ones with the highest increase in their breastfeeding self-efficacy scores. Similarly, In relation to Step 10 (advice about help in the community), differences were apparent only for in-hospital BSES scores, but not for 1-month BSES scores. Both of these results might suggest that even women who did not receive any

information about breastfeeding prenatally or advice about seeking help after discharge might have sought information and advice postnatally.

Finally, as already mentioned above, no differences were observed in 48-hour BSES and first month BSES with regards to the implementation of Step 5 (practical assistance) or the ICBS.

Table 12.2: Mean 48 hours and 1-month BSES scores according to the implementation of the 10 Steps

WHO steps for Successful Breastfeeding	N (%)	48 Hours	p-value	N (%)	1 st Month	p-value
		M (SD)			M (SD)	
Step 3: Prenatal Information to pregnant women about the benefits and management of BF						
Not implemented	295	3.31 (0.98)	0.024	175	4.06 (0.74)	0.317
Partial Implementation	136	3.54 (0.75)		71	3.90 (0.83)	
Fully Implemented	73	3.51 (0.76)		38	3.99 (0.86)	
Step 4: Help mothers to initiate BF within 1 hour after birth						
(a) Held the baby within half an hour						
Not implemented	122	3.28 (0.91)	0.092	79	3.88 (0.78)	0.074
Implemented	382	3.44 (0.89)		205	4.06 (0.77)	
(b) Skin to Skin						
Not implemented	365	3.32 (0.32)	0.001	205	3.93 (0.76)	0.004
Implemented	139	3.62 (0.86)		79	4.22 (0.78)	
(c) Both						
Not implemented	383	3.32 (0.89)	0.001	214	3.94 (0.76)	0.003
Implemented	121	3.65 (0.90)		70	4.25 (0.78)	
Step 5: Help mothers how to BF and how to maintain BF						
(a)Help provided on BF						
Not implemented	45	3.40 (0.87)	0.673	40	4.18 (0.73)	0.159
Implemented	459	3.46 (1.15)		244		

WHO steps for Successful Breastfeeding	N (%)	48 Hours	p-value	N (%)	1 st Month	p-value
		M (SD)			M (SD)	
<i>(b) Help provided on Baby positioning and attaching for BF</i>						
Not implemented	39	3.37 (1.22)	0.875	36	3.95 (0.90)	0.621
Implemented	465	3.95 (0.87)		248	4.02(0.76)	
<i>(c) Both</i>						
Not implemented	68	3.40 (1.12)	0.987	54	4.08 (0.79)	0.487
Implemented	436	3.40 (0.86)		230	4.00 (0.78)	
Step 7: Rooming In						
Not implemented	326	3.26 (0.88)	<0.001	178	3.89 (0.78)	<0.001
Implemented	178	3.67 (0.87)		106	4.22 (0.73)	
Step 8:Feeding on demand						
<i>(a) Every time the baby is hungry</i>						
Not implemented	269	3.33 (0.94)	0.060	161	3.95 (0.76)	0.096
Implemented	235	3.48 (0.85)		123	4.10 (0.80)	
<i>(b) As long as the baby wants to</i>						
Not implemented	209	3.33 (0.91)	0.016	125	3.89 (0.82)	0.016
Implemented	295	3.46 (0.89)		159	4.11(0.73)	
<i>(c) Both</i>						
Not implemented	338	3.34 (0.91)	0.023	194	3.92 (0.79)	0.002
Implemented	166	3.53 (0.86)		90	4.22 (0.71)	
Step 9: No pacifier given						

WHO steps for Successful Breastfeeding	N (%)	48 Hours	p-value	N (%)	1 st Month	p-value
		M (SD)			M (SD)	
Not implemented	258	3.28 (0.82)	0.002	132	3.87 (0.73)	0.004
Implemented	246	3.53 (0.96)		152	4.14 (0.79)	
Step 10: Guidance for seeking support						
Not implemented	370	3.33 (0.91)	0.004	212	4.01 (0.76)	0.730
Implemented	134	3.59 (0.84)		72	4.04 (0.82)	
ICBS						
Not implemented	105	3.33 (0.93)	0.354	65	4.12 (0.72)	0.195
Implemented	399	3.42 (0.89)		219	3.98 (0.79)	

12.3 Differences in the prevalence of BF/EBF according to the experience of the “10 steps”

12.3.1 Breastfeeding

Table 12.3 presents the prevalence of breastfeeding initiation and continuation up to the 6th month according to the self-reported experience of the 10 Steps for Successful Breastfeeding.

Implementation of Step 4, either partial or full, appeared to be the most influential on breastfeeding initiation and continuation up to the sixth month. Over 90% of the mothers who either *held their newborn and/or experienced skin to skin* reported of BF initiation during hospital stay. Significantly lower was the proportion of mothers who initiated BF among those who first held their newborn after one hour, at 66.7% (p-value: <0.001) or did not practice skin to skin at 81.5% (p-value= 0.002) or did not experience full implementation of step 4 (early initiation with skin-to-skin) at 81.1% (p-value< 0.001). These differences according to whether Step 4 was practiced were evident with BF continuation up to the sixth month. About half of the mothers who *held their newborn within the first hour after birth* reported breastfeeding at the fourth month compared to 31.5% of those who did not (p-value=0.002).

A striking difference in the prevalence of BF was also recorded at the fourth month with mothers who experienced *skin-to-skin* being more likely to breastfeed (59%) compared to those who did not experienced skin-to-skin at 37.2% (p-value<0.001). Even larger was the difference in the prevalence of BF between mothers who experienced a full implementation of Step 4 (early initiation and skin-to-skin) compared to those who did not report experiencing any of the two components. Specifically, 62.6% of mothers who initiated breastfeeding within one hour with skin-to-skin contact were breastfeeding at the fourth month, which was nearly twice higher than the equivalent figure (37.1%) among those who did not fully experienced step 4 (p-value<0.001). At the sixth month, the prevalence of BF fell to 45.3% among mothers who experienced full implementation of Step 4, but this was still much higher than the 28.6% estimated among those who did not (p-value=0.004).

Among mothers who received *help on BF* or practical assistance on *baby positioning and attaching* (step 5), 91.5% and 91.2% initiated BF. This was about two times higher than those who did not

experienced either of the two components of Step 5 with 44.4% and 44.2%, respectively (p-value <0.001). Differences in the prevalence of BF initiation appeared slightly smaller when both components were considered together. A 92.2% for those experienced full implementation of step 5 vs 54.1% among those who did report any of the two components of Step 5 (p-value<0.001). Again, the association is more likely to be bi-directional as to some extent mothers who intent to breastfeed are more likely to request assistance compared to mothers who decided they would not breastfeed their infants.

At the first month, the prevalence of any BF among mothers who experienced either partial or full implementation of step 5 still appeared higher (Full implementation: 76.1% vs 65.4%, p-value=0.055; *help on positioning and attaching on BF*: 75.8% vs 62.3%, p-value=0.038; *help on BF*: 75.6% vs 65.0%, p-value=0.088) At the fourth month, differences in the prevalence of BF persisted only for those who reported receiving practical assistance on BF positioning and attaching (44.8% vs 32.1%; p-value=0.078). Differences were no longer evident at the sixth month.

More than 91.4% of mothers who experienced rooming-in initiated BF during hospital stay. This was higher by comparison to those who did report rooming-in with 80.7%. The difference was statistically significant (p-value=0.001), even though in terms of its clinical significance, it corresponds to a difference of only one additional mother initiating breastfeeding for every ten mothers rooming-in. This suggests that while mothers who room-in are more likely to breastfeed, the prevalence of breastfeeding initiation was relatively high even among mothers who did not room-in with their infants. Thus, the fact that no association was found between rooming-in and BF continuation during the first six months might not be as surprising.

In contrast, while implementation of *Step 9 (no use of pacifier)* did not appear to relate to initiation of breastfeeding while in the clinic (p-value=0.676), it was associated with the likelihood of longer breastfeeding duration (80.3% vs 67.7% at first month, value=0.005; 49.0% vs 36.4% at the fourth month, p-value=0.016 and 39.9% vs 25.0% at the sixth month, p-value=0.002).

Implementation of Step 8 (advice to breastfeed on demand), either partial or full, was found to be significantly associated with BF initiation with 94.4% versus 76.9% comparing women who do and do not report receiving correct information about feeding frequency (p-value<0.001), 91.7% versus 75.8% comparing women who do and do not report receiving correct information about feeding duration (p-value<0.001) and 93.6% versus 80.4% (p-value<0.001) comparing women

who report receiving correct information about both aspects of “on demand” feeding compared to none. Interestingly, differences in the prevalence of BF within the first six months persisted for women who reported full implementation of step 8, or at least among those reporting receiving the correct advice in terms of feeding frequency (whenever the baby want to), but not in terms of feeding duration (for as long as the baby needs).

An association was also observed between the implementation of the ICMBS as well as Step 10 (advice about seeking help after discharge) with in-hospital BF initiation. Neither of these two aspects, however, seem to be associated with the prevalence of breastfeeding in the longer term.

Finally, no association was found between BF initiation and the implementation of Step 3 (information on BF in the prenatal period). While women who reported receiving information about the benefits and management of BF in the prenatal period appeared slightly more likely to initiate BF while at the clinic, the difference was not statistically significant. Furthermore, the prevalence of breastfeeding in the longer term did not seem to differ according to whether women received information prenatally. In fact, and somewhat paradoxically, women who did not report receiving information, were slightly more likely to continue to breastfeed at the first, fourth and sixth month, even though the observed differences were not statistically significant.

Table 12.3: Prevalence of any breastfeeding initiation and continuation up to the 6th month according to self-reported experience of the “10 steps”.

<i>WHO steps for Successful Breastfeeding</i>	<i>N</i>	<i>48hours % BF (N)</i>	<i>p-value</i>	<i>N</i>	<i>1st month % BF (N)</i>	<i>p- value</i>	<i>N</i>	<i>4th month % BF (N)</i>	<i>p- value</i>	<i>N</i>	<i>6th month % BF (N)</i>	<i>p- value</i>
	N=494				N=274			N=169			N=122	
Step 3: Information on BF prenatally												
Not Implemented	339	82.9 (281)	0.143	219	78.1 (171)	0.080	228	46.9 (107)	0.134	215	35.3 (76)	0.283
Partially Implemented	164	83.5 (137)		103	67.0 (69)		110	35.5 (39)		109	26.6 (29)	
Fully Implemented	83	91.7 (76)		49	69.4 (34)		55	41.8 (23)		52	32.7 (17)	
Step 4: Early initiation of BF												
<i>(a) Held the baby within an hour</i>												
Not implemented	168	66.7 (112)	<0.001	118	63.6 (75)	0.002	124	31.5 (39)	0.002	119	24.4 (29)	0.023
Implemented	418	91.4 (382)		253	78.7 (199)		269	48.3 (130)		257	36.2 (93)	
<i>(b) Skin to Skin</i>												
Not implemented	433	353 (81.5)	0.002	273	72.5 (198)	0.332	288	37.2 (107)	<0.001	276	29.3 (81)	0.033
Implemented	153	92.2 (141)		92	77.5 (76)		105	59.0 (62)		100	41.0(41)	
<i>(c)Both</i>												
Not implemented	454	81.1 (368)	<0.001	287	206 (71.8)	0.092	302	37.1 (112)	<0.001	290	28.6 (83)	0.004

WHO steps for Successful Breastfeeding	N	48hours % BF (N)	p-value	N	1st month % BF (N)	p- value	N	4th month % BF (N)	p- value	N	6th month % BF (N)	p- value
Implemented	132	95.5 (126)		84	81 (0.68)		91	62.6 (57)		86	45.3 (39)	
Step 5: Help provided on BF												
<i>(a) Help provided on BF</i>												
Not implemented	90	44.4 (40)	<0.001	60	39 (65.0)	0.088	63	28 (44.4)	0.801	57	17 (29.8)	0.646
Implemented	496	91.5 (454)		311	235 (75.6)		330	141 (42.7)		319	105 (32.9)	
<i>(b) Help provided on Baby positioning and attaching for BF</i>												
Not implemented	86	44.2 (38)	<0.001	53	62.3 (33)	0.038	56	32.1 (18)	0.076	52	25.0 (13)	0.217
Implemented	500	91.2 (456)		318	75.8 (241)		337	44.8 (151)		324	33.6 (109)	
<i>(c) Both</i>												
Not implemented	122	54.1 (66)	<0.001	78	65.4 (51)	0.055	81	39.5 (32)	0.476	76	26.3 (20)	0.201
Implemented	464	92.2 (428)		293	76.1 (223)		312	43.9 (137)		300	34.0 (102)	
Step 7: Rooming In												
Not implemented	389	80.7 (314)	0.001	236	74.2 (175)	0.863	251	41.0 (103)	0.295	243	30.0 (73)	0.178
Implemented	197	91.4 (180)		135	73.3 (99)		142	46.5 (66)		133	36.8 (49)	
Step 8: Feeding on demand												
<i>(a) Feeding every time the baby is hungry</i>												
Not implemented	338	76.9 (260)		223	70.0 (156)		229	36.2 (83)		221	27.1 (60)	

WHO steps for Successful Breastfeeding	N	48hours % BF (N)	p-value	N	1st month % BF (N)	p- value	N	4th month % BF (N)	p- value	N	6th month % BF (N)	p- value
Implemented	248	94.4 (234)	<0.001	148	79.7 (118)	0.036	164	52.4 (86)	0.001	155	40.0 (62)	0.009
<i>(b) Feeding as long as the baby wants to</i>												
Not implemented	273	75.8 (207)		168	72.6 (122)		181	42.5 (77)		170	30.0 (51)	
Implemented	313	91.7 (287)	<0.001	203	74.9 (152)	0.622	212	43.4 (92)	0.865	206	34.5 (71)	0.357
<i>(c) Both</i>												
Not implemented	413	80.4 (332)		263	70.7 (186)		273	38.5 (105)		294	83.7 (246)	0.676
Implemented	173	93.6 (162)	<0.001	108	81.5 (88)	0.032	120	53.3 (64)	0.006	114	43.0 (49)	0.004
Step 9: No use of pacifier												
Not implemented	294	83.7 (246)	0.676	188	127 (67.6)	0.005	195	36.9 (72)	0.016	188	25.0 (47)	0.002
Implemented	292	84.9 (248)		183	147 (80.3)		198	49.0 (97)		188	39.9 (75)	
Step 10: Guidance for seeking support												
Not implemented	442	81.4 (360)	0.001	279	72.8 (203)	0.403	289	40.1 (116)	0.056	273	30.0 (82)	0.104
Implemented	144	93.1 (134)		92	77.2 (71)		104	51.0 (53)		103	38.8 (40)	
ICBS												
Not implemented	145	69.7 (101)	<0.001	91	68.1 (62)	0.153	102	42.2 (43)	0.841	94	30.9 (29)	0.703
Implemented	441	89.1 (393)		280	75.7 (212)		291	43.3 (126)		282	33.0 (93)	

P-value of chi square analysis for categorical variables

12.3.2 Exclusive Breastfeeding

The prevalence of EBF initiation and continuation to the sixth month on the basis of the self-reported experience of the 10 Steps while at the clinic are presented in **Table 12.4**. In general, the pattern of association between each of the “10 steps” and the likelihood of exclusive breastfeeding observed is similar to that described above in the case of any breastfeeding. However, in the case of exclusive breastfeeding even fewer aspects of the “good maternity” practices were found to be associated with EBF initiation and continuation up to the sixth month.

The prevalence of EBF initiation was significantly higher among mothers who experienced partial or complete implementation of *Step 4* (early contact with baby with skin-to-skin) The proportion of mothers who initiated EBF within the first 48 hours was about 3-4 times higher among those who held their infant within the first hour after birth (23.2%) in comparison to those that did not (7.7%; p-value <0.001). In relation of skin-to-skin, 32.7% among those who report holding their baby skin-to-skin, breastfeeding their baby exclusively in the clinic, which was about 2 times higher than those who did not (13.9%; p-value <0.001). The difference was more striking for full implementation of *Step 4* since as many as 37.1% versus 13.7% of women reported breastfeeding their baby exclusively while at the clinic (p-value <0.001).

This difference in the likelihood to be breastfeeding exclusively persisted in the case of *skin-to-skin* and in the case of full implementation of *Step 4* up to the sixth month. Mothers who experienced skin-to-skin were consistently about two to three times as likely to be breastfeeding exclusively in the longer term compared to those who did not (1st month: 28.6% vs 13.2%, p-value <0.001; 4th month: 22.5% vs 8.6%, p-value <0.001; 6th month: 10.0% vs 3.3% p-value=0.006). The differences were even stronger when full implementation of step 4 was considered (1st month: 33.3% vs 12.5%, p-value =0.001; 4th month: 26.3% vs 8.1%, p-value <0.001; 6th month: 10.6% vs 3.4% p-value=0.005).

EBF initiation was also associated with good advice in terms of *Feeding Frequency* (“any time the baby wants to”) and full implementation of *Step 8 (Feeding on Demand)*, but not with good advice with regards to *Feeding Duration* alone (“as long as the baby wants to”). Any effect on “good advice” with regards to feeding on demand was evident only at the first month. Beyond that, the

prevalence of women exclusively feeding their infants at fourth and sixth month did not differ according to whether the reported being given advice on feeding on demand while at the clinic.

In relation to rooming-in, women who practiced it were three times more likely to be exclusively breastfeeding while at the clinic (34.0% vs 11.1; $p\text{-value}<0.001$). However, any association between rooming-in and exclusive breastfeeding was restricted to the first 48 hours, as was the case with any breastfeeding. The likelihood of women exclusively breastfeeding in the longer term did not differ according to whether they roomed-in with their infants while at the clinic.

In contrast, and again similarly to the case of any breastfeeding, Step 9 (no use of pacifiers) appears to have a positive association with EBF initiation as well as its continuation up to the sixth month. While at the clinic, women who did not report using pacifiers, were nearly three times more likely to exclusively breastfeed (27.4% Vs 10.2; $p\text{-value}<0.001$). Similarly, women who did not report using pacifiers while at the clinic, were at least twice as likely to be exclusively breastfeeding at the first, fourth and sixth month (in all cases $p\text{-value}<0.01$).

Finally, no association was found between exclusive breastfeeding and Step 3 (information on breastfeeding in the prenatal period), Step 5 (offered practical assistance), Step 10 (advice on seeking help in the community) and the implementation of the ICMBS.

Table 12.4: Prevalence of exclusive breastfeeding initiation and continuation up to the 6th month according to self-reported experience of the “10 steps”.

<i>WHO steps for Successful Breastfeeding</i>	<i>N</i>	<i>48hours % (N)</i>	<i>p- value§</i>	<i>N</i>	<i>1st month % (N)</i>	<i>p- value §</i>	<i>N</i>	<i>4th month % (N)</i>	<i>p- value§</i>	<i>N</i>	<i>6th month % (N)</i>	<i>p- value§</i>
	N=110			N=64			N=51			N=21		
Step 3: Information on BF prenatally												
Not Implemented	339	18.3 (63)	0.252	219	19.6 (43)	0.343	244	13.4 (34)	0.465	256	5.7 (14)	0.735
Partially Implemented	164	22.0 (36)		103	13.6 (14)		115	9.6 (11)		116	4.3 (5)	
Fully Implemented	83	13.3 (12)		49	14.3 (7)		56	10.7 (6)		56	3.6 (2)	
Step 4: Early initiation of BF												
(a) Held the baby within an hour												
Not Implemented	168	7.7 (13)	<0.001	118	13.6 (16)	0.199	130	7.7 (10)	0.054	132	4.5 (6)	0.755
Implemented	418	23.2 (97)		253	19.0 (48)		285	14.4 (41)		285	5.3 (15)	
(b) Skin to Skin												
Not Implemented	433	13.9 (60)	<0.001	273	13.2 (36)	0.001	304	8.6 (26)	<0.001	307	3.3 (10)	0.006
Implemented	153	32.7 (50)		98	28.6 (28)		111	22.5 (25)		110	10.0 (11)	
(c) Both												
Not Implemented	454	13.4 (61)	<0.001	287	12.5 (36)	<0.001	320	8.1 (26)	<0.001	323	3.4 (11)	0.005

<i>WHO steps for Successful Breastfeeding</i>	<i>N</i>	<i>48hours % (N)</i>	<i>p-value§</i>	<i>N</i>	<i>1st month % (N)</i>	<i>p-value §</i>	<i>N</i>	<i>4th month % (N)</i>	<i>p-value§</i>	<i>N</i>	<i>6th month % (N)</i>	<i>p-value§</i>
Implemented	132	37.1 (49)		84	33.3 (28)		95	26.3 (25)		94	10.6 (10)	
Step 5: Help provided on BF												
<i>(a) Help provided on BF</i>												
Not Implemented	90	21.1 (19)	0.537	60	18.3 (11)	0.808	67	17.9 (12)	0.126	67	4.5 (3)	0.820
Implemented	496	18.3 (91)		311	17.0 (53)		348	11.2 (39)		350	5.1 (18)	
<i>(b) Help provided on Baby positioning and attaching for BF</i>												
Not Implemented	86	16.3 (14)	0.522	53	20.8 (11)	0.466	60	16.7 (10)	0.264	60	6.7 (4)	0.532
Implemented	500	19.2 (96)		318	16.7 (53)		355	41 (11.5)		357	7.8 (17)	
<i>(c) Both</i>												
Not Implemented	122	20.5 (25)	0.584	78	17.9 (14)	0.854	87	14.9 (13)	0.396	87	4.6 (4)	0.834
Implemented	464	18.3 (85)		293	17.1 (50)		328	11.6 (38)		330	5.2 (17)	
Step 7: Rooming In												
Not Implemented	389	43 (11.1)	<0.001	236	16.5 (39)	0.625	267	11.6 (31)	0.572	270	4.1 (11)	0.223
Implemented	197	67 (34.0)		135	18.5 (25)		148	13.5 (20)		147	6.8 (10)	
Step 8: Feeding on demand												
<i>(a) Feeding every time the baby is hungry</i>												
Not Implemented	338	15.4 (52)	0.014	223	30 (13.5)	0.017	247	25 (10.1)	0.103	249	13 (5.2)	0.834

<i>WHO steps for Successful Breastfeeding</i>	<i>N</i>	<i>48hours % (N)</i>	<i>p-value§</i>	<i>N</i>	<i>1st month % (N)</i>	<i>p-value §</i>	<i>N</i>	<i>4th month % (N)</i>	<i>p-value§</i>	<i>N</i>	<i>6th month % (N)</i>	<i>p-value§</i>
Implemented	248	23.4 (58)		148	34 (23.0)		168	26 (15.5)		168	8 (4.8)	
<i>(b)Feeding as long as the baby wants to</i>												
Not Implemented	273	16.1 (44)	0.124	168	16.1 (27)	0.584	189	21 (11.1)	0.504	189	3.7 (7)	0.257
Implemented	313	21.1 (66)		203	18.2 (37)		226	13.3 (30)		228	6.1 (14)	
<i>(c) Both</i>												
Not Implemented	413	15.5 (64)	0.002	263	14.4 (38)	0.026	293	10.9 (32)	0.188	294	4.8 (14)	0.692
Implemented	173	26.6 (46)		108	24.1 (26)		122	15.6 (19)		123	5.7 (7)	
Step 9: No use of pacifiers												
Not Implemented	294	10.2 (30)	<0.001	188	8.0 (15)	<0.001	209	8.6 (18)	0.022	210	2.4 (5)	0.013
Implemented	292	27.4 (80)		183	26.8 (49)		206	33 (16.0)		207	7.7 (16)	
Step 10: Guidance for seeking support												
Not Implemented	442	18.1 (80)	0.466	279	18.6 (52)	0.218	304	12.2 (37)	0.903	304	5.6 (17)	0.394
Implemented	144	20.8 (30)		92	13.0 (12)		111	12.6 (14)		113	3.5 (4)	
ICBS												
Not Implemented	145	14.5 (21)	0.127	91	17.6 (16)	0.923	109	13.8 (15)	0.586	111	7.2 (8)	0.222
Implemented	441	20.2 (89)		280	17.1 (48)		306	11.8 (36)		306	4.2 (13)	

§p-value of Chi square analysis

12.4 Association of the 10 Steps to Successful Breastfeeding with breastfeeding and exclusive breastfeeding

A binary logistic regression model was performed in order to quantify the magnitude of association between each of the “10 steps” with exclusive or any breastfeeding at 48 hours and in the longer term. Furthermore, in order to identify the set of “10 steps” which are more predictive of the likelihood a mother will initiate exclusive or any breastfeeding while at the clinic, when mutually adjusting for each other, and similarly the likelihood that a mother will still be breastfeeding up to the sixth month, a stepwise regression model was employed. **Tables 12.6** and **12.8** present the OR (95% CI) estimates of these models. To assist interpretation, in the case of the unadjusted models only estimates for the variables which were retained in the stepwise models are presented.

12.4.1 Exclusive breastfeeding

A positive association was observed between EBF initiation and Step 4 (partial or full implementation). Mothers who experienced partial implementation (held the baby within one hour or practiced skin-to-skin) were about two times more likely to initiate EBF (unadjOR=2.14 95% CI: 1.09, 4.15; p-value= 0.025). Full implementation of both components of Step 4 appeared to have an even stronger association with EBF initiation with unadjOR= 6.64 (95% CI:3.34, 13.21; p-value= <0.001). In a stepwise regression model, including all components of the “10 Steps to Successful Breastfeeding” mutually adjusting for each other, step 4 remained predictive of the likelihood of exclusive breastfeeding. However, a decrease in the odds was observed, and the association was statistically significant only for full implementation with adjOR= 5.56 (95% CI: 2.67, 11.57; p-value= <0.001), but not for partial implementation (adjOR= 1.87, 95% CI: 0.93, 3.74; p-value= 0.079). The association with full, but not partial, implementation, of Step 4 was still evident at the first month (adjOR: 2.42; 95% CI: 1.18, 4.98, p-value=0.016) and at the fourth month. Specifically, women who reported full implementation of step 4 were more than 5-times more likely to be exclusively breastfeeding at the fourth month (adjOR: 5.56, 95% CI: 2.25, 13.73; p-value<0.001).

Similarly, the implementation of Step 9 (no use of pacifiers) was positively associated with EBF initiation, as well as continuation of exclusive breastfeeding. Mothers who practiced Step 9 during hospital stay appear about two times more likely to initiate exclusive breastfeeding and about 3-4 times more likely to continue EBF in the longer term. For instance, mothers who did not use pacifiers while at the clinic were 3.44-times (95% 1.23, 9.56) more likely to be exclusively breastfeeding at the sixth month.

On the other hand, rooming-in appears to be associated with EBF initiation (unadjOR: 4.15, 95% CI: 2.69, 6.39; p-value<0.001 and adjOR: 3.28, 95% CI: 2.05, 5.25; p-value<0.001), but not with the likelihood that a mother will continue exclusively breastfeeding in the longer term.

Interestingly, while an association was observed between Step 3 (information on the benefits and management of breastfeeding in the prenatal period) and EBF initiation (unadjOR=2.24, 95% CI 0.98, 5.11; p-value=0.055) before considering the other variables, this association reversed in the adjusted models (which retain step4: early contact with skin-to-skin, step 7: rooming-in and step 9: no use of pacifiers as the most predictive of EBF initiation). It is not entirely clear what might explain the reversal of the association (adjOR=0.34, 95% CI 0.16, 0.75) once the most predictive variables are included in the model. Since the variable refers to information being given in the prenatal period, it may suggest that among women who practiced skin-to-skin, rooming-in and use no pacifiers, it is the ones who did not attend prenatal classes (where such information is more likely to have been provided) who were more likely to initiate exclusively breastfeeding.

Overall, it seems that the only two variables which more consistently predict the likelihood of a mother to exclusively breastfeed in the longer term, are step 4 (and especially skin-to-skin) and step 9 (no use of pacifiers). In contrast, information about breastfeeding in the prenatal period and rooming-in only appear to independently predict EBF initiation, and not continuation.

As expected, when the regression model was repeated to include Step 6 (no liquids given to the infant while at the clinic) on continuation of exclusive breastfeeding, it was found that this was the strongest predictor of EBF continuation up to the sixth month. However, no changes were observed in terms of the estimates of association with the other steps suggesting that step 4 and step 9 are independent predictors of EBF continuation up to the sixth month – results not shown in detail.

Table 12.6: *Unadjusted Odds Ratio of the association of EBF at 48 hours and up to the sixth month with to the implementation of the 10 Steps*

	48 hours		1 st month		4 th month		6 th month	
	UnadjOR (95% CI)	p-value	UnadjOR (95% CI)	p-value	UnadjOR (95% CI)	p-value	UnadjOR (95% CI)	p-value
Step 3: Information on BF prenatally								
None	1.00		1.00		1.00		1.00	
Partial	1.23 (0.78, 1.95)	0.374	0.64 (0.34, 1.24)	0.188	0.65 (0.32, 1.34)	0.246	0.74(0.26, 2.12)	0.578
Full	0.67 (0.34, 1.34)	0.255	0.68 (0.29, 1.62)	0.387	0.74 (0.30, 1.86)	0.524	0.61 (0.14, 2.77)	0.523
Step 4: Early initiation of BF								
None	1.00		1.00		1.00		1.00	
Partial	2.14 (1.10, 4.15)	0.025	0.68 (0.33, 1.37)	0.275	0.88 (0.38, 1.99)	0.753	0.66 (0.20, 2.22)	0.505
Full	6.64 (3.34, 13.21)	<0.001	2.75 (1.34, 5.54)	0.005	3.71 (1.68, 8.21)	0.001	2.64 (0.87, 8.02)	0.086
Step 5: Help provided on BF								
None	1.00		1.00		1.00		1.00	
Partial	1.92 (0.76, 4.86)	0.170	0.55 (0.17, 1.76)	0.312	0.32 (0.09, 1.14)	0.078	0.27 (0.03, 2.69)	0.263
Full	1.29 (0.59, 2.83)	0.526	0.69 (0.30, 1.62)	0.398	0.45 (0.20, 1.02)	0.056	0.67 (0.19, 2.39)	0.538
Step 7: Rooming In								
No	1.00		1.00		1.00		1.00	
Yes	4.15 (2.69, 6.39)	<0.001	1.15 (0.66, 1.99)	0.625	1.19 (0.65, 2.17)	0.295	1.72 (0.71, 4.15)	0.228
Step 8: Feeding on demand								
None	1.00		1.00		1.00		1.00	
Partial	0.91 (0.53, 1.55)	0.720	0.94 (0.47, 1.87)	0.859	1.26 (0.60, 2.63)	0.545	1.30 (0.44, 3.83)	0.639

	48 hours		1 st month		4 th month		6 th month	
	UnadjOR (95% CI)	p- value	UnadjOR (95% CI)	p-value	UnadjOR (95% CI)	p-value	UnadjOR (95% CI)	p-value
Full	1.88 (1.13, 3.12)	0.015	1.82 (0.94, 3.51)	0.074	1.70 (0.81, 3.55)	0.159	1.39 (0.45, 4.25)	0.566
Step 9: No Use of a Pacifier								
None	1.00		1.00		1.00		1.00	
Full	3.32 (2.10, 5.24)	<0.001	4.22 (2.27, 7.85)	<0.001	2.02 (1.10, 3.73)	0.023	3.44 (1.23, 9.56)	0.018
Step 10: Guidance for seeking support								
No	1.00		1.00		1.00		1.00	
Yes	1.19 (0.75, 1.90)	0.466	0.66 (0.33, 1.29)	0.221	1.04 (0.54, 2.01)	0.903	0.62 (0.20, 1.88)	0.398
ICBS								
No	1.00		1.00		1.00		1.00	
Yes	1.49 (0.89, 2.51)	0.129	0.97 (0.52, 1.81)	0.923	0.84 (0.44, 1.60)	0.836	0.57 (0.23, 1.42)	0.227

Table 12.8: Stepwise Logistic Binary Regression Analysis of EBF at 48 hours and up to the sixth month with regards to the implementation of the 10 Steps

	48 hours		1st month		4 th month		6 th month	
	AdjOR (95% CI)	p-value	AdjOR(95% CI)	p-value	AdjOR (95% CI)	p-value	AdjOR (95% CI)	p-value
Step 3: Information on BF prenatally								
None	1.00							
Partial	1.11 (0.66, 1.85)	0.693						
Full	0.34 (0.16, 0.75)	0.007						
Step 4: Early initiation of BF								
None	1.00		1.00		1.00			
Partial	1.87 (0.93, 3.74)	0.079	0.72 (0.35, 1.49)	0.374	1.24 (0.51, 3.06)	0.636		
Full	5.56 (2.67, 11.57)	<0.001	2.42 (1.18, 4.98)	0.016	5.56 (2.25, 13.74)	0.001		
Step 5: Help provided on BF								
None					1.00			
Partial					0.23 (0.06, 0.87)	0.030		
Full					0.27 (0.10, 0.69)	0.006		
Step 7: Rooming In								
No	1.00							
Yes	3.28 (2.05, 5.25)	<0.001						
Step 9: No Use of a Pacifier								
No	1.00		1.00				1.00	
Yes	2.51 (1.54, 4.10)	<0.001	3.69 (1.96, 6.94)	<0.001			3.44 (1.23, 9.56)	0.018
Variables mutually adjusted								

12.4.2 Breastfeeding

Table 12.7 shows the stepwise regression models for the association between BF at 48 hours as well as at the first, fourth and sixth months with self-reported experience of the “10 steps”.

Implementation of Step 5 (practical assistance with breastfeeding) appeared to have the greatest effect on BF initiation than any other step both before and after considering all others in a stepwise model. Mother who experienced either partial, or even more so full, implementation of this step were 13-40 times more likely to initiate BF (unadjOR: 13.50 95% CI: 5.66, 32.23, p-value<0.001 at partial implementation and unadjOR: 41.61 95% CI: 20.13, 86.01, p-value<0.001). A decrease in the effect estimate was observed when other covariates were considered, but it still remained the step with the strongest association with BF initiation (adjOR: 10.68, 95% CI: 3.88, 29.40, p-value<0.001 at partial implementation and adjOR: 25.40, 95% CI: 10.76, 59.96, p-value<0.001). Nevertheless, this is not surprising, since it only suggests that women who decided they would not breastfeed at all, were simply not offered assistance by the maternity clinic staff. Based on the findings reported in the previous section, practical assistance with BF by the maternity clinic staff was only predicting that a woman will initiate breastfeeding, and not whether she will exclusively breastfeed, as no association was observed between step 5 and EBF.

On the other hand, as with the case of exclusive breastfeeding, implementation of Step 4 (partial or full) was positively associated with BF initiation as well as continuation. Mothers who experienced one of the two components of Step 4 were about four times more likely to initiate BF (unadjOR: 3.88 (95% CI: 2.38, 6.32, p-value<0.001). After considering the other variables, there was an attenuation in the odds of BF initiation among mothers who experienced either of the two components of step 4, but it remained highly predictive of the likelihood that a mother would initiate breastfeeding. Mothers who experienced any (but not both) of the two components were 2.56-times more likely to breastfeed (95% CI: 1.39, 4.74, p-value=0.003). Full implementation of Step 4 (i.e. holding baby within one hour and practicing skin-to-skin) was associated with at least a ten-fold increase in the likelihood to breastfeed (unadjOR: 10.825 95% CI: 4.458 26.287, p-value<0.001). Even though this association attenuated, after considering other covariates, it remained highly predictive of breastfeeding and statistically significant (adjOR: 5.78, 95% CI: 2.12, 15.80, p-value<0.001). The practice of early contact with the baby, and specifically when

this was at skin-to-skin position, was also one of the most predictive variables of the likelihood a mother would breastfeed in the longer term. Mothers who reported skin-to-skin within the first hour were at least 2-3 times to breastfeed at the first (unadjOR: 2.35 95% CI: 1.19, 4.62, p-value=0.013; adjOR: 2.154 95% CI: 1.085, 4.273, p-value=0.028) and the fourth month (unadjOR: 3.74, 95% CI: 2.09, 6.74, p-value<0.001; adjOR: 2.79, 95% CI: 1.31, 5.93, p-value<0.001), even though no association was observed at the sixth month .

Implementation of Step 8 (advice on how to breastfeed on demand), whether reported as partially or fully implemented by the participating mothers, also appeared to be associated with BF initiation with adjOR: 2.68 (95% CI: 1.38, 5.22; p-value=0.004) and adjOR: 3.03 (95% CI: 1.04, 6.61; p-value=0.005) respectively. While being advised to BF on demand did not seem to predict whether a woman would be breastfeeding at the first and fourth month, it appears that this was more predictive whether a women would be breastfeeding at the sixth month, even more so than step 4 (which was more predictive of breastfeeding behaviour at the first and fourth month). Specifically, the only variables that were predictive of breastfeeding at the sixth month were step 8 along with step 9 (no pacifiers). Women who reported full implementation being more likely to be breastfeeding at the sixth month (adjOR: 1.77, 95% CI: 1.03, 3.03, p-value=0.038)

In relation to Step 9 (no pacifiers), mothers who did not report using them at the clinic were about two times more likely to initiate breastfeeding as well as continue to breastfeed. In fact, similarly, to breastfeeding on demand, the use of pacifiers was more predictive than other variables of whether a woman would be still breastfeeding at the sixth month. No significant differences in the ORs were observed before and after adjusting for the other steps, which suggests that the practice of not using pacifiers is an independent predictor of BF continuation.

Finally, a positive association was found between the implementation of ICBS and BF initiation (unadjOR: 3.57, 95% CI: 2.24, 5.67, p-value<0.001; adjOR: 2.95 95% CI: 1.60, 5.43, p-value=0.001). Nevertheless, this did not predict whether a woman would be breastfeeding in the longer term.

Overall, it appears that steps 4 (early contact with skin-to-skin), 8 (advice by the staff to BF on demand), 9 (no use of pacifiers) are more predictive of whether a woman will initiate breastfeeding. Step 5 (practical assistance) is added to this list of strong predictors, even though, as discussed above, this is more likely to be an artefact as a result of the fact that no assistance

would be expected to be provided to women who express the wish not to breastfeed. Furthermore, the implementation of the Code appears to be an independent predictor of breastfeeding initiation, however this does not seem to be predictive of longer-term breastfeeding behaviour. Among these variables, only three steps (4, 8 and 9) in some combination appeared to be more consistently predictive of the likelihood a mother would be breastfeeding at the first, fourth and sixth month.

Table 12.5: *Unadjsted Odds Ratio of the association of BF at 48 hours and up to the sixth month with to the implementation of the 10 Steps*

	48 hours		1 st month		4 th month		6 th month	
	UnadjOR	p-value	UnadjOR	p-value	UnadjOR	p-value	UnadjOR	p-value
	(95% CI)		(95% CI)		(95% CI)		(95% CI)	
Step 3: Information on BF prenatally								
None	1.00		1.00		1.00		1.00	
Partial	1.04 (0.64, 1.73)	0.856	0.57 (0.34, 0.96)	0.034	0.62 (0.39, 0.99)	0.047	0.66 (0.34, 1.10)	0.113
Full	2.24 (0.98, 5.11)	0.055	0.64 (0.32, 1.26)	0.197	0.81 (0.45, 1.47)	0.495	0.89 (0.47, 1.69)	0.718
Step 4: Early initiation of BF								
None	1.00		1.00		1.00		1.00	
Partial	3.88 (2.38, 6.32)	<0.001	1.75 (1.03, 2.85)	0.038	1.53 (0.93, 2.51)	0.093	1.25 (0.73, 2.15)	0.410
Full	10.83 (4.46, 26.29)	<0.001	2.35(1.19, 4.62)	0.013	3.75 (2.09, 6.74)	<0.001	2.40 (1.30, 4.41)	0.005
Step 5: Help provided on BF								
None	1.00		1.00		1.00		1.00	
Partial	13.50 (5.66, 32.23)	<0.001	1.538 (0.60, 3.93)	0.368	1.23 (0.50, 3.02)	0.645	0.70 (0.25, 1.94)	0.490
Full	41.61 (20.13, 86.01)	<0.001	2.12 (1.03, 4.40)	0.042	1.34 (0.67, 2.69)	0.407	1.19 (0.54, 2.58)	0.670
Step 7: Rooming In								
No	1.00		1.00		1.00		1.00	
Yes	2.53 (1.45, 4.42)	0.001	0.96 (0.59, 1.55)	0.863	1.25(0.82, 1.89)	0.295	1.36 (0.87, 2.12)	0.179
Step 8: Feeding on demand								
None	1.00		1.00		1.00		1.00	
Partial	5.11 (2.90, 9.01)	<0.001	0.90 (0.53, 1.53)	0.689	0.87 (0.53, 1.41)	0.867	0.86 (0.50, 1.47)	0.571
Full	6.87 (3.48, 13.57)	<0.001	1.72 (0.93, 3.20)	0.086	1.70 (1.04, 2.80)	0.035	1.81 (1.06, 3.07)	0.029

	48 hours		1st month		4th month		6th month	
	UnadjOR	p-value	UnadjOR	p-value	UnadjOR	p-value	UnadjOR	p-value
	(95% CI)		(95% CI)		(95% CI)		(95% CI)	
Step 9: No use of pacifier								
No	1.00		1.00		1.00		1.00	
Yes	1.10 (0.70, 1.72)	0.676	1.96 (1.22, 3.16)	0.005	1.64 (1.10, 2.45)	0.016	1.99 (1.28., 3.09)	0.002
Step 10: Guidance for seeking support								
No	1.00		1.00		1.00		1.00	
Yes	3.05 (1.54, 6.06)	0.001	1.27 (0.73, 2.20)	0.404	1.55 (0.99, 2.43)	0.057	1.48 (0.92, 2.37)	0.105
ICBS								
No	1.00		1.00		1.00		1.00	
Yes	3.57 (2.24, 5.67)	<0.001	1.46(0.87, 2.45)	0.154	1.05 (0.66, 1.65)	0.841	1.10(0.67, 1.82)	0.703

Table 12.6: Stepwise Logistic Binary Regression Analysis of BF at 48 hours and up to the sixth month with regards to the implementation of the 10 Steps

	48 hours		1 st month		4 th month		6 th month	
	AdjOR (95% CI)	p-value	AdjOR (95% CI)	p-value	AdjOR (95% CI)	p-value	AdjOR (95% CI)	p-value
Step 4: Early initiation of BF								
None	1.00		1.00		1.00			
Partial	2.56 (1.37, 4.74)	0.003	1.84 (1.08, 3.14)	0.025	1.53(0.93, 2.51)	0.093		
Full	5.78 (2.12, 15.80)	0.001	2.15 (1.09, 4.27)	0.028	3.75(2.09, 6.73)	<0.001		
Step 5: Help provided on BF								
None	1.00							
Partial	10.68 (3.88, 29.40)	<0.001						
Full	25.40 (10.76, 59.96)	<0.001						
Step 8: Feeding on demand								
None	1.00						1.00	
Partial	2.68 (1.38, 5.22)	0.004					0.82 (0.47, 1.42)	0.479
Full	3.03 (1.39, 6.61)	0.005					1.77 (1.03, 3.03)	0.038
Step 9: No use of pacifier								
No	1.00		1.00				1.00	
Yes	1.87 (1.01, 3.49)	0.047	1.95 (1.20, 3.16)	0.007			2.01 (1.28, 3.14)	0.002
ICBS								
No								
Yes	2.95 (1.60, 5.43)	0.001						

Variables mutually adjusted

12.5 Association between the 10 Steps to Successful Breastfeeding and BSES at 48 hours and first month

A stepwise linear regression analysis was used to explore the association between the self-reported experience of the 10 Steps with either in-hospital and first month BSES. The results are presented in **Table 12.9**.

Rooming-in was the strongest predictor of in-hospital BSES. Specifically, mothers who practiced rooming-in had a higher mean BSES score by 0.414 (95% CI 0.253, 0.574, p -value<0.001) before adjustment and by 0.384 (95% CI: 0.224, 0.544; p -value<0.001) after considering other predictors. The observed association between rooming-in and breastfeeding self-efficacy, however, attenuated by the first month. The first-month BSES scores were still higher on average among women who practiced rooming-in while at the clinic, and the observed difference was still statistically significant (adj β =0.263, 95% CI: 0.077, 0.449; p -value=0.006). This is consistent with the observation reported in the previous section that rooming-in was predictive of whether a women would breastfeed exclusively while at the clinic. However, rooming-in did not predict whether she would still be breastfeeding exclusively, or breastfeed at all in the longer term.

In relation to Step 4, in-hospital BSES scores were higher by 0.232 units on average among mothers who experienced full implementation (held baby within one hour and skin-to-skin), compared to mothers who did not (95% CI: 0.052-0.413, p -value=0.012). Implementation of Step 10 (advice on seeking help in the community) also appeared to be predictive of in-hospital maternal breastfeeding self-efficacy with adj β =0.229 (95% CI: 0.055, 0.402; p -value=0.010). Nevertheless, step 4 does not seem to be associated with breastfeeding self-efficacy in the longer term.

In contrast, implementation of Steps 8 (advice to BF on demand) and 9 (no use of pacifiers) appear to have a longer-term, rather than an immediate, impact on BSES. While neither of these steps were predictive of maternal breastfeeding self-efficacy at 48 hours, they were the only predictive variables of the maternal breastfeeding self-efficacy at the first month, along with rooming-in. Specifically, the first-month BSES scores were higher among mothers who responded positively to Step 8 (unadj β =0.316, 95% CI: 0.098, 0.534; p -value=0.005 and adj β =0.290 95% CI: 0.103, 0.477, p -value=0.002) and to Step 9 (unadj β =0.263 95% CI: 0.084, 0.443; p -value=0.004 and adj β =0.202 95% CI: 0.025, 0.379, p -value=0.005) compared to those who did not. Interestingly, a

negative association was found between step 3 (information in the prenatal period) and first month BSES with $\text{adj}\beta = -0.225$ (95% CI: -0.427, -0.023; $p\text{-value} = 0.029$). Even though it is hard to interpret this association, it would suggest that maternal breastfeeding self-efficacy tends to be higher at the first month among women that did not discuss the benefits and management of breastfeeding with maternity care staff in the prenatal period. One hypothesis about how this result might arise is if women with lower breastfeeding self-efficacy are the ones who are more likely to attend prenatal classes or are more likely to be the ones who bring up the subject of breastfeeding with their doctor or midwife during a consultation in the prenatal period. Even though worries about being unsuccessful with breastfeeding might explain this, there is no way to test this hypothesis. Nevertheless, this finding is consistent with the observation that the minority of women (about one in three) who reported discussing the benefits and management of breastfeeding with their doctor or midwife in the prenatal period (either at consultations or in prenatal classes) were more likely to initiate exclusive breastfeeding while at the clinic, but not necessarily continue to exclusively breastfeed while at home. In fact, as reported earlier, once the most predictive variables of exclusive breastfeeding initiation were considered (skin-to-skin, rooming-in and use no pacifiers), an inverse association was observed between step 3 and exclusive breastfeeding.

In brief, only step 4, step 7 and step 10 were predictive of maternal breastfeeding self-efficacy while at the clinic. Of these, only step 7 was also predictive of maternal breastfeeding self-efficacy at the first month, even though steps 8 and 9 were also predictive of breastfeeding self-efficacy at the first month, irrespective of the fact that these experiences did not seem to have an impact on breastfeeding self-efficacy while at the clinic. Among these variables, only three steps (4, 8 and 9) in some combination appeared to be more consistently predictive of the likelihood a mother would be breastfeeding at the first, fourth and sixth month it is not clear whether it is also. Even though all the association observed are statistically significant, they represent a small-to-moderate difference on the BSES scale, and hence it is not clear whether they would be clinically significant.

Table 12.9: Stepwise Linear Regression Analysis of 48-hour and first month BSES according to the implementation of the 10 Steps.

BSES at 48 hours					BSES at 1 st month			
	Unadjusted B (95% CI)	p-value	Adjusted B (95% CI)	p-value	Unadjusted B (95% CI)	p-value	Adjusted B (95% CI)	p-value
Step 3: Information on BF prenatally								
Partial					-0.16 (-0.38, 0.05)	0.134		
Full					-0.08 (-0.35, 0.18)	0.580	-0.23 (-0.43, -0.02)	0.029
Step 4: Early initiation of BF								
Partial	-0.09 (-0.29, 0.11)	0.377						
Full	0.30 (0.11, 0.49)	0.002	0.23 (0.05, 0.41)	0.012				
Step 5: Help provided on BF								
Partial								
Full								
Step 7	0.41 (0.25, 0.57)	<0.001	0.38 (0.22, 0.54)	<0.001	0.33 (0.15, 0.52)	<0.001	0.30 (0.12, 0.48)	0.002
Step 8								
Partial					0.03 (-0.19, 0.24)	0.82		
Full					0.32 (0.10, 0.53)	0.005	0.29 (0.10, 0.48)	0.002
Step 9					0.26 (0.08, 0.44)	0.004	0.20 (0.03, 0.38)	0.025
Step 10	0.26 (0.09, 0.44)	0.004	0.23 (0.06, 0.40)	0.010				
ICBS								
Variables mutually adjusted								

Chapter 13:

Infant care social support and workplace BF support

In addition to main aim of this thesis, which pertained to exploring the inter-relationship between the “10 steps”, breastfeeding self-efficacy and breastfeeding initiation and continuation up to the 6th month, a secondary aim of the study was to provide a description of the perceived **Infant Care Social Support** as well as the perceived **workplace breastfeeding** support among women in Cyprus. This chapter presents the findings with regards to this aim.

13.1 Metric properties of the scales

13.1.1 Workplace BF Support Scale

13.1.1.1 Reliability

Cronbach’s alpha of the Workplace BF Support scale was found to be acceptable with 0.761 and similar to the original scale ($\alpha = 0.77$; Bai *et al.* 2008). There was no change by 0.1 in the alpha if any of the items were removed from the scale. The item mean was 3.92 with a range of values between 1.26 and 6.17. The item variance was also on average 3.62, ranging from 1.22-6.65. The inter-item correlations were moderate to rather low. 0.198 (Range: -0.132, 0.485).

13.1.1.2 Construct Validity

The KMO value of sampling adequacy was 0.799, which is well above the value of 0.6 considered for the performance of an acceptable principal component analysis. Principal component analysis of extraction with an eigenvalue of 1.0 and varimax rotation identified three factors that accounted for 51.05% of the total variance. The scree plot also suggested three factors. These seem to tap on perceived social support of breastfeeding at the workplace in relation to peer support (4 items), breastfeeding-friendly environment with technical support (5 items) and facility support (3 items). The first factor accounted for the largest proportion of variance with 28.38%.

The original study (Bai *et al.* 2008) suggested four dimensions of 3 items each: peer support, environmental support, technical support and facility support. In contrast to the original scale, the

dimensionality of the scale was not as clear. While peer support (all the items which refer to co-workers) and facility support (breast pump, designated room for pumping, and on-site day care facility) included all three items as expected based on the original scale, the separation of environmental and technical support was not as clear. One of the environmental support items tapped on the peer support dimension (one additional item) and the other two on the technical support dimension. Specifically, mothers perceived that the statement “I have supportive coworkers who cover for me when I need to pump my milk” represents peer support rather than environmental support (as in the original scale). This is not unexpected since this particular item also directly refers to co-workers. Similarly, the other two statements in the environmental support, namely “breastfeeding is common at my workplace” and “I have a supportive supervisor” were not extracted as a separate scale, but had high factor loadings on the same factors as the three items of “technical support” (refrigerator, quiet place other than the bathroom to pump breast milk, refrigerator to store milk and taking breaks).

Table 13.1: Principal Component Analysis for the WBSS

	Component 1	Component 2	Component 3
My co-workers agree that breastfeeding is better for baby's health than formula feeding.	0.674		
I have supportive co-workers who would cover for me if I needed to pump my milk.	0.692		
My co-workers would not make fun of me if I would sometimes leak milk through my clothes.	0.643		
Breastfeeding is common in my workplace.		0.526	
I have a breastfeeding supportive supervisor		0.575	
My co-workers listen to me talk about my breastfeeding experience.	0.700		
I would feel comfortable taking several breaks during work hours to pump breast milk.		0.561	
In my workplace, there is a designated space (nursing room) to nurse my baby or pump breast milk.			0.756
I could easily find a quiet place other than the bathroom at my work to pump breast milk.		0.561	
My workplace has a refrigerator that I could use to store my milk.		0.707	
My workplace has a breast pump for nursing mothers to use			0.601
My workplace has an on-site daycare.			0.745

13.1.2 Perceived Infant Care Social Support Scale**13.1.2.1 Reliability**

Reliability of the PICSS was assessed as high with a Cronbach's $\alpha=0.901$. Removing any of the items did not result in a higher α , while the observed decrease in the α coefficient did not exceed 0.1 if any one of the items were removed. The item mean was 3.10 (range: 2.15-3.44) with a mean variance of 0.86 (range: 0.55- 1.35). The average of the inter-item correlations was 0.30, and these range from 0.01 to 0.81.

13.1.2.2 Construct Validity

Construct validity was assessed by conducting a factor analysis of the PICSS. The KMO measure of adequacy was 0.91 and Bartlett's Test of Sphericity was significant ($p\text{-value} < 0.001$); thus, both indicators suggesting that the data were appropriate for factor analysis. Initially, the default eigenvalue of 1.0 was used to identify the number of factors to extract. In contrast to the original scale (of four factors), exploratory factor analysis with a principal components extraction method and a varimax rotation yielded five factors with a clear structure, even though a number of differences were observed compared to the original scale, accounting for 65.87% of the total variance. As with the original scale, the identified factors referred to perceived social support with infant care in relation to instrumental support (split into two components), informational support (split into two components) and emotional /appraisal support (which were considered as one dimension in contrast to the original scale).

In contrast to the original scale, the informational social support aspect tapped on two distinct components - informational support for infant care (for example, "I can get information on changing/dressing the baby" and the other three stated activities) and personal maternal care (for example, "I can get information on taking care of my body after child birth" and "I can learn for other mothers' experiences"). Similarly, the instrumental social support aspect tapped on two distinct components – instrumental household support (expressed with items, such as "I have someone to help me with routine housework" and "I won't be on my own taking care of my baby") and instrumental support with direct care of the infant (such as "I can get hands-on help with my baby, in terms of four stated activities).

Nevertheless, the dimensionality of the scale was clear, and supported its use. For consistency with published literature, the instrumental and informational sub-scales were combined, while in terms of the emotional and appraisal aspects of social support, both separate sub-scale scores (as in the original scale) as well as a combined emotional/appraisal social support score were calculated.

Table 13.2:*Principal component analysis of the PICSS scale*

Items	Component 1	Component 2	Component 3	Component 4	Component 5
I can get information on					
Feeding		0.795			
Changing/ dressing		0.883			
Bathing		0.859			
Comfort/settling		0.712			
I can get information on taking care of my body after child birth					0.746
I can learn from other mothers' experiences					0.677
I can get consistent information regarding infant care		0.641			
I can get 'hands on help' with my baby:					
Feeding			0.829		
Changing/ Dressing			0.879		
Bathing			0.873		
Comfort/ settling			0.786		
I have someone to help me with routine housework				0.720	
I won't be on my own taking care of my baby				0.589	
I can make time for myself				0.663	
I have people to count on things go wrong	0.690				
I have someone to care and comfort me	0.661				
I have someone to talk about how I feel	0.810				
If I need advice there is someone who will assist me	0.789				
I have people to talk to and share experiences with	0.770				
I have people who will show me appreciation for the care I give to my baby	0.779				

People close to me understand that it is okay for me to need help	0.671

I can get positive feedback from health care professionals about my ability to care for my baby	0.383

13.2 Perceived Infant Care Social Support

Table 13.3 presents the descriptive statistics of the functional component of the PICSS scale. Overall scores as well as separate score for the four sub-scales that constitute perceived infant care social support, and an additional combined emotional and appraisal social support scale are presented.

Overall, the PICSS mean score was 3.10 (SD=0.53; Range: 1.41-4.00, on a 1-4 response scale) and the median was 3.14. It can be described as *high to very high*. With regards to the separate dimensions of social support, emotional social support had the highest mean of 3.36 (SD=0.66; Range: 1.00-4.00), closely followed by appraisal support with a mean score of 3.32 (SD=0.61; Range: 1.25-4.00). Informational support was slightly lower with a mean score of 3.11 (SD=0.64; Range: 1.00-4.00). Instrumental social support had the lowest mean by far among the four dimensions of infant care social support with 2.81 (SD=0.57; Range: 1.00-4.00), representing levels of at least 0.5 to 1 SD lower than the lowest and highest respectively of the other three dimensions.

Table 13.3: *Descriptive statistics of Functional Perceived Infant Care Social Support (PICSS)*

	Total	Dimensions of Functional Perceived Infant Care Social Support				
	Overall	Informational SS	Instrumental SS	Emotional SS	Appraisal SS	Emotional & Appraisal SS
Mean (SD)	3.10 (0.53)	3.11 (0.64)	2.81 (0.57)	3.36 (0.66)	3.32 (0.61)	3.34 (0.61)
Median	3.14	3.14	2.83	3.50	3.50	3.50
Max	4.00	4.00	4.00	4.00	4.00	4.00
Min	1.41	1.00	1.00	1.00	1.25	1.13
95% CI	3.04-3.15	3.04-3.17	2.73-2.88	3.25-3.38	3.25-3.38	3.27-3.40

13.3 Workplace Breastfeeding Social Support

Mean Workplace BF Social Support score was found to be moderate (Mean=3.91, SD=1.00, on a 1-7 response scale). In relation to the four components of the scale, peer support had by far the highest mean score with 5.67 (SD=1.32), followed by environmental support (M=4.34, SD=1.44). Mean score of Facility and Technical support was much lower than the other two components with 2.74 (SD=0.99) and 2.92 (SD=1.62), respectively.

Table 13.4: *Descriptive Characteristics of Workplace Breastfeeding Social Support Scale*

	Total	Components of Workplace Social Support			
		Peer	Environmental	Facility	Technical
Mean (SD)	3.91 (1.00)	5.67 (1.32)	4.34 (1.44)	2.74 (0.99)	2.92 (1.62)
Median	4.00	6.00	4.33	2.67	3.00
Max	6.00	7.00	7.00	7.00	7.00
Min	1.50	1.00	1.00	1.00	1.00
95% CI	3.80, 4.04	5.50, 5.83	4.16, 4.52	2.72, 3.12	2.62, 2.86
Scale			1-7		

¥ Number of mothers that completed the Workplace Breastfeeding Support Scale (WBSS): 254

13.4 Comparison of infant care social support and workplace breastfeeding social support by BF status

13.4.1 Perceived Infant Care Social Support

Table 13.5 presents a comparison of overall functional PICSS score and PICSS sub-scales scores by EBF and BF status on the 4th and 6th month. In general, no significant differences in overall infant care social score were observed according to BF and EBF status. In relation to the four components of functional social support, a difference was observed only in relation to instrumental support. Specifically, breastfeeding mothers had slightly lower mean scores of perceived instrumental social support at the fourth month (when social support was measured), compared to mothers who were not breastfeeding, and this difference was statistically significant. This difference was evident at the sixth month, even though it was no longer statistically significant. Differences in instrumental social support were much more evident among women who exclusively breastfed, compared to the rest (which now includes women who might breastfeed, but not exclusively). These were statistically significant both at the fourth as well as at the sixth month. While in general the availability of social support would be considered a promoting factor for breastfeeding, this finding might suggest a conflict between the wishes of the mother to breastfeed, and even more so to exclusively breastfeed, and the level of instrumental support that is available to accommodate those wishes, expressed as in a form of a complain. It is of note that a difference in the perceived level of social support in the care of the infant between breastfeeding and non-breastfeeding mothers concerns only the dimension of instrumental support.

13.4.2 Workplace Breastfeeding Support

Table 13.6 presents the overall mean workplace breastfeeding support score as well as the sub-scale scores according to EBF and BF status at the fourth and the sixth month. In general, mean overall and sub-scale WBSS scores were slightly higher among women who were breastfeeding compared to those who did not; however, none of the observed differences were statistically significant.

Table 13.5: Total Mean PICSS score and Mean Social Support by Dimension according to BF and EBF status

<i>BF Status</i>	N	Total	p-value	Informational	p-value	Instrumental	p-value	Emotional	p-value	Appraisal	p-value
<i>At 4th month</i>											
No	208	3.13 (0.52)	0.171	3.12 (0.64)	0.662	2.88 (0.78)	0.037	3.12 (0.64)	0.670	3.37 (0.67)	0.740
Yes	168	3.05 (0.53)		3.08 (0.63)		2.71 (0.74)		3.09 (0.63)		3.35 (0.66)	
<i>At 6th month</i>											
No	235	3.12 (0.53)	0.215	3.10 (0.64)	0.880	2.86 (0.80)	0.103	3.37 (0.67)	0.436	3.34 (0.60)	0.236
Yes	119	3.04 (0.53)		3.09 (0.62)		2.72 (0.70)		3.32 (0.66)		3.26 (0.66)	
<i>EBF Status</i>											
<i>At 4th month</i>											
No	326	3.11 (0.52)	0.128	3.12 (0.63)	0.404	2.84 (0.76)	0.020	3.37 (0.65)	0.664	3.32 (0.61)	0.888
Yes	50	2.99 (0.59)		3.03 (0.69)		2.57 (0.75)		3.33 (0.75)		3.31 (0.67)	
<i>At 6th month</i>											
No	352	3.11 (0.52)	0.109	3.12 (0.63)	0.104	2.84 (0.75)	0.007	3.36 (0.66)	0.346	3.32 (0.61)	0.783
Yes	21	2.92 (0.52)		2.89 (0.76)		2.37 (0.80)		3.50 (0.60)		3.36 (0.67)	

Table 13.6: Total Mean Workplace Social Support Score and by Dimension according to BF and EBF status at 4th and 6th month, respectively

BF status	N	Overall	p-value	Peer	p-value	Environm.	p-value	Facility	p-value	Techn.	p-value
At 4th month											
No	241	3.91 (0.99)	0.575	5.66 (1.32)	0.614	4.32 (1.43)	0.460	2.92 (1.61)	0.870	2.73 (0.99)	0.805
Yes	12	4.07 (1.12)		5.86 (1.33)		4.64 (1.54)		3.00 (1.93)		2.81 (0.95)	
At 6th month											
No	164	3.92 (0.98)	0.969	5.76 (1.28)	0.142	4.25 (1.38)	0.194	2.90 (1.63)	0.725	2.75 (1.00)	0.735
Yes	89	3.92 (1.03)		5.51 (1.38)		4.50 (1.54)		2.97 (1.63)		2.71 (0.97)	
EBF status											
At 4th month											
No	214	3.91 (1.01)	0.691	5.70 (1.33)	0.342	4.30 (1.44)	0.289	2.94 (1.61)	0.872	2.69 (1.00)	0.107
Yes	36	3.98 (0.98)		5.47 (1.33)		4.58 (1.45)		2.89 (1.74)		2.98 (0.95)	
At 6th month											
No	241	3.91 (1.00)	0.585	5.66 (1.33)	0.614	4.32 (1.43)	0.501	2.92 (1.61)	0.870	2.73(0.99)	0.805
Yes	12	4.08 (1.12)		5.86 (1.34)		4.64 (1.54)		3.00 (1.93)		2.81 (0.95)	

13.5 Sources of Perceived Infant Care Social Support

Table 13.7 presents the sources of perceived social support during the first fourth months after birth. With the exception of informational support, the husband or partner was the main source of support in the care of the infant. This is closely followed by the maternal grandmother. The smallest difference between husband/ partner and maternal grandmother was observed in terms of the instrumental dimension of support, while the largest was observed in terms of appraisal support. Only about one in three women also nominated the paternal grandmother as a source of any type of support. In fact, interestingly, more women nominate their father as a source of emotional and appraisal support than the grandmother-in-law. Siblings and friends were also nominated as sources of informational, emotional or appraisal social support (but not instrumental), but by only one in 3-4 women. Only 1.8% of women report that nannies/house keepers were a source of instrumental support.

In terms of informational social support, the majority of the mothers reported pediatricians as the main source with 73.1%. Only a small percentage of mothers nominated any other health professional as a source of information social support, with the highest percentage being midwives/nurses with 18.8%. The second source of information social support grandmothers with 68.9%. Interestingly, only 25.1% of the women nominated their husband/partner as a source of informational support, which is as low as the percentage of mothers nominating grandmothers-in-law (27.4%) and friends (23.5%). Among the sources of informational social support, neighbours (1.6%), grandfather (8.1%) and grandfathers-in-law (4.4%) ranked at the lowest position. In relation with formal support, gynecologists and other health professionals did not exceed 6.2% and 2.6%, respectively.

Instrumental support was mainly provided from fathers (68.9%) and grandmothers (67.6%). Third in rank were grandmothers-in-law with only 29.2%. Emotional and appraisal support was mainly provided by family members. Fathers were the main source of emotional support and appraisal with 85.9% and 81.2%, respectively, followed by their own mother and father. Only 8.4% and 14.6% of mothers respectively reported that pediatricians are a source of emotional or appraisal support, while reference to any other health professionals does not exceed 2%.

Table 13.7: Sources of Lay and Professional Social Support in the Care of the Infant up the fourth month.

	Informational	Instrumental	Emotional	Appraisal
	N (%)	N (%)	N (%)	N (%)
<i>Family and Friends</i>				
Husband/ Partner	96 (25.1)	264 (68.9)	329 (85.9)	311 (81.2)
Mother	264 (68.9)	259 (67.6)	270 (70.4)	239 (62.4)
Father	31 (8.1)	39 (10.2)	144 (37.6)	142 (37.1)
Mother –in-Law/ Partner’s Mother	105 (27.4)	112 (29.2)	128 (33.4)	131 (34.2)
Father-in- Law/ Partner’s Father	17 (4.4)	12 (3.1)	82 (21.4)	86 (22.5)
Nanny/ House Keeper	4 (1.0)	7 (1.8)	1 (0.3)	1 (0.3)
Brothers/ Sisters	63 (16.4)	46 (12.0)	112 (29.2)	91 (23.8)
Friends	90 (23.5)	8 (2.1)	76 (19.8)	77 (20.1)
Neighbours	6 (1.6)	0 (0.0)	6 (1.6)	5 (0.3)
Others	23 (6.0)	19 (5.0)	22 (5.7)	19 (5.0)
<i>Heath Professionals</i>				
Midwives/ Nurses	72 (18.8)	4 (1.0)	8 (2.1)	5 (0.3)
Pediatrician	280 (73.1)	12 (3.1)	32 (8.4)	56 (14.6)
Gynecologist	24 (6.2)	1 (0.3)	4 (1.0)	3 (0.78)
Other Health Professionals	10 (2.6)	1 (0.3)	0 (0.0)	1 (0.3)

Chapter 14:

Discussion

14.1 Introduction

The beneficial health effects of breastfeeding on both infant as well as maternal health are well documented. These were discussed in **Chapter 1** of this thesis. By the end of the 70s, the dramatic reduction in the prevalence of BF worldwide, had led the WHO and UNICEF to recognize breastfeeding as a public health priority. The following decades, a number of international initiatives for the promotion and protection of breastfeeding had been established, as discussed in **Chapter 3**. These include the development of a number of policies and strategies, such as the “Baby-Friendly Hospital” and the “10 steps for successful breastfeeding”, as well as the enactment of legislations for the support and protection of BF, such as the International Code for the Marketing of BreastMilk Substitutes. In fact, the adoption of the Code is still referred to as an example of a new approach in public health, since it was in essence the response to a call by the Infant Formula Action Coalition during the 70s for a consumer boycott of Nestle products. These attempts contributed to the increase of the prevalence of breastfeeding in many developed countries (Victora *et al.* 2016; Bagci Bosi *et al* 2015; CDC; 2016). However, as presented in **Chapter 2**, evidence suggests that premature EBF and BF discontinuation is still common and the WHO recommendations of exclusive breastfeeding for the first six months is not the norm. In fact, most countries fall short of the WHO target for 50% of infants 0-6 months to be exclusively breastfeeding by 2025 (WHO, 2014), even in the developing world (Victora *et al.* 2016).

The need to tackle the low BF rates and plan interventions to promote exclusivity and/or longer duration of breastfeeding requires the understanding of the factors that influence breastfeeding behavior. The socio-ecological model provides a framework for a holistic understanding of these influences on BF practices. Beyond the intrapersonal level factors, such as maternal health literacy and breastfeeding self-efficacy, practical difficulties (Odom *et al.* 2013), misconceptions with regards to infant feeding such as perception with regards to insufficient milk (Synnott *et al.* 2007),

influences from the immediate social environment as well as the lack of supportive clinic-level policies have all been associated with BF outcomes (Hannula *et al.* 2008).

Evidence on the prevalence and determinants of BF and EBF in Cyprus is very limited. The little evidence that there is suggests that EBF rates are very low even from the first 48 hours (MoH, 2010; 2015; Isaia *et al.* 2017). In fact, according to EuroPerinatal Survey (2010), Cyprus ranks amongst the lowest positions in terms of the initiation of exclusive breastfeeding at 48 hours. However, these estimates are outdated by nearly a decade. The only estimates of breastfeeding beyond the 48 hours come from a recently published study (Isaia *et al.* 2017) which reported that nine out of ten women initiate breastfeeding while at the clinic (93%) and that the prevalence of BF falls gradually to 37.5% by the six month. However, other than the small sample size (N=128) and retrospective nature of the study (mothers of infants 6-18 months), these estimates are based only on Greek-speaking mothers who visited a public-sector healthcare centre for vaccination in the urban area of Nicosia.

The purpose of this study was to provide first-time estimates of the prevalence of breastfeeding and exclusive breastfeeding beyond 48 hours and up to the sixth month of an infant's life by prospectively following a representative sample of women who gave birth in a maternity clinic in Cyprus, operating either in the public or the private sector, which accounts for as many as 70% of the annual volume of births. Furthermore, the study described the socio-demographic and other determinants of exclusivity and duration of breastfeeding, with a focus on maternal breastfeeding self-efficacy and the self-reported degree of implementation of the “10 steps for successful breastfeeding” across maternity clinics in Cyprus.

14.2 Summary of main findings

The main findings are summarized below in terms of the specific objectives set out in this study

14.2.1 Prevalence and Determinants of Breastfeeding and Exclusive Breastfeeding

While breastfeeding initiation appeared high, premature discontinuation of breastfeeding was observed with the highest reduction after the first and before the fourth month. By the 6th month, only one in three mothers was still breastfeeding. The prevalence of exclusively breastfeeding was

low even at 48 hours (18.8%) while by the sixth month only 5% of the mothers were still breastfeeding exclusively. For primiparas and those who gave birth by C/S, lower rates of initiation, exclusivity and duration of breastfeeding were observed. In addition, there was evidence of a social gradient with mothers of higher socioeconomic position being more likely to breastfeeding, to breastfeed exclusively (particularly those with higher educational attainment) and to breastfeed longer.

14.2.2 Maternal Breastfeeding Self-Efficacy

Breastfeeding self-efficacy was only moderate, and even lower among primiparas, those who delivered by caesarian section and those who did not experience good practices while at the clinic on the basis of the WHO's "10 steps". While higher levels of self-efficacy were not associated with the likelihood of breastfeeding initiation, there was a clear stepwise association between self-efficacy and exclusivity. For instance, the quartile of mothers with the highest levels of self-efficacy at 48 hours were five times more likely to breastfeed exclusively (40.5% Vs 7.9% among those with the lowest levels). Furthermore, the association between self-efficacy and EBF persisted at the 1st (OR= 3.8 95% CI 1.61-9.03), 4th (OR=8.3 95% CI 2.39-28.63) and 6th (OR=4.3 95% CI 0.89-20.24) month, even after adjusting for socio-demographic characteristics including type of delivery, parity and social position. Similar if not even stronger associations were observed between the prevalence of BF/EBF and self-efficacy as reported at the 1st month. Thus, this study showed that, against a generally low prevalence of breastfeeding among Cypriot mothers, low self-efficacy in the early period is associated with non-exclusivity and earlier discontinuation of breastfeeding.

14.2.3 The 10 Steps for Successful Breastfeeding

In terms of the "10 steps for successful breastfeeding", the study showed that implementation was sub-optimal and fragmented across maternity clinics in Cyprus based on the self-reported experience of the mothers. In fact, some of the least practiced "steps" appear to be the strongest predictors of BF and EBF while at the clinic as well as in the long run. For instance, the strongest predictors of exclusive breastfeeding while at the clinic were holding the baby within one hour, no use of pacifiers (reported by 49.8%% of mothers), skin-to-skin (reported by 26.1%), rooming-in (reported by 33.6%) and receiving information about breastfeeding in the prenatal period (reported

by 35%). In particular, mothers who practiced skin-to-skin and did not use pacifiers appeared two to six and three times more likely to EBF in the long term, respectively, after mutually adjusted as well as adjusted for the other Steps. Of course, it should be noted that the experience of BF-friendly practices may to some extent be attributed to the intention of mothers to exclusively breastfeed.

14.2.4 Infant Care Social Support and Workplace Breastfeeding Social Support

Finally, perceived social support in the care of the infant was moderate among women giving birth in Cyprus, with lower levels recorded in terms of instrumental support. For all dimensions, a social gradient was apparent in favor of mothers of higher socioeconomic position, even though differences were statistically significant only with regards to instrumental and emotional support. The partner was the main source of instrumental, emotional and appraisal support (68-86%), followed by maternal grandmothers (62.4-70.4%) with less than a third naming any other person. In terms of informational support, pediatricians ranked first (73.1%) closely followed by grandmothers (68.9%), with less than a quarter listing the partner, other health professionals, other family members or friends. While peer and environmental support in the workplace were moderate, workplaces were not rated as breastfeeding friendly in terms of facilities and technical support.

14.3 Prevalence of BF and EBF up to the sixth month

The present study estimated the prevalence of BF and EBF for the first time amongst a representative nationwide sample of women who gave birth in a maternity clinic in Cyprus. While breastfeeding initiation appeared high, premature discontinuation was observed with the highest reduction after the first and before the fourth month. By the 6th month, only one in three mothers was still breastfeeding. The prevalence of exclusively breastfeeding was low even at 48 hours (18.8%), while by the sixth month only 5% of the mothers were still breastfeeding exclusively.

While EBF initiation rates appeared slightly higher across maternity wards of public hospitals compared to clinics in the private sector (as aggregate estimates), no differences were observed in terms of EBF continuation rates. Furthermore, no significant differences were observed in BF initiation and continuation rates up to the fourth month between the public and private sector. Nonetheless, a smoother drop in the prevalence of breastfeeding was recorded after the fourth

month among mothers who gave birth in the public sector compared to the private sector. The extent to which this could be attributed to the different socio-demographic profile of the users of the public and private sectors is not clear.

Compared to previously reported official statistics, the findings would suggest that no significant changes have occurred during the last decade in terms of exclusivity across maternity clinics in the public sector. While the estimated figure of 23.6% reported in this study appears slightly improved compared to the 16% reported over a decade ago (MoH, 2010), it is comparable to, if not slightly lower than, the latest official statistic reported for public maternity wards by the Ministry of Health (28.1%; MoH, 2015). No data on BF initiation and exclusivity have been reported, up to date, for the private sector; thus, a direct comparison is not possible.

In terms of the five districts of the island, the prevalence of EBF initiation ranged from 6.3% in Larnaca to 33.3% in Ammochostos. At six months, the prevalence of EBF ranged from 0.0% in Paphos to 10.5% in Limassol. In terms of any breastfeeding, significant differences were also observed across districts, with only 17.1% of mothers breastfeeding in Ammochostos at the sixth month to 39.9% in Nicosia.

In a recently published study (Isaia *et al.* 2017) amongst mothers visiting health centres for vaccination in Nicosia, the prevalence of BF and EBF initiation was reported to be 93% (vs 88.4% in this study) and 36.7% (vs 19.5% in this study). Nevertheless, it should be noted that the particular study based its estimates on retrospective self-reports of mothers when the child was over six months old, and hence, it may have overestimated the true prevalence, especially in the case of exclusive breastfeeding. In fact, in terms of BF continuation, the estimates reported were comparable to the estimates found in this study (1st month: 81.3% vs 82.2%; 4th month: 49.2% vs 48.0% and 6th month: 37.5% vs 39.9%). In relation to EBF, estimates appeared more similar between the two studies at the fourth (17.2% vs 17.2%) and the sixth month (4.7% vs 3.9% in this study).

14.3.1 Comparison of the Prevalence of Breastfeeding and Exclusive Breastfeeding in Cyprus with other countries

Breastfeeding initiation was comparable with estimates seen in some countries, such as Greece (87.9%; Gaki *et al.* 2009), slightly lower than some e.g. Finland (99%; Erkkola *et al.* 2010),

Sweden (97%; Hornell *et al.* 2013), Canada (90.3%; Al Sabah *et al.* 2010), Italy (91.6%; Lauria *et al.* 2016) and Australia (93.3%; Magarey *et al.* 2016) but higher than others e.g. in the UK (81%; McAndrew *et al.* 2012), Ireland (55.3%; Growing up Ireland, 2014) and the Netherlands (75%; Victora *et al.* 2016). The prevalence of BF at six months was lower than respective figures reported elsewhere, such as Italy (57.7%; Lauria *et al.* 2016), Norway (82%; Kristiansen *et al.* 2010), Australia (41.7%; Magarey *et al.* 2016, Scott *et al.* 2006), Canada (53.4%; Al Sabah *et al.* 2010, Chalmers *et al.* 2009) and the US (51.8%; CDC, 2018); comparable to the UK (34%; McAndrew *et al.* 2012) but higher than Canada (30%; Gionet, 2013).

In contrast, the prevalence of EBF was particularly low even at 48 hours, and much lower by comparison to other high-income countries, such as Italy (57.2%; Lauria *et al.* 2016), Australia (75.6%; Scott *et al.* 2006), and even Greece (41.1%; Gaki *et al.* 2009). At six months, only 1 in 20 mothers breastfed exclusively. This particularly low figure appears comparable to the respective figure reported in a recent study from Italy (5.5%; Lauria *et al.* 2016). Even though, the various studies are not directly comparable, neither in terms of methodology nor in terms of the time period of investigation, the low figure of EBF observed in Cyprus at the 6th month appears lower than Norway (10%; Kristiansen *et al.* 2010), Canada (26%; Gionet, 2013), Sweden (11%; Hornell *et al.* 2013) and Spain (10%; de la Torre *et al.* 2001). In contrast, it appears higher than reported estimates from Australia (<1%; Scott *et al.* 2006), Greece (0.9%; Gaki *et al.* 2009) and the UK (1%; McAndrew *et al.* 2012).

By comparison to other studies (Chalmers *et al.* 2009; Lauria *et al.* 2016; Kristiansen *et al.* 2010; Camutdan *et al.* 2008), it is also of note that breastfeeding discontinuation appears to occur sooner in Cyprus since BF rates drop sharply between the first and fourth month. In fact, based on the self-reported time of discontinuation, 50% of the mothers in this study reported discontinuing breastfeeding within the first two months (data not shown in detail). A similar pattern was observed in a study in Greece where the greatest reduction was observed even sooner than in the case of this study (Gaki *et al.* 2009).

14.3.2 Methodological issues on the estimation of breastfeeding indicators

The present study used both a 24-hour recall of infant feeding practices as well as self-reported status to estimate the prevalence of BF and EBF. Even though, the WHO recommends the 24-hour recall dietary method for comparability and consistency of estimation of the breastfeeding indicators, this method has been criticized because it may lead to misclassification of breastfeeding status (Aarts *et al.* 2000; Li *et al.* 2005; Hector, 2011; Agampodi *et al.* 2011). In fact, the 24-hour recall method appears to overestimate EBF at the 4th month compared to self-reported status. This observation could be attributed to the fact that during the weaning phase, mothers may have already introduced other liquids in the child's diet, but exclusively breastfed the day prior to the interview. Other studies have also suggested that the 24h method may overestimate the prevalence of exclusive breastfeeding (Aarts *et al.* 2000; Li *et al.* 2005; Agampodi *et al.* 2011). For example, in Aarts *et al.* (2000) study, current status of exclusive breastfeeding was estimated to be as much as 40% higher at the second and the fourth month and 9.2% at six month in comparison with retrospective measurement of EBF since birth.

In contrast, the 24-hour recall produced a lower estimate for EBF than self-reported status at the 6th month (0.3% compared to 5%) compared to the fourth month. However, this is more likely to be a design effect since the self-reported month of breastfeeding cessation and of liquid/solid introduction in infant feeding was also taken into account to determine EBF or BF status at the fourth and sixth month. For example, at this critical period if a mother was interviewed a few days past the sixth month and reported liquid or solid introduction at the sixth month and no sooner, she was then considered to be breastfeeding exclusively up to the sixth month.

14.3.3 Socio-demographic and other determinants of breastfeeding initiation, exclusivity and duration**14.3.1 Breastfeeding and C/S delivery**

Delivery by C/S was identified as the strongest negative determinant of breastfeeding and exclusive breastfeeding during the first 48 hours. This finding is consistent with several previous studies (Perez-Escamilla *et al.* 1996; Scott, Landers and Hughes, 2001; Rowe-Murray and Fisher. 2002;

Al-Sabab *et al.* 2010; Zanardo *et al.* 2010; Prior *et al.* 2012). The high rate of C/S deliveries in Cyprus might partly explain the very low rate of exclusive breastfeeding. Comparable low EBF rates are reported elsewhere with similar high rates of cesarean section (Pechlivani *et al.* 2005). Furthermore, as in this study, C/S is also associated with breastfeeding duration (Kohlhuber *et al.* 2008; Ahluwalia *et al.* 2012). Evidence supports that delay of initiating breastfeeding may lead to difficulty in successfully establishing breastfeeding and therefore to premature discontinuation (MoH. 2016; Prior *et al.* 2012).

An investigation into the various determinants of the currently very high C/ S rates in Cyprus was not one of the aims of the study, and thus it was not directly addressed. It is well acknowledged that C/S rates are rising worldwide. In Europe, an increase in C/S by 13.8% was observed in the last two decades – from 11.2% in 1990 to 25% in 2014 (Betrán *et al.* 2016). Historical data on the temporal trend of C/S rates in Cyprus are very limited. The earliest estimates only go back to 2007-2008. Based on the latest officially reported data by the Health Monitoring Unit, MoH, C/S rates have increased from 53.4% in 2008 to 56.9% in 2015 (16.4% classified as emergency C/S while 40.5% classified as elective (<http://www.moh.gov.cy/MOH/MOH.nsf/0/29AC9B884C6CB8B9C22579C7003FC9D6?OpenDocument>). Accessed: July 2017. Available at: MoH, Caesarean Sections: Cyprus and other Countries). It is worth noting that C/S rates in the private sector have been constantly high in the last decade (2008-2015), while in this period rates have also risen in the public sector. It is important to note that the C/S rate reported in this study is 54.6%, and is thus consistent with the official data.

The reasons for the very high rates C/S in Cyprus require further investigation. Up to date, no studies from Cyprus have directly addressed the multitude of reasons behind the currently high C/S. One study of qualitative design (Hadjigeorgiou *et al.* 2012) may shed further light into the issue. Even though the study focused on women's choice of place of birth (rather than mode of birth), some of the identified themes provide a deeper understanding into the birth environment as well as some of the perceptions of Cypriot women around childbirth. Medicalization of childbirth, as well as fear and safety of mother and baby were identified as some of the main factors that influence the choice of place of birth. Furthermore, a qualitative study amongst midwives on their role as advocates of normal birth, identified five main interconnected themes: 'lack of professional

recognition', 'deficiencies in basic or continuing education', 'physician dominance', 'medicalization of childbirth' and 'lack of institutional support' (Hadjigeorgiou *et al.* 2014).

14.3.2 Breastfeeding and parity

Evidence on the association of breastfeeding and parity in the literature is inconsistent. Several studies report that primiparous mothers may be more likely to initiate breastfeeding (Scott *et al.* 2001; Manios *et al.* 2009). However, they are more likely to discontinue breastfeeding (Camutdan *et al.* 2008), probably due to lower self-efficacy for breastfeeding and lack of support (Dennis and Faux, 1999). However, it is not uncommon for studies to also show that BF initiation (Tavoulari *et al.* 2015) and premature BF discontinuation (Kohlhuber *et al.* 2008) is more common among multiparous mothers, or report no differences by parity (Ekström, Widström and Nissen, 2003; Camutdan *et al.* 2008).

This is probably largely dependent on the community health services and support (formal and informal) available for first-time mothers, which vary considerably across settings. In this study, lower rates of initiation, exclusivity and duration of breastfeeding were observed among primiparas. This may not be surprising given the lack of breastfeeding support in the community, particularly for first-time mothers.

14.3.3 Breastfeeding and social position

Similarly to the social gradient observed in this study, several studies have repeatedly shown a positive association between educational attainment (Yngve and Sjöström, 2001; Kristiansen *et al.* 2010; Al-Sahab *et al.* 2010; Meedya, Fahy and Kable, 2010; Yin *et al.* 2014; Victora *et al.* 2016) and/or family income (Gaki *et al.* 2009; Meedya, Fahy and Kable, 2010; Yngve and Sjöström, 2001) with breastfeeding initiation and longer duration.

The 2016 Lancet review (Victora *et al.* 2016) found evidence to suggest that at least in high-income countries “...better-educated women breastfeed more commonly than do those in low-income groups with fewer years of formal education”. They suggested that this represents a social gradient reversal since in previous decades breastfeeding was more common in mothers with lower education, at least until the 1960s in the case of the USA. It is very likely that a similar social gradient reversal occurred in most high-income countries, including Cyprus, albeit at different time period and at a different rate.

Beyond indicators of social position, an important aspect which has been receiving more attention in recent years is the health literacy of the parents. A recent study from the US provides evidence to suggest that low parental health literacy is associated with “obesogenic” infant care behaviors, including formula feeding and immediate feeding when baby cries (Flacking *et al.* 2007) and premature BF discontinuation (DeWalt *et al.* 2009). Furthermore, while research evidence suggests that motivation to change towards healthier lifestyle is higher during the transition to parenthood (Edvardsson *et al.* 2011; Lindqvist *et al.* 2017), there is also evidence to suggest that, while intentions may generally improve, perceived behavioural control or actual change may be differential among fathers versus mothers as well as new parents versus established parents (Bassett-Gunter *et al.* 2013). The extent to which this is also differential according to the socio-economic position, or indeed the health literacy, of the parents is not well understood.

The fact that initiation of BF is high (about eight out of ten women initiate BF), low rates of EBF and early discontinuation may not necessarily indicate that parents do not acknowledge the benefits of BF or show lack of motivation (Synnott *et al.* 2007). Taking a socio-ecological framework approach, several factors beyond the intrapersonal level are at play, such as practical difficulties (Odom *et al.* 2013), misconceptions with regards of infant feeding (Synnott *et al.* 2007), such as perception with regards to insufficient milk also observed in this study) and lack of breastfeeding support from the immediate or wider social environment and health professionals, and/or lack supportive policies, such as at the workplace environment (Atchan, Foureur and Davis, 2011). It is very likely that all of these factors are socially patterned, and to some extent may account for the observed social gradient in breastfeeding. With no community midwifery, care is largely provided by pediatricians in the private sector with varied practices, while a number of NGOs fill-in the gap of formal services by providing postnatal education and support, but the capacity and reach is limited. In fact, their services may benefit the more health literate who seek the support, introducing further social stratification.

A recent study in Norway (Bærug *et al.* 2016) has shown striking socioeconomic inequalities in exclusive breast feeding throughout the first five months. Like in this study, mothers with the highest educational attainment were at least three-times more likely to exclusively breastfeed at five months. The study looked at a range of factors that may account for this socioeconomic differential and concluded that smoking habits and breastfeeding difficulties, in particular perceived milk insufficiency, was largely driving this differential.

14.4 BFHI's 10 Steps to Successful Breastfeeding

The overall picture presents a fragmented and suboptimal implementation of the BFHI's practices across maternity care facilities in Cyprus. While the majority of the women reported *receiving help on the management of BF* (Step 5), *receiving no flayers or samples that promote BM substitutes* (ICMBS) and *initiation of BF within 1 hour after birth* (Step 4a), adherence to other maternity practices, such as *skin-to-skin* (Step 4b), *rooming-in* (Step 7), *prenatal information on BF* (Step 3), *BF on demand* (Step 8), *no use of pacifiers* (Step 9) and *seeking help after discharge from the maternity clinic* (Step 10) appeared low based on the self-reported experience of the participating mothers.

With the exception of step 9 (use of pacifiers), for which about half of the mothers reported a positive experience, the percentage of women reporting experiencing or implementing any of the other “good practices” is generally below 50%, while for some components considered as critical for the early and successful establishment of breastfeeding (such as skin-to-skin, rooming-in, no use of pacifiers), the implementation was closer to 20-25%. In fact with regards to breastfeeding education in the prenatal period (step 3), only 15.7% of mothers reported receiving information in the antenatal period on all three topics with regards to successful EBF (the importance of skin-to-skin, rooming-in and the risk of giving water, formula or other supplements in the first six months), while as many as 57.9% reported receiving no such advice.

A report of the degree of implementation of the 10 steps across maternity clinics in Nicosia has been previously published (Hadjiona *et al.* 2016). The findings of this thesis would further suggest that the fragmented implementation of the 10 steps is a nationwide phenomenon. In fact, a suboptimal implementation of the 10 steps was observed across both the public and the private sector, with the public sector appearing slightly better only with regards to single practices such as rooming-in and no use of pacifiers.

Fragmented implementation of the 10 Steps appears to be common in many developed countries (DiGirolamo, Grummer-Strawn and Fein, 2001; Picombe *et al.* 2006; Theofilogiannakou *et al.* 2006; Chien *et al.* 2007; Chalmers *et al.* 2009), even in Baby Friendly Accredited maternity clinics (Merewood *et al.* 2005). For example, the Maternity Experiences Survey (Chalmers *et al.* 2009) is one of the largest studies in the literature that assessed the implementation of the 10 steps based on the self-reported experience of a nationally representative sample of over 8000 women in Canada.

Only 1 in 3 mothers reported experiencing skin-to-skin (compared to 26.1% in this study). Similarly, 55.6% reported that their infant was not given a pacifier within the first week after birth (compared to 49.8% in this study, referring to the first 48 hours only).

Taken together, among the mothers who participated in the current study, only 1% reported experiencing all the Steps (not including Step 6 – Exclusive Breastfeeding). In fact, when Step 6 is included, none of the mothers reported experiencing all the steps during their stay in the maternity clinics. In fact, about half of the mothers (52.7% when Step 6 was not included and 48.6% when step 6 was included) reported experiencing none of the BF-promoting maternity practices. The disappointing findings might partly explain the very low EBF rates, even from the first 48 hours.

One of the reasons that most probably contribute to the scanty adherence to the baby friendly maternity practices in Cyprus and the high proportion of mothers that experienced none of the maternity practices is the lack of a clear BF policy at maternity clinic level (Step 1) and the lack of continuous education of health professionals (Step 2). It is of note that only recently the National Breastfeeding Committee of the Cyprus Ministry of Health has developed a National Strategy for Breastfeeding (2011), followed by a related Policy (2015) (published on the website of the Cyprus Ministry of Health www.moh.gov.cy, available only in Greek). The policy includes a call to launch the Baby-friendly Hospital Initiative. Currently, no hospital in Cyprus is certified as baby-friendly. There is anecdotal reports that one state hospital and one private maternity clinic are currently undergoing a self-assessment as part of the process to apply for BFHI designation status.

It has been argued that the lack of a clear clinic-level written policy, or the lack of enforcement of such as policy by the clinic, in conjunction with the education of the maternity clinic staff, would generally result in low implementation of any of the other “good practices” (Grizzard *et al.* 2006; Haiek, 2012). In fact, Semenik *et al.* (2012) point out that these two steps are the decisive factors for the overall success in the implementation of the Ten Steps. These two steps are generally considered prerequisites for any unit that intends to become Baby-Friendly (Haiek, 2012). Questions with regards to the implementation of these two aspects are not included in the WHO/UNICEF questionnaire directed to mothers. However, an unpublished MSc thesis has explored the implementation of these two steps across maternity clinics in Nicosia based on self-appraisal of the maternity clinic staff and reported low implementation (Tryfonos F. MSc thesis, 2014). Specifically, only 49.5% among the 93 midwives/nurses (38.7% from the public sector and

61.3% from the private sector) reported that the clinic where they work has a written policy on BF, based on the 10 steps, and 46.2% reported that this also covers the ICMBS. Nevertheless, only 25.8% reported that there is a mechanism for evaluating the effectiveness of this policy. Furthermore, in their self-appraisal, while 60-65% reported that the staff members are aware of the importance of breastfeeding and acquainted with the facility's policy and services to protect, promote, and support breastfeeding, only 40% report that they have received any specialized training.

14.4.1 Association of the implementation of the 10 Steps with BF and EBF initiation

The strongest and most consistent evidence for an association with in-hospital initiation of both BF and EBF was observed for two steps: '*early initiation of BF*' (Step 4), either partial or full, and '*no use of pacifier*' (Step 9). In fact, the association of Step 4 with initiation of breastfeeding appears to be stronger when it is fully implemented, suggesting a cumulative effect of both components that comprise Step 4 (early initiation and skin-to-skin). Existing evidence mainly focuses on the investigation of the individual effect of each component '*skin to skin*' (Bramson *et al.* 2009; Moore *et al.* 2016; Mikiel-Kostyra, Mazur and Boltruszko, 2002) and '*initiation of BF within one hour after birth*' (Nakao *et al.* 2008) confirming their individual beneficial effect to BF and EBF initiation.

In particular with regards to skin-to-skin, a dose-response relationship has been suggested, whereby longer duration of skin-to-skin contact is more strongly associated with the likelihood of initiating exclusive breastfeeding (Bramson *et al.* 2009; Moore *et al.* 2016). Similarly, previous studies have suggested that shorter duration of skin-to-skin contact at birth is associated with increased risk of early introduction of formula feeding (Kalmakoff, Gray and Baddock 2017). Mothers who experienced skin-to-skin are more likely to initiate BF early (Aghdas *et al.* 2013), which in turn will result to active suckling success (Inal, Aynid and Canbulat, 2016), increasing the likelihood to achieve successful initiation of BF without any assistance (Inal, Aynid and Canbulat, 2016).

Delivery by C/S is a known determinant of the successful implementation of step 4, and in particular skin-to-skin. The high rate of C/S in our sample would explain to some extent the low proportion of mothers reporting practicing skin-to-skin. Nevertheless, even among mothers who gave birth

vaginally, only 36.5% reported experiencing skin to skin, compared to 19.4% who delivered by C/S. A more striking difference by mode of delivery was observed in terms of early initiation, since 93.2% of mothers who gave birth vaginally reported holding the baby within the first one hour (35.7% experienced full implementation of step 4) in comparison with 58.1% of the mothers (13.4% experienced full implementation of step 4) who delivered by cesarean section.

In relation to the implementation of Step 9, no studies were found that have specifically investigated the association of pacifier use with BF/ EBF initiation. Evidence mainly focuses on the effect of pacifier use on the duration of BF, and will be discussed in the next section.

In relation to the other Steps, a mixed pattern was observed in terms of their association with EBF and/or BF initiation. Specifically, implementation of Step 5 (assistance by maternity clinic staff) appears to have the greatest effect on BF initiation, whereas no association was found with EBF initiation. This seemingly paradoxical result might be due to the fact that mothers who initiated BF (but are not breastfeeding exclusively) might have actually experienced problems and requested for maternity staff support. Thus, practical support and encouragement provided by the maternity clinic staff might helped them to overcome the potential problems during BF initiation. In fact, this assistance might not necessarily pertain to breastfeeding support, but assistance with formula feeding. It is of note that 82.6% of the mothers who did not breastfeed exclusively within the first 48 hours reported introducing formula supplementation. Of those, 84.2% reported receiving help from the maternity staff.

Furthermore, Step 8 (breastfeeding on demand) and ICMBS were also associated with BF initiation, and not EBF. In relation to Step 8, it has been previously suggested that breastfeeding on demand might contribute to fewer formula feedings and thus might contribute to successful BF establishment (Declercq *et al.* 2009). With regards to the ICMBS, it should be noted that a high proportion of mothers in this study reported not receiving any breast milk substitute at least up to the point of the interview i.e. 24-48 hours after birth. While this suggests a high level of implementation of the ICMBS, it might be an overestimation as a result of the study design. Commonly free samples of breast milk substitutes and other may be given at discharge (usually the third day as per current practices in Cyprus).

In contrast to the above, rooming-in appears to be positively associated with exclusivity. In other words, mothers who roomed-in are not necessarily more likely to have breastfed, but if they did

they breastfed exclusively. Continuous mother-infant cohabitation may facilitate the implementation of other maternity practices, and in particular BF on demand. Among mothers who reported experiencing full implementation of Step 8 (*advice for BF on demand – whenever and for as long as the baby wants*), 42.2% also experienced rooming-in, while among those who experienced none of the two components of Step 8, the majority (73.7%) did not experience rooming-in (p-value= 0.005; data not shown). The implementation of Step 8 (i.e. truly unrestricted feeding) is only feasible with rooming-in (WHO, 1998). This association is suggestive of the interrelation between the steps. Furthermore, it is suggestive of a reverse causality i.e. women who intent to breastfeed exclusively may be more likely to both room-in with their infant and breastfeed on demand. Existing evidence in the literature with regards to the role of rooming-in is conflicting on BF initiation. While some studies confirmed of a positive association between rooming-in and BF (Murray *et al.* 2007), others failed to show this association (DiGirolamo, Grummer-Strawn and Fein, 2001). Evidence suggests that rooming-in through, the support of the implementation of Step 8 (WHO, 1998) is associated with longer feeding duration (Crenshaw, 2007), more frequent feedings (Bystrova *et al.* 2009), earlier breast milk production and exclusivity (Crenshaw, 2007) infants that stay with their mothers are less likely to cry and more likely to soothe easier and sleep longer (Keefe, 1987; Crenshaw, 2007). Thereafter, it might reduce the risk of pacifier use for infant soothing/crying due to fewer BF difficulties and unaffected BF production (Kramer *et al.* 2001). The effect of rooming-in did not persist on BF continuation, which is supported by other studies as well (DiGirolamo, Grummer-Strawn and Fein, 2001; Tarrant *et al.* 2011). This might be due to the fact that other BF determinants might have stronger effect on BF continuation, such as the BF difficulties encountered after discharge, provision of social support, insufficiency of BM production etc.

14.4.2 Association of the implementation of the 10 Steps on BF and EBF duration

The association of Step 9 (no use of pacifiers) with BF does not seem to be restricted to the first 48 hours, but appears to persist with for the first six months. In other words, women who reported not using pacifiers while at the clinic were not only more likely to initiate exclusive breastfeeding, but they were also more likely to continue EBF in the longer term. This association has been confirmed by other studies (Aarts *et al.* 1999; Howard *et al.* 1999; Vogel, Hutchison and Mitchell. 2001; DiGirolamo, Grummer-Strawn and Fein, 2001; Kronborg and Vaeth, 2009; Mauch *et al.* 2012).

It has been suggested that mothers who introduce pacifiers early are more likely to perform infrequent (Howard *et al.* 1999) and shorter feedings (Aarts *et al.* 1999) which, in turn, might result to insufficient production of breast milk (Howard *et al.* 1999). Other studies suggested that pacifier use may be an independent determinant of BF discontinuation, over and above the existence of BF problems or incorrect BF techniques (Kronborg and Vaeth, 2009). Alternatively, it has been suggested by O' Connor *et al.* (2009) that the association between BF and pacifier use can be attributed to residual confounding and reverse causality. For example, intention to breastfeed exclusively might influence mothers to avoid pacifier use in general, including for infant calming and soothing. At the same time, use of a pacifier might be a marker for the presence of BF problems or the beginning of weaning (i.e. reverse causality). In fact, they describe pacifiers as “*an implicit form of weaning when mothers are ambivalent about breastfeeding*” (O Connor *et al.* 2009). Pacifier use might also regarded by mothers as a positive behavior associated with longer intervals between feedings and taking the babies of their breast increasing the risk of insufficient milk production (residual confounding) (O Connor *et al.* 2009). Relevant randomized controlled trials revealed no difference in BF duration between different pacifier interventions (i.e. delayed introduction of pacifiers, educational programme for alternative methods of soothing) supporting that pacifier use might be an indicative marker of more complex behaviors (O Connor *et al.* 2009).

Similarly with other studies (Aarts *et al.* 1999; Howard *et al.* 1999), implementation of Step 9 was associated with longer duration of EBF. Findings of the present study show that the positive impact of Step 9 observed at baseline and at first month, is not maintained at fourth and sixth month. This observation might come into agreement with the potential explanation suggested that pacifier use does not have a direct effect on early BF discontinuation rather than it is an indicator of a number of factors and behaviors that are might influence BF outcomes (Kramer *et al.* 2001). For example, mothers that experience breastfeeding difficulties and decide to discontinue BF or EBF, might initiate pacifier use to facilitate the introduction of bottle feeding (Jaafar *et al.* 2011). On the contrary, mothers overcome BF difficulties and decide to continue EBF, pacifier use is less likely to influence duration. Other studies, however, showed of no association (Picombe *et al.* 2006).

Only full implementation of Step 4 was associated with BF and EBF continuation. This observation suggests the importance of successful BF initiation by the implementation of early skin to skin to the successful BF and EBF establishment and continuation (Moore *et al.* 2016). Early skin to skin was associated with the experience of fewer BF difficulties such as breast engorgement (Moore *et*

al. 2016), and thus with reduced risk of formula introduction or early weaning (WHO, 1998). The effect of Step 8 on BF duration was also confirmed by other studies (DiGirolamo, Grummer-Strawn and Fein, 2001).

It should be noted that the association between BF initiation and exclusivity and the experience of any of the Steps is likely to be bi-directional. Mothers who are more knowledgeable on breastfeeding issues and those who intent to breastfeed, and even more so exclusively, might be more likely to request the implementation of the steps (Merten, Dratva and Ackermann-Liebrich, 2005), indicating a bi-directional association between BF and the 10 Steps. In this case, maternity practices might be used as facilitators in successful BF initiation, continuation and exclusivity with the reduction of the risk of BF difficulties and, the development of maternal skills in infant care and enhancement of BFSE.

14.5 Breastfeeding self-efficacy

14.5.1 *Association of Breastfeeding self-efficacy with BF and EBF*

Breastfeeding self-efficacy was strongly associated with EBF initiation as well as continuation of BF/EBF during the first six months. While higher levels of self-efficacy were not associated with the likelihood of breastfeeding initiation, there was a clear stepwise association between self-efficacy and exclusivity. The higher the levels of in-hospital BSES, the more likely for the woman to breastfeed exclusively and to breastfeed for longer (even if not exclusively). For instance, among the quartile of mothers with the highest in-hospital BSES scores as many as 40% initiated exclusive breastfeeding, compared to 7.9% among the quartile of mothers with the lowest BSES scores. The prevalence of EBF for the two middle groups (2nd and 3rd quartiles) appeared in-between with 15.1% and 19.0%, respectively. The stepwise association between in-hospital BSES scores and EBF was evident at the first and the fourth month, when the observed differences were even wider. The proportion of mothers at the upper quartile of in-hospital BSES scores were about eight times more likely to be exclusively breastfeeding compared to women at the lower quartile.

The findings of the present study come into agreement with a long series of previous studies suggesting that breastfeeding self-efficacy is a strong predictor of BF initiation, exclusivity and

continuation (Braghurst *et al.* 2007; O' Brien *et al.* 2008; Semenik *et al.* 2008; Wilhelm *et al.* 2008; McCarter- Spaulding and Dennis, 2010; Pavicic Bosnjak *et al.* 2012; Ip *et al.* 2012; Oliver-Roig *et al.* 2012; Pineiro-Albero *et al.* 2013).

This study measured BSES at the first month. Similar if not even stronger associations were observed between the prevalence of BF/EBF in the long term and breastfeeding self-efficacy as reported at the 1st month. This observation might suggest the presence of a potential bi-directional association between BF and BSES (Pavicic Bosnjak *et al.* 2012). A study by Koskinen *et al.* (2014) showed a positive association between early initiation of BF and BSES measured one week after birth. As stated by Bandura' s self-efficacy theory (1977, 1994) personal accomplishments is the most important source of information. When breastfeeding mothers overcome potential BF difficulties and achieve successful BF outcomes within the first month, an increase in BSES is most likely to occur. On the other hand, after failing to initiate or establish BF, mothers are more likely to have even lower BSES.

While in-hospital BSES score was associated with EBF up to the fourth month, the association between BSES and EBF was not statistically significant at the sixth month. This is more likely due to the small number of women exclusively breastfeeding by that time. Even though differences were not statistically significant, it should be noted that the stepwise pattern of association was still evident. As many as 10% of the mothers with the highest in-hospital BSES were exclusively breastfeeding at the sixth month, compared to 4.7%, 3.3% and 2.3% across quartiles of decreasing BSES scores respectively.

Only a few studies investigated the association of BSES with BF/EBF up to the sixth month (Braghurst *et al.* 2007; O'Brien *et al.* 2008; Semenik *et al.* 2008; Wilhelm *et al.* 2008; McCarter-Spaulding and Gore 2009; Ip *et al.* 2012; Tsai *et al.* 2015) while most of the studies investigated the effect of BSES on BF continuation within shorter time periods (Ku and Chow 2010; Zubaran and Foresti, 2013; Loke and Chan 2013; Yu *et al.* 2014; Glassman *et al.* 2014; Linares *et al.* 2015; McQueen *et al.* 2015; Petrozzi and Gagliardi 2016; Hinic 2016). All studies agreed for the positive association between maternal breastfeeding self-efficacy and BF continuation. In agreement with our findings, several studies also suggest that BSES, measured at any time point can predict BF duration and continuation (Wutke and Dennis 2007; McCarter- Spaulding and Dennis, 2010; Pavicic Bosnjak *et al.* 2012; Ip *et al.* 2012; Oliver-Roig *et al.* 2012; Pineiro-Albero *et al.* 2013).

Two studies, however, showed that in-hospital BFSE can not predict BF at six months (Wilhelm *et al.* 2008, O'Brien *et al.* 2008) suggesting that changes in BFSE levels can occur over time, positively or negatively influenced during the first weeks postpartum by accomplishments, vicarious experiences, and thought patterns or emotional reactions especially in the face of difficulties and obstacles (Wilhelm *et al.* 2008).

14.5.2 Association of the 10 steps with breastfeeding self-efficacy

Three of the 10 Steps showed a clear association with in-hospital BSES. Step 4 (full implementation: *early initiation and skin-to-skin*) and Step 7 (*rooming-in*) showed an association with BSES as recorded within the first 48 hours as well as BSES as recorded at the first month. Evidence on the potential association of Step 4, either partial or full, and rooming-in with BSES in the international literature is limited. The only study that examined the effect of skin-to-skin on BSES in primiparas (Aghdas *et al.* 2013) suggested that the sooner skin-to-skin is initiated and the longer its duration, the higher the maternal BSES. The authors also confirmed that a higher proportion of mothers who experienced skin-to-skin initiated BF. Another study by Koskinen *et al.* (2014) suggested a positive association between early initiation of BF and BSES one week after birth. In this study, the effect of skin-to-skin attenuates and becomes non-significant after successful initiation of BF. As in this study, the study by Koskinen *et al.* (2014) also showed a positive association between rooming-in and BSES.

Interestingly, Step 10 also appeared to be related to in-hospital BSES, with mothers that reported receiving guidance where to seek help when they leave the maternity clinic, having higher levels of BSES. It is not clear whether it is the perceived security of acknowledging beforehand the sources of support, in case that help would be needed for mothers to overcome BF difficulties, that is positively associated with higher maternal BSES-score, or a common variable, such as intention to breastfeed that influences both maternal BSES and the likelihood that a mother would proactively seek advice on BF community support.

In contrast to early skin-to-skin and rooming-in, implementation of Steps 8 (advice to BF on demand) and 9 (no use of pacifiers) appear to have a longer-term, rather than an immediate, impact on BSES. Up to date, no studies have investigated the association of the 10 Steps on BSES in the

long run. Vogel, Hutchison and Mitchell (2001) suggested that low maternal BSES increases the risk of early pacifier use. In the present study, while there was no difference in breastfeeding self-efficacy between mothers who did and did not introduce pacifiers while at the clinic, no use of pacifier while at the clinic was identified as a potential determinant of maternal breastfeeding self-efficacy at the first month. It has been suggested that a pacifier is commonly introduced due to actual BF difficulties (O Connor *et al.* 2009) indicating that pacifier use might be an indicator of maternal response to difficulties associated with BF, that are associated with lower BSES.

BF on demand (i.e. the frequency and the duration of suckling in 24 hours) differs between mother-infant pairs as well as over time. The implementation of Step 8 is associated with the regulation of the production of breast milk volume based on infant needs. This adaptation process results to fewer BF problems (e.g. engorgement), lower risk of insufficient BM production and higher infant weight during the first days after birth (WHO, 1998). Thus, formula supplementation is less likely to be initiated followed by the establishment of EBF and the increase of BFSE (Hinich, 2016).

Interestingly, a negative association was found between step 3 (information in the prenatal period) and first month BSES. Even though it is hard to interpret this association, it would suggest that maternal breastfeeding self-efficacy tends to be higher at the first month among women who did not discuss the benefits and management of breastfeeding with maternity care staff in the prenatal period. One hypothesis about how this result might arise is if women with lower breastfeeding self-efficacy are the ones who are more likely to attend prenatal classes or are more likely to be the ones who bring up the subject of breastfeeding with their doctor or midwife during a consultation in the prenatal period. Worries about being unsuccessful with breastfeeding might explain this association, but this hypothesis cannot be tested with the existing data. Nevertheless, this finding is consistent with the observation that the minority of women (about one in three) who reported discussing the benefits and management of breastfeeding with their doctor or midwife in the prenatal period were more likely to initiate exclusive breastfeeding while at the clinic, but not necessarily continue to exclusively breastfeed while at home.

14.5.3 The interplay between Self-Efficacy Health Literacy and Social Support

Self-efficacy has been considered as one of the main predictors of health and different health events. Strong sense of self-efficacy has been associated with better health status and improvement of health behaviors associated with the anticipating health outcome (Strecher *et al.* 1986; Paasche-Orlow *et al.* 2005) including better adherence to treatment and self-management of a disease (Taal *et al.* 1993; Berkman *et al.* 2011) or other health-related events or outcomes (Berkman *et al.* 2011). In the case of breastfeeding, low self-efficacy was associated with adherence to obesogenic infant care behaviors (Yin *et al.* 2014), including preference to formula feeding (Arenz *et al.* 2004; Yin *et al.* 2014), immediate feeding when baby cries (Yin *et al.* 2014), early introduction of solid foods before the age of four months (Seach *et al.* 2010) and premature BF discontinuation (DeWalt and Hink, 2009). Breastfeeding self-efficacy is improved through the provision of accurate and consistent information on breastfeeding (Chezem *et al.* 2003). Mothers knowledgeable on issues of breastfeeding are more likely to give birth at BF hospitals or request to experience of the BFHI's maternity practices (Merten, Dratva and Ackermann-Liebrich, 2005).

Other important theoretical constructs that are relevant to breastfeeding self-efficacy are health literacy and social support, since both may act as determinants of self-efficacy, or at least as moderators in the association between self-efficacy and a health behavior.

Health literacy is an important determinant of health behavior and outcomes (Nutbeam, 2008). It is thought as a critical component of health behavior empowerment through strengthening health-related self-efficacy and thus, achieving the desired health outcome (Osborn *et al.* 2010). Low parental health literacy has been negatively associated with infant and child health-promoting feeding practices (DeWalt and Hink, 2009). Furthermore, premature breastfeeding discontinuation and early introduction of formula supplementation is more likely to be reported among mothers with low health literacy (Kaufman *et al.* 2001). Even though, it is well established that educational intervention programs, either targeting breastfeeding self-efficacy (Noel-Weiss, Bassett and Cragg, 2006) or breastfeeding behavior directly (Lumbiganon *et al.* 2012) have been associated with better breastfeeding outcomes, there is no evidence to date in terms of the potential effect of educational programs on improving health literacy in general.

In the case of social support, it is more commonly thought to influence better health outcomes, including breastfeeding, through impacting on self-efficacy as a mediator (Dennis, 2006). A body

of literature has established the importance of professional and lay support on successful initiation and continuation of BF (Sikorski *et al.* 2003; Britton *et al.* 2007; Hannula *et al.* 2008). Nevertheless, the potential interplay between social support and health literacy has not yet been clarified (Lee, Arozyllah and Cho, 2004). Accurate and consistent informational and instrumental social support might improve health literacy and, consequently, strengthen self-efficacy. A recently published report by the UK's National Institute for Health Research (2015) reviewed a series of clusters of peer-support intervention programmes, including one cluster of breastfeeding peer-support programmes. Characteristically, the report described peer support “as a public health intervention in search of a theory” noting that there are no reviews exploring why or how peer support works to improve health literacy” (Harris *et al.* 2015).

It has been suggested that social support might act as a buffer particularly in the case of individuals with low levels of health literacy (Lee, Arozyllah and Cho, 2004). At the same time it has been suggested that it might only improve health outcomes on individuals with high levels of health literacy (Berkman *et al.* 2011). An indirect evidence of this comes from a Cochrane review of experimental or quasi-experimental studies on the potential effectiveness of strengthening support (formal, peer or lay) on breastfeeding, which concluded that such programmes seem to be more effective in settings with high breastfeeding initiation rates (Renfrew *et al.* 2012).

14.6 Perceived Reasons of BF Discontinuation

The most common reported reasons of BF discontinuation were related to difficulties and misconceptions related to BF. Breast milk insufficiency was by far the most commonly reported reason of early BF discontinuation among the study sample (62.5% agreed or strongly agreed with this statement), followed by concern with regards to the quantity of breast milk the baby consumes (reported by 32.7%). This finding is consistent with the findings of other studies (Thullier and Mercer, 2009; Odom *et al.* 2013). Maternal perception of not producing enough breast milk to satisfy infant's nutritional needs is an outcome of either infrequent feedings or poor BF skills or inadequate knowledge in relation with breast milk production (Surgeon's Call, 2011). Negative emotional reactions to the presence of BF difficulties such as anxiety, pain and fatigue might inhibit the production of the oxytocin hormone and therefore can cause poor breast milk production. This phenomenon is referred as the "insufficiency milk syndrome" (Dennis, 1999; Riordan and Wamback, 2010). These reactions also negatively influence maternal breastfeeding self-efficacy (Dennis, 1999), associated with perceived maternal BM insufficiency (Otsuka *et al.* 2008) and increased risk of BF discontinuation.

Health care professionals' support has significant role in premature discontinuation of BF. Even though evidence supports the positive association of professional support with BF, due to fewer BF difficulties (Sikorski *et al.* 2003; Britton *et al.* 2007; Hannula *et al.* 2008). Lack of support as well as misinformation on BF issues by health care professionals (AAP, 1997; Dennis, 2002; Clifford and McIntire, 2008) due to lack of appropriate formal training and knowledge on BF and lack of confidence to resolve BF problems (Clifford and McIntire, 2008), can positively influence perceived BM insufficiency and maternal concern on the sufficiency of the quantity of breast milk the infant consumes.

Return to work ranked third in terms of the importance of the perceived reasons of BF discontinuation with 23.9%. In general, return to employment has been reported as one of the most common barriers of BF discontinuation (Thullier and Mercer, 2009). Evidence is conflicting on whether the timing of return to work influences early BF discontinuation. While some studies confirmed a positive association (Chuang *et al.* 2010; Smith *et al.* 2013), others did not (Ogbuanu *et al.* 2011). The timing of return to work is also determined from other working premises such as the sufficient provision of payment during maternity leave (Hawkins *et al.* 2007). Lack of

workplace supportive environment also influences maternal decision on premature BF discontinuation. (Smith *et al.* 2013). Most common reasons of perceived BF discontinuation in relation with return to work were inflexibility in working hours (Dennis, 2002; Surgeon's Call, 2011; Smith *et al.* 2013) that result to infrequent feedings, and thereafter to breast milk insufficiency and difficulties of expressing breast milk (Smith *et al.* 2013) as well as colleague hostility (Thulier and Mercer, 2009).

14.7 Strengths and Limitations

This is the first study to provide current estimates of breastfeeding and exclusive breastfeeding past the first 48 hours in Cyprus, based on a nationally representative sample with the participation of nearly all maternity clinics in the country from the public and private sector. A clear strength of the study is its prospective design which facilitated the assessment of infant feeding practices over the period of the first six months, avoiding the recall bias of a retrospective design. Furthermore, in addition to self-reported BF and EBF status, the study also assessed the time of introduction of liquids or solids. The extent to which the self-exclusion of two larger private clinics has affected the estimates is not clear, but the national representativeness of the sample is supported by the fact that no differences were observed in terms of the anticipated proportion of C/S as well as the socio-demographic characteristics of the sample based on best available national data. Finally, the study measured maternal breastfeeding self-efficacy using the most commonly used scale internationally (BSES-SF) and the implementation of “10 steps for successful breastfeeding” based on the self-reported experience of the participating mothers using the official WHO/UNICEF questionnaire.

The present study also has a number of limitations. Firstly, the baseline response rate was 73.5%, which nonetheless is within the range observed in studies elsewhere (Kristiansen *et al.* 2010). Even though selection bias cannot be ruled out, the fact that both the rate of caesarean sections as well as the prevalence of exclusive breastfeeding at 48 hours appear observed in this study are very close to official published figures by the Cyprus Ministry of Health (MoH, 2010; MoH, 2015; MoH 2016) offers a good indication that non-response may not have greatly affected the representativeness of the sample. Reasons for not participating were not clear; thus, the extent to which any selection bias from non-participation has over- or underestimated the prevalence is not

known. The fact that the observed prevalence rate of BF/EBF are very similar to the only available data may suggest that there hasn't been much improvement in nearly a decade. Alternatively, assuming that a less favorable attitude towards breastfeeding may have contributed to the decision of mothers to opt-out, then this may also suggest that the study may have not only overestimated the true prevalence of breastfeeding, but also that there has been a decline in BF and EBF prevalence over this period.

Furthermore, the response rate during the follow-up phase of the study was 63.5-65.0%. Similarly, even though, no significant socio-demographic or other differences were observed in terms of participation to the follow-up phase of the study, it is more likely that the study has overestimated (rather than underestimated) the true prevalence, given that mothers with a more positive attitude towards breastfeeding as indicated by reported intention to breastfeed were more likely to participate.

Moreover, it should be acknowledged that the present study measured the individual association of each of the 10 Steps on BF outcomes and on breastfeeding self-efficacy, but not the cumulative effect of all maternity practices as a pack on BF outcomes. This was not deemed useful since only 1% of the sample reported experiencing all the Steps, even when not including Step 6 – Exclusive Breastfeeding. The study applied stepwise regression models in order to identify the set of practices which are more predictive of BF outcomes and breastfeeding self-efficacy. This approach was preferred to a multivariable model (which would include all variables) due to collinearity between the variables.

Recognizing the potential bi-directional association between experiencing the 10 steps, breastfeeding self-efficacy and BF behaviour/outcomes, the study avoided hypothesizing a causal relationship between the experience of “good practices” and positive BF outcomes mediated by breastfeeding self-efficacy. Also, the study described the magnitude of the observed associations, and avoided any inferences about a causal nature. It is, thus, recognized that while the experience of “good practices” may positively impact maternal breastfeeding self-efficacy, at the same time, mothers with higher breastfeeding self-efficacy may be more likely to request and demand the implementation of certain “good practices”. Similarly, while the experience of “good practices” may positively impact on BF outcomes, both short-term as well as long-term, at the same time, intention to breastfeed (measured here only with a single-item) or other potential covariates

related to motivation for BF (e.g. beliefs and attitudes related to breastfeeding and child-rearing, maternal personality characteristics, etc) may actually be driving both the likelihood that a mother will breastfeed and/or breastfeed exclusively as well as the likelihood that she will implement or demand the implementation of certain "good practices".

Finally, the study used only quantitative methods since the aim was to provide first-time estimates of breastfeeding in Cyprus beyond the 48 hours and explore the extent to which the implementation of the 10 steps are associated with breastfeeding self-efficacy and breastfeeding outcomes. However, an in-depth exploration of the perceptions and attitudes of women in Cyprus with regards to breastfeeding, and perceived reasons for premature discontinuation using qualitative methods would have enriched the study findings.

Chapter 15:

Conclusions

Despite the fact that the prevalence of BF initiation appears to be high among mothers in Cyprus, the low prevalence of exclusive breastfeeding even at 48 hours along with the relatively low prevalence of any breastfeeding past the fourth month of the infant's life, positions Cyprus among the last places in Europe (alongside Greece and the UK). On a positive note, the high BF initiation rates may indicate that women in Cyprus intent to breastfeed. Hence, breastfeeding could be protected, promoted and further supported. It is noteworthy that almost all mothers reported that they did not BF as long as they wanted to.

The fragmented implementation of the “10 steps for successful breastfeeding”, together with the particularly high rates of cesarean section, may contribute both to the relatively low breastfeeding self-efficacy observed among women in Cyprus, as well as to the low prevalence of exclusive breastfeeding and to the premature discontinuation of breastfeeding before the fourth month of the infant's life. Nevertheless, it should be noted that even on the sixth month, as many as one in three women were still breastfeeding, even if not exclusively. Interestingly, returning to work was only cited by one in four women to be an important reason for discontinuing breastfeeding. Also, the vast majority cited “milk insufficiency” and “concern for the quantity of breast milk the infant is receiving” as the most important reasons for discontinuing to breastfeed.

The fact that the main reasons cited for discontinuing breastfeeding point to psychosocial, cultural and lack of informational support mechanisms, suggests that these are more amenable to change. Provided that womens' knowledge on breastfeeding, including accurate information on the physiology, and management of breastfeeding is adequate, the incidence of true reduction in milk production is low. In contrast, poor knowledge and management of breastfeeding can lead to increased supplementary feeding and hence reduced milk production. The lack of professional and/or lay or peer support in the community for breastfeeding mothers can exarcebate the problem.

Overall, the findings of the present study, identify the need for intervention planning, in order to achieve the international targets of BF throughout the promotion and protection of BF. These may include policies, which will be directed to the adherence of maternity clinic facilities to the BFHIs

good practices, as well as interventions to strengthen maternal breastfeeding self-efficacy through the implementation of educational and community support programmes.

15.1 Interventions to strengthen breastfeeding self-efficacy

15.1.1 Maternity clinic practices and the implementation of the ten steps

The majority of studies in the published literature assessing the association between the implementation of the “10 steps” and breastfeeding outcomes, are observational or quasi-experimental (Pérez-Escamilla et al, 2016). Moreover, these studies evaluate the association or the impact, of maternal clinic practices on short-, medium- or long-term breastfeeding outcomes, without necessarily considering possible mediating factors, such as breastfeeding self-efficacy. In fact, evidence from intervention studies on the effect of maternity clinic practices on breastfeeding via the enhancement of breastfeeding self-efficacy is very limited. Even so, the systematic review by Pérez-Escamilla *et al.* (2016) concluded, to quote, that: “Adherence to the BFHI Ten Steps has a positive impact on short-term, medium-term and long-term breastfeeding (BF) outcomes. There is a dose–response relationship between the number of BFHI steps women are exposed to and the likelihood of improved BF outcomes (early BF initiation, exclusive breastfeeding (EBF) at hospital discharge, any BF and EBF duration)”.

Only one intervention study has been identified to explicitly examine this association. This study examined the effect of a breastfeeding self-efficacy intervention with the participation of 781 pregnant women from two Baby-Friendly accredited hospitals and two non-BF hospitals in Japan. The study has a quasi-experimental design with one BFH and one non-BFH participating in the intervention group and one BFH and one non-BFH in the control group. (Otsuka *et al.* 2014). The intervention involved providing a breastfeeding self-efficacy enhancing workbook at the third trimester. Maternal BSES was higher during hospital stay and within the first month after birth, followed by an increase in EBF rates at 4 weeks postpartum, at the intervention site. However, the intervention improved breastfeeding self-efficacy and exclusive breastfeeding at 4 weeks only in BFHs. The authors concluded, to quote, that “*When breastfeeding self-efficacy interventions are implemented, hospital infant feeding practices may need to be optimized beforehand*”. Even

though, the study suggests that adherence to “good practices” can enhance short-term maternal BSES and thereafter improve breastfeeding outcomes, the magnitude of the individual impact of the maternity care practices on the effect of the BSES-enhancing intervention was not estimated .

15.1.2 Education and/or support interventions

A recently updated Cochrane review (McFadden *et al.* 2017) with the inclusion of 73 trials, (58 individually-randomised trials and 15 cluster-randomised trials) and as many as 75,000 mother-infant dyads, provided sufficient evidence on the beneficial effects of breastfeeding support interventions on BF and EBF duration up to the first six months. This confirms the findings of previous reviews (Renfrew *et al.* 2012; Hoddinott *et al.* 2011). However, the authors emphasize that the effectiveness of the intervention depends on the type as well as the frequency of support provided. Some evidence suggest that interventions which incorporate both antenatal and postnatal component, combining professional and lay/peer support and are provided face-to-face on a specific schedule of 4-8 sessions, are more effective. Interestingly, the authors also found some evidence to suggest that such interventions are more effective in settings with high initiation rates.

Only a few intervention studies designed their educational or support intervention based on self-efficacy theory and/or investigated the effect of breastfeeding education and/or support programmes explicitly through the enhancement of self-efficacy. A pre- and post-test experimental study with the participation of 74 Chinese primiparas (Wu *et al.* 2014), included a number of sessions that developed on the basis of Bandura’s (1977; 1994) Self-Efficacy Theory with regards to the four sources of information. Significant differences on BSES were found between the intervention and the control group at four and eight weeks after birth, while enhancement of BSES in this period was found to be significantly higher in the intervention group [4 weeks: 58.88 (5.26) vs 52.29 (6.60); 8 weeks 59.85 (5.04) vs 53.00 (7.52)]. . Furthermore, the authors showed that the positive impact of the intervention on BF duration and exclusivity, was mediated by the enhancement of BSES. In their study, Nichols *et al.* (2009) created a self-efficacy intervention workbook to reflect Dennis (1999) breast-feeding self-efficacy, and was also based on the four sources of information of self-efficacy (Bandura, 1977; 1994). The authors also showed

that improvements on breastfeeding self-efficacy were associated with better breastfeeding outcomes, including exclusivity and longer breastfeeding duration.

In a pilot RCT, with the participation of 150 primiparous mothers, McQueen *et al.* 2011, investigated the effect of a breastfeeding self-efficacy intervention with the provision of three enhancing breastfeeding self-efficacy intervention sessions. Even though, mothers in the intervention group had higher BSES scores as well as higher exclusivity rates and longer breastfeeding duration, the observed differences were not statistically significant. In contrast, in another RCT by Noel-Weiss *et al.* (2006), mothers in the intervention group attended a 2.5-hour prenatal breastfeeding workshop. The intervention was designed on the basis of Bandura's Theory of self-efficacy. The intervention did not have any impact on EBF at 8 weeks. Nevertheless, subgroup analysis on the basis of participant attendance at the workshop, suggested about a 3-fold increase of EBF at week 8 (OR: 3.2; 95% CI: 1.26, 7.94).

15.2 Implications and Recommendations

The National Breastfeeding Committee for the protection, promotion and support of breastfeeding of the Cyprus Ministry of Health, has developed a National Strategy for breastfeeding (2011) and related Policy document (2015), which includes a call to launch the Baby-friendly Hospital Initiative. Currently, no hospital in Cyprus is certified as baby-friendly. The four priority pillars set by the National Breastfeeding Committee, are:

- Policy, Management, Financing
- Data monitoring system
- Information, Training, Education, and
- Research

The next sections will discuss implications for policy, both within and beyond the health care system (**Section 14.2.1**), implications for clinical practice, including the need for a data monitoring system and training of health professionals (**Section 14.2.2**), and finally implications for research (**Section 14.2.3**).

15.2.1 Implications for policy

15.2.1.1 Health care system

The first pillar of the National Strategy refers to actions, initiatives and other incentives that aim to promote the goals of the National Policy for breastfeeding, which is largely based on the adherence to 10 steps as “optimal maternity care practices”. The establishment of specific policies for the protection of BF at all organizational levels is important, spanning from the Ministry of Health to the level of individual clinics. It is indicative that the first one of the 10 Step to successful breastfeeding specifically refers to the existence of a set policy on the basis of the “10 Steps” and the International Code of Breastmilk Substitutes at the level of maternity clinics. Thus, the expressed commitment of the clinic to support breastfeeding is generally considered to be a prerequisite for the successful implementation of all other steps,. According to the WHO/Unicef recommendations, the intention to support breastfeeding is not enough, and it is expected that the commitment of the clinic should be expressed in a written policy. It is expected that the policy should be communicated on a systematic basis to all maternity care facility’s staff who interact

with the breastfeeding mother. This includes both health care professionals (gynecologists, midwives, pediatricians) as well as all other administration level staff (e.g. receptionists, cleaners) who come in contact with new parents. The recommendations, also, state that the clinic policy should be available, at least in summary form, to mothers and families. Furthermore, a mechanism to audit and monitor its implementation should be available. This thesis has shown that the implementation of the 10 Steps across maternity care facilities in Cyprus presents major shortcomings. Thus, in this context of policy, the following recommendations should be considered:

- Further promotion of National Committee's Strategy/Policy on Breastfeeding, and specifically an effort to promote the institutionalization of the 10 steps and the Code as "minimum standard of good practice". The national policy should be clearly communicated to all maternity clinics across the public and private sector, and mechanisms for monitoring its implementation should be developed. Encouragement for the development of a BF policy at the clinic-level should be provided and the necessary training of all maternity care staff (midwives, nurses, pediatricians, gynecologists) should be promoted as it will further facilitate the compliance of the maternity care clinics to BFHI practices.
- Specific actions may include providing incentives and aid for maternity units to develop a breastfeeding policy, which according to the "10 steps" recommendations needs to be written, communicated on a systematic basis to all staff (health professionals and others) who come in contact with the nursing mother, available and visibly posted in summary to mothers/families.
- Furthermore, it would be important to provide encouragement and incentives for the certification of maternity hospitals as "Baby-Friendly". Especially, in the public sector, the natural step after adopting a National Strategy and a Policy for Breastfeeding would be to identify and aim for at least one maternity hospital to be certified as "Baby-Friendly".
- In addition, there is a pressing need for interdisciplinary policy action to protect, promote and support breastfeeding, including structural changes such as the introduction of community maternal care (e.g. through expanding the role of existing health professional groups, such as health visitors, or through the establishment of new roles such as community midwifery). Furthermore, the establishment of population-level public health

programmes are important, including public awareness campaigns to challenge both potential misconceptions (e.g. insufficient milk) as well as social norms (e.g. breastfeeding in public).

15.2.1.2 Beyond the health care system

Suboptimal implementation of “good” maternity care practices hampers the successful initiation and establishment of BF. However, factors pertaining to the health care system are not entirely responsible for the low EBF rates and the premature BF discontinuation. A multitude of socio-cultural and socio-political factors are at play, which interact to constitute

(a) the wider culture” around breastfeeding which includes the predominant social norms and related attitudes and perceptions of the current generation of parents with powerful historical and future connections since they were shaped or at least influenced by the attitudes and perceptions of the previous generation and in turn they will shape the attitudes and the perceptions of the next generation,

(b) the political system, the legislation and the different policies that might collide with negative outcomes (e.g. health policies that aim to the promotion of Breastfeeding against labour legislation) and

(c) the financial interests of employers or breastmilk substitutes companies.

Thus, factors over the control of the health care system, operating in the wider social, labour, market and policy environment are also responsible for the current situation. An overall consideration of the determinants of breastfeeding would require the adoption of a socio-ecological lens. Similarly, policy measures to tackle low breastfeeding rates would require designing public health programmes with policy measures and relevant actions based on a socio-ecological approach. Understandably, this is not an easy endeavor, since it would require complex cross-sectoral initiatives with simultaneous interventions at multiple levels and domains of society. Thus, it may not be surprising that there are no research studies that implemented any such unified programmes incorporating elements at all levels of the socio-ecological model. Current interventions generally tend to focus on specific aspects in isolation, such as evaluating community peer-support programmes, implementation of maternity care practices etc. Nevertheless, it has been acknowledged in the literature and, in theory, it is accepted that efforts to improve national BF

indicators should include interventions at multiple levels simultaneously spanning beyond the mother, the family and health care professionals to include the wider social environment, the workplace environment, labour legislation and the wider state policies. (Tiedje LB et al. 2002). This position has been adopted by the WHO as well as relevant scientific bodies (Zachou & Benetou, 2004). Characteristically, the WHO breastfeeding campaigns include a series of leaflets referring to all relevant actors and their role in supporting breastfeeding, corresponding largely to the five levels of the socio-ecological model. Namely, these are entitled “what mums can do” (inter-personal level), “what dads can do” and “what family and friends can do” (intra-personal level), “what health professionals can do” (organizational level), “what co-workers can do” and “what employers can do” (community level) and finally, “what trade unions” and “what lawmakers can do” (policy level)

In contrast to other European countries that achieved traceable improvements in promoting and supporting breastfeeding over the last decade (Cattaneo *et al.* 2010), tangible policy actions as well as enactments of relevant laws for the protection and support of breastfeeding in Cyprus are limited. Up to date, no relevant laws have been enacted, besides maternity leave and more recently, for the protection of BF in public. Currently, maternity leave in Cyprus is 18 weeks, of which 11 weeks are compulsory (2 before the week of the expected birth and the rest after birth). As of 1 August 2017, the parliament has passed a law with regards to the right of working dads to paternity leave of two-week duration and paternity payment at 72% of the weekly salary. Paid maternity leave varies between different countries with the highest duration being reported in the UK with 39 weeks followed by Croatia with 30 weeks, Czech Republic with 28 weeks, Ireland with 26 weeks and Hungary with 24 weeks. Despite the fact that the UK ranks amongst the highest positions in relation to the duration of maternity leave, it is still among the countries with the lowest BF duration rates in Europe (McAndrews *et al.* 2012; Victora *et al.* 2016). Furthermore, the average payment rates of maternity leave does not exceed one third of the gross average earnings, corresponding to 12 weeks of fully paid maternity (OECD, 2017), which is among the lowest after Portugal with 6 weeks of fully paid maternity leave (OECD, 2017). Maternity pay is well below the ILO recommendations which state that it should not be lower than two thirds of previous earnings (Cattaneo *et al.* 2004). This suggests that the duration of maternity leave is not a sufficient measure to increase BF duration. Additional premises are required to provide the necessary conditions to achieve adequate workplace breastfeeding support that will enable mothers to BF longer. In a study

by Hawkins *et al.* (2007), British/ Irish mothers are more likely to BF for less than 4 months if they have to return earlier to work for financial reasons or informal baby care arrangements. In contrast, mothers who have supportive work arrangements or receive additional pay to the Statutory Maternity Pay (SMP)⁸ are more likely to BF for more than four months.

Paid maternity leave in most of the countries ranges between 12 -22 weeks with an average of 18 weeks. Most of the countries offer more than 50% of full payment, with only 12 countries providing of full earning compensation, such as Croatia (30 weeks of paid maternity leave), Poland (20 weeks of paid maternity leave), Austria (16 weeks of paid maternity leave), Chile (18 weeks of paid maternity leave), Estonia (20 weeks of paid maternity leave), Germany (14 weeks of paid maternity leave), Luxembourg (16 weeks of paid maternity leave) and Portugal (6 weeks of paid maternity leave). The US is the only country that does not provide any kind of paid maternity or paternity leave (OECD, 2017). Not many studies have examined the effect of maternity leave duration on breastfeeding outcomes. A study in California (Guendelman *et al.* 2009) showed that a maternity leave of less than 6 weeks or 6 to 12 weeks after delivery was associated, respectively, with a fourfold and twofold higher odds of failure to establish breastfeeding and an increased probability of early cessation. Another study indicated about two times higher likelihood of BF discontinuation on the month of return to work (Kimbrow *et al.* 2006). A positive association has also been observed between return to work with the timing of formula introduction and thus premature BF discontinuation. Mothers who return to work earlier than six months, introduce formula about two months before returning in comparison than those that return to work after six months (Smith *et al.* 2013).

The recent Lancet paper (Rollins *et al.* 2016) suggested that of 185 countries, only 38 meet the International Labour Organization's 14-week minimal standard and only 42 meet or exceed the recommendation of 18 weeks' leave. Even though the maternity leave in Cyprus is 18 weeks (which in fact can be extended by one additional week for every 21 days in case baby has to be hospitalized up to a maximum of 6 weeks), it is not clear what proportion of women take advantage of the full maternity leave they are entitled by law, as there are no official statistics on the actual duration of maternity leave among women in Cyprus.

⁸ SMP is the weekly payment made by the employers to their employees or former employees (www.gov.uk)

Even though in this study return to work was the third in rank perceived reason for early BF discontinuation, it should be noted that the sharpest drop in breastfeeding rates was observed before the fourth month (which would coincide with the full length of the maternity leave), and in fact as many as 50% of the participating mothers reported discontinuing before the second month (the minimum compulsory maternity leave of 9 weeks after birth). This would suggest that the prospect of returning to work and having to negotiate breastfeeding and work might be an underlying reason, even though recognized as important only by one in four mothers in this study. Nevertheless, the reality of returning to work is more complex and, in fact, it has been suggested that difficulties expressing breast milk resulting from long mother-infant separation and breast milk insufficiency (cited in this study as the main reason for discontinuing breastfeeding) are amongst the most commonly cited challenges after returning to work (Smith *et al.* 2013).

Thus, an increase in the duration of maternity leave might be a potential measure to tackle early breastfeeding discontinuation. Commonly, this should be followed by policies and strategies to promote BF workplace support. Studies have shown that breastfeeding can be continued after returning to work in settings where that are breastfeeding-friendly (Kosmala and Wallace, 2006; Weber *et al.* 2011; Amin *et al.* 2011). Such policies will enforce employers to provide the necessary facilities and support that will enable mothers to continue breastfeeding after return to work. In the USA, for example, workplace support programs have been developed and promoted to employers providing them with incentives, including an official breastfeeding-friendly workplace certification programme (Shealy, Benton-Davis and Grummer-Strawn, 2000). Such policies are thought to promote a BF-friendly environment at the workplace (Shealy, Benton-Davis and Grummer-Strawn, 2000). Furthermore, the US health resources and services Administration Maternal and Child Health Bureau has launched a national workplace initiative to provide support to employers who wish to become BF- friendly. This initiative includes a resource tool for employers “The Business Case for Breastfeeding” which includes material and guidelines for businesses and public health agencies to implement workplace lactation programs. This programme has not been evaluated in terms of its effectiveness to positively influence breastfeeding rates. Nevertheless, even if viewed as a token programme, it carries a societal message of a BF-friendly culture. Thus, similarly to the Baby-Friendly Hospital initiative, a similar certification programme could be adopted by policy makers and public health national agencies whereby workplaces and businesses could be certified as “Baby-friendly”.

15.2.2 Implications for clinical practice

15.2.2.1 *Data monitoring system*

The current study estimated prevalence of BF and EBF beyond the 48 hours and up to the sixth month after birth in Cyprus for the first time, providing preliminary data on the magnitude of the problem. However, this was done in the context of a research study. Monitoring BF indicators should be conducted on a continuous and systematic basis since it constitutes an integral part of the implementation and progress evaluation of National Breastfeeding Policy. Thus,

- It would be important to further develop and expand the current monitoring system for breastfeeding indicators, operating within the Health Monitoring Unit, MoH, both in terms of recorded indicators (i.e. breastfeeding initiation, exclusivity, maternity clinic practices) as well as in terms of coverage in order to include the private sector, which accounts for as many as 70% of annual births. In the case of the private sector, Perinatal Health surveys at routine intervals with the support of the Statistical Office could be undertaken both in the context of providing a base for monitoring the current situation as well as assessing the effectiveness of policies, actions, measures and interventions. .
- In parallel to the development of a monitoring system, it is important to adopt specific, measurable and achievable targets (and associated indicators), as well as to set a timeframe for achieving the targets and for assessing progress at intermediate intervals. This should be done in parallel with the design and implementation of specific actions and appropriate evidence-based interventions. An evaluation of their effectiveness at regular intervals and relevant feedback with regards to necessary modifications and improvements should be incorporated in the planning.

15.2.2.2 *Training and continuous education of health professionals*

Adherence to the 10 Steps to Successful Breastfeeding has been consistently associated with better BF/EBF initiation and continuation rates.. Despite the fact that implementation of the maternity care practices is suboptimal, it is necessary that health care professionals are supportive and comply with the maternal decision to BF or EBF. The implementation of a number of key maternity practices (for example, early initiation with skin-to-skin contact, no use of pacifiers) will facilitate BF initiation, continuation and exclusivity. Several studies (DiGilliramo *et al.* 2001), including the

present study, suggested that key maternity practices are associated with the enhancement of BSES and successful BF initiation, exclusivity and continuation .

However, extensive literature supports that training of health care professionals, is not effective in the absence of policies and initiatives at national and at maternity clinic level. For the improvement of BF outcomes, it is necessary to invest in breastfeeding knowledge, attitude and supportive behaviors of healthcare professionals (Watkins and Dodgson, 2010). This can be achieved with the development and the implementation of BF educational programs as well as development of healthcare professionals' communication skills. Many studies suggested that attitudes of healthcare professionals might influence maternal BF decision. Even perceived neutrality on the part of the maternity clinic staff has been shown to increase the likelihood of premature BF discontinuation, even before the first six weeks (DiGirolamo, Grummer-Strawn and Fein, 2003).

- While there is no shortage of training seminars and workshops for health professionals organized on a regular basis by various stakeholders (e.g. the. National Breastfeeding Commintee, The Cyprus Breastfeeding Association “Gift for Life”, and others), it is important for education on breastfeeding to be incorporated in the wider policy of maternity care facilities. A Mandatory continuing education on breastfeeding could be adopted by the Ministry of Health as part of a broader policy for maternity clinics. In parallel there should be mechanisms in place to ensure opportunities for health professionals to attend as well as incentives for more health professionals to train as Certified Lactation Consultants. Opportunities for training other staff in maternity clinics who come in contact with mothers should also be provided..
- Beyond the maternity care facilities, education on breastfeeding also concerns the academic institutions of the country with clinical programmes. It would be important to introduce, or strengthen if already in place, breastfeeding education (incl. benefits, management etc) in the education curriculum of midwifery and nursing students, but also medical students, pediatric and obstetrics specialists. In addition, it would be important to identify or create opportunities to promote learning among registered professionals (e.g. pediatricians, gynecologists, midwives, nurses). In recent years, the National Committee for Breastfeeding has successfully organized workshops on breastfeeding as part of the Annual Conference of the Cyprus Nurses and Midwives Association as well as the annual

conference of and the Pediatric Society. Such initiatives should continue and future efforts should concentrate on organising inter-disciplinary training activities. Coordination of actions among all involved parties (i.e. all relevant professional associations and scientific societies) is needed. Aligning and harmonizing their official positions on breastfeeding would be considered a prerequisite.

15.2.2.3 *Information, education and support for expectant and new parents*

There is strong evidence in the literature to suggest that both educational and/or community support interventions are effective in positively affecting BF and EBF initiation rates and duration. . (Chung *et al.* 2008; Renfew *et al.* 2012; Jolly *et al.* 2012; Haroon *et al.* 2013; McFadden *et al.* 2017). Therefore, it would be important to invest more in breastfeeding education to pregnant women and their families since the existing practice has significant shortcomings. For example, while maternity hospitals in the public sector and a number of private clinics or NGOs offer childbirth preparation classes , and most would include breastfeeding as part of their curriculum, these are restricted to in the antenatal period. Postpartum there is limited support for women who want to breastfeed. In Cyprus, it is generally not institutionalized but it is provided by the private sector (at a fee) or by NGOs. Even though access to the NGO services is generally free, attendance is very likely to be dependent on the maternal intention to breastfeed on one hand and the general level of health literacy on the other, sustaining in this way the existing social inequalities.

- Education should be conducted systematically rather than limited to individual sessions or lectures as part of the antenatal education programme. The learning objectives should be to provide adequate and consistent information to mothers and their partners about the benefits as well as management of breastfeeding, but also empowerment in order to enhance breastfeeding self-confidence and the importance of support from the immediate environment of the mother (partner, family, health professionals). Maternal empowerment is a particularly important aspect, since it can also ensure that mothers are aware of and request the implementation of the "good practices" during their stay in the maternity clinic.
- There is plenty of evidence in the literature to suggest that breastfeeding training programs to future mothers are less effective when limited to the prenatal period. They should span the prenatal to the postnatal period. In fact, a systematic review of the literature suggested that the second best case is when training and support is offered postpartum (Renfew *et al.*

2012). Furthermore, evidence suggests that they should be implemented on an individual and/or group level, by suitably trained health professionals and / or lactation consultants, and they should be addressed not only to mothers, but also to fathers and other family members (Chung *et al* 2008; Renfew *et al* 2012; Jolly *et al* 2012; Haroon *et al* 2013; McFadden *et al.* 2017). More importantly, training programs should not be restricted to an educational character, but they should incorporate provision of support, both professional and informal, for example, community-based lay or peer-to-peer support groups (Renfew *et al* 2012; McFadden *et al.* 2017).

- It is well acknowledged that paternal support is the most important form of support (Scott and Binns, 1999; Dennis, 2002). Active paternal involvement in infant care including BF, has been associated with improved BF and BSES outcomes (Tohotoa *et al.* 2009). Paternal support on BF-related challenges , especially on tangible support; paternal commitment to BF by acting as BF advocates; emotional support and encouragement; acceptance of the required time commitment on BF was acknowledged by mothers among the main reasons of enhancing maternal confidence and determination to BF (Tohotoa *et al.* 2009). Thus, there might be a need to consider designing and evaluating education programs offered specifically to fathers. In fact, there is some evidence to support that fathers attending prenatal classes are more likely to acknowledge the beneficial effects of BF and be more persuasive and supportive on mother's decision to initiate BF (Wolfberg *et al.* 2004; Surgeon' s Call, 2011). Paternal peer support might be more effective through the development of father-to-father peer support groups. There might be a need to design and evaluate such programmes alongside maternal peer support groups. Paternal peer support groups can enhance paternal empowerment and increase fathers' knowledge around the management and challenges of BF in order to successfully support their partners (Stremmler and Lovera, 2004).
- Assessment of maternal BSES is an important tool that should be adopted in clinical practice. As this study suggests, it can facilitate as a screening tool the identification of the mothers at higher risk to discontinue breastfeeding prematurely. Once mothers with low BSES levels are identified, targeted professional and/or peer support could be provided in order to enhance BSES and support the continuation of breastfeeding.

- It is also important to support and strengthen the efforts of non-governmental organizations and breastfeeding support or advocacy groups since they constitute an invaluable community resource and an extensive support network of health professionals, breastfeeding mothers and other volunteers. Furthermore, it is important to consider the current structure of available formal maternal health care services in the community and their reorganization, especially for the care and support to mothers and families in the postnatal period either through the widening of existing roles or the establishment of new roles such as Community Midwifery.
- Finally, breastfeeding is a whole society matter. Thus, in order to redefine the societal values and promote a “Breastfeeding friendly” culture, education on breastfeeding could be incorporated in health promotion school curriculum from pre-school to high school.

15.2.3 Implications for research

The fourth pillar of the National Breastfeeding Strategy refers to research. Establishing a central monitoring system for breastfeeding indicators is considered necessary. Such a system will be in the interest of monitoring future trends and evaluating progress towards set goals in a systematic and not research-funds dependent manner. However, beyond tracking epidemiological indicators, there are many research questions with regards to breastfeeding behaviour of national as well as international importance. This study is a descriptive quantitative study that highlighted the magnitude of the problem both in relation to maternity practices and breastfeeding indicators, issues for which there were no prior research data. Currently, beyond the data provided by this study, there is no other research on breastfeeding in Cyprus, with the exception of a descriptive study among new mothers in Nicosia (Isaia *et al.* 2017).

The present study highlights the need for further research with qualitative and/or mixed-methods design in order to provide a better understanding of the multi-dimensional phenomenon of BF. It would be important to foster synergies between government, academic institutions and non-governmental organizations in order to promote breastfeeding research and strengthen the research base, both with regards to more practical aspects (e.g. further establishing the predictive validity of BSES as a screening tool) to wider aspects such as the social, historical and cultural factors that impact on the low breastfeeding rates.

- Further studies are needed to establish the predictive validity of BSES-SF as a screening tool for clinical practice. Setting the cut-off values for BSES-SF, both in-hospital as well as expected change in the first weeks after birth, will allow the use of the BSES-SF tool by healthcare professionals in order to identify mothers at higher risk of early breastfeeding discontinuation. Up to date, only one study (Nanishi *et al.* 2015) was conducted for setting specific cut-off values for the BSES-SF and used the tool to predict the risk of EBF cessation after discharge among a Japanese population.
- Findings of the present study suggest that the experience of the 10 steps while at the clinic is associated with maternal breastfeeding self-efficacy. Nevertheless, the descriptive nature of the study precluded inferences in terms of the causal relationship between “good practices” and self-efficacy. For instance, it would be important to gain an understanding as to the extent to which the implementation of “good practices” impacts on maternal breastfeeding self-efficacy, and the extent to which the reverse process is also at play i.e. mothers with higher levels of self-efficacy are more likely to expect and demand the implementation of “good practices”. While it is likely that both processes are at play, gaining an in-depth understanding of the inter-relationship between self-efficacy and quality of provided care is important since different intervention approaches might be more suitable depending on whether they are focusing on a “top-down” or a “bottom-up” approach. In the first case, the assumption would be that an organizational-level intervention, for example the implementation of the 10 steps, could positively affect maternal breastfeeding self-efficacy. In the second case, the assumption would be that educational programmes aiming to strengthen the breastfeeding self-efficacy of pregnant women could result in better maternity health care services. In this respect, the development, implementation and evaluation of breastfeeding education programmes grounded on self-efficacy theory in well-designed intervention studies should also be considered.
- Furthermore, future research should be focused on the development and the evaluation of breastfeeding community support programmes which aim to enhance maternal breastfeeding self-efficacy. These programmes could include both formal as well as peer/lay support (e.g. mother-to-mother support groups).

- The need to promote a more generally BF-friendly culture may suggest the need for population-wide breastfeeding promoting campaigns. Such campaigns should be carefully designed and evaluated for their effectiveness. Formative research with qualitative and / or mixed-method methodology on the reasons for the low EBF initiation rates, early BF discontinuation as well as the reasons for the high rates of C/S would be important in order to understand the different dimensions and aspects of the problem and thus inform the design of targeted and culturally-appropriate interventions.
- Future studies could also concentrate on wider aspects of the problem such maternal, paternal and other family members' knowledge, attitudes and perceptions about the benefits and management of breastfeeding as well as community-wide attitudes towards breastfeeding, including attitudes towards breastfeeding in public places, or breastfeeding at the workplace

Finally, it would be important to explore the lived experience of mothers who breastfeed as well as those who do not breastfeed. One interesting aspect discussed in the literature that deserves due consideration is that often breastfeeding promotion initiatives as practiced may contribute to women's perceptions of feeling guilt and shame if they do not breastfeed (Benoit *et al.*2016).

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APPENDICES

Appendix A: List of publications and presentations in international and European conferences

Articles in peer-reviewed journals

Economou M, Kolokotroni O, Paphiti-Demetriou I, Kouta C, Lambrinou E, Hadjigeorgiou E, Hadjiona V, Tryfonos F, Philippou E, Middleton N. **Prevalence of breast-feeding and exclusive breast-feeding at 48 h after birth and up to the sixth month in Cyprus: the BrEaST start in life project**. Public Health Nutrition. 2018; 21(5): 967-80.

Abstracts in journal supplements

Economou M, Paphiti-Demetriou I, Kolokotroni O, Kouta C, Lambrinou E, Hadjigeorgiou E, Hadjiona V, Tryfonos F, Filippou E, Middleton N. **Prevalence and continuation of breastfeeding in Cyprus: the BrEaST start in life project**. European Journal of Public Health 2015; 25 (Suppl 3): 92

Middleton N, Economou M, Hadjiona V, Kouta C, Lambrinou E, Paphiti-Demetriou I, Hadjigeorgiou E, , Tryfonos F, Filippou E, Kolokotroni O **Implementation of the '10 Steps for Successful Breastfeeding' across maternity clinics in Cyprus** European Journal of Public Health 2015; 25 (Suppl 3): 53.

Economou M, Paphiti-Demetriou I, Kolokotroni O, Kouta C, Lambrinou E, Hadjigeorgiou E, Hadjiona V, Tryfonos F, Filippou E, Middleton N. **Breastfeeding self-efficacy at 48 hours and breastfeeding up to the 6th month: the Cyprus BrEaST start in life project**. European Journal of Public Health 2016; 26 (Suppl 1): ckw170.067

Economou M, Paphiti-Demetriou I, Kolokotroni O, Kouta C, Lambrinou E, Hadjigeorgiou E, Hadjiona V, Tryfonos F, Filippou E, Middleton N **Maternity clinic practices and exclusive breastfeeding in Cyprus: BrEaST start in life study**. European Journal of Public Health 2017; 27(Suppl. 3): ckx187.219

Economou M, Paphiti-Demetriou I, Kolokotroni O, Kouta C, Lambrinou E, Hadjigeorgiou E, Middleton N **Perceived social and workplace support among breastfeeding mothers in Cyprus** European Journal of Public Health 2017; 27 (Suppl. 3): ckx186.290

Oral presentations in European conferences

Economou M, Paphiti-Demetriou I, Kolokotroni O, Kouta C, Lambrinou E, Hadjigeorgiou E, Hadjiona V, Tryfonos F, Filippou E, Middleton N. **Prevalence and continuation of breastfeeding in Cyprus: the BrEaST start in life project**. European Public Health Conference, Milan, Italy, October 2015.

Economou M, Paphiti-Demetriou I, Kolokotroni O, Kouta C, Lambrinou E, Hadjigeorgiou E, Hadjiona V, Tryfonos F, Filippou E, Middleton N. **Breastfeeding self-efficacy at 48 hours and breastfeeding up to the 6th month: the Cyprus BrEaST start in life project**. European Public Health Conference, Vienna, Austria, November 2016.

Appendix B: Tables of the main features of studies discussed in Chapter 6 - Systematic Review

Table 6.2 (a): Main features of the study design of methodological studies that investigated the association of maternal Breastfeeding Self-Efficacy (MBFSE) with BF outcomes

N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample	Sample Size (N)	Specific Sample Characteristics	Country
Postpartum Assessment of the Association between Maternal BFSE and BF initiation, duration and exclusivity													
1	Wutke & Dennis (2007)	BSES-SF	Construct Predictive	Reliability Cronbach α =0.89 Mean= 55.5 $\pm$ 8.4 Item Mean= 3.97 (3.23-4.31)	In –hospital N=1	Not reported	Exclusive : BM + other liquids infrequently Partial (>= 1 bottle/ day) Bottle feeding (no BM)	8 weeks 16 weeks	24 hours	Convenience / 5 hospitals N=105 (8 th and 16 th week) RR:83.3%	NA		Poland
2	Gregory <i>et al</i> 2008	BSES-SF	Predictive Construct validity (primiparous ;M=43.1	Reliability Cronbach α =0.90 M=46.46 (SD=12.75), item	In-hospital	Labbok & Krasovec's (1990)	EBF, Almost EBF, High BF, Partial BF, Token BF, FF	In – hospital Week 4 th	24 hour / recall self-reported	not reported/ 1 hospital N=165 RR: N=124 (54%)	Ethnic ally diverse sample		UK

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N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample	Sample Size (N)	Specific Sample Characteristics	Country
			(SD=11.6); multiparous with previous experience : M=49.4 (SD=12.9); p-value=0.001)	M=3.32 (2.98-3.58)									
3	Eksioglu & Ceber 2011	BSES	Predictive Construct	Reliability Cronbach α =0.91 (1 st week) , 0.92 (4 th week) Mean= 131.8+- 22.07 Item Mean= 4.58 (2.31-4.94)	Weeks 1, 4 and 8 N=3	Not reported	EBF BF	Weeks 1, 4 and 8	Not reported/ current status	Not reported/ 2 mother-child health care units N=165 RR: 165/171	NA		Turkey
4	Pavlic Bosn	BSES-SF	Construct Predictive	Reliability Cronbach α =0.86	In –hospital N=1	Labbok & Krasovec	Exclusive (only BM)	In-hospital	Not reported	Convenience/ 1 hospital (BHI)	NA		Croatia

N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample	Sample Size (N)	Specific Sample Characteristics	Country
	jak <i>et al</i> (2012)			Mean= 55+-7 Item Mean= 4 (3-5)			Partial (Almost EBF, High BF, Partial, token) Non-BF	1 st month 6 th month	current status??	N=190 RR: 81%			
5	Ip <i>et al.</i> 2012	BSES-SF	Construct Predictive	Reliability Cronbach α =0.95 Mean= 41.1+-10.7 Item Mean= 2.91 (2.20-3.51) Construct validity	In –hospital N=1	Labbok & Krasovec	EBF (only BM or with < than 1 bottle of formula/ day) Partial BF (with > than 1 bottle of formula/ day) FF (breast only for soothing)	48-72 hrs Months 1 st and 6 th	24hr recall No of days of BF until discontinuation	Not reported/ 3 maternity clinics (1 hospital)	N=185, RR not reported, Attrition Rare: 4.9% (N=9)	Hong Kong Chinese	Hong Kong
6	McCarter - Spaulding &	BSES-SF	Construct Predictive Factor Analysis	Reliability Cronbach α =0.94 (In-hospital) , 0.92 (4 th week)	In-hospital Week 1	Labbok & Krasovec	EBF (EBF, almost EBF, high BF) Partial BF ($\geq$ 1 FF/day),	Weeks 4 and 24	24 hours / Current status	Not reported N=153 RR: (153/175) FU: NA		Black women of African	USA

N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample	Sample Size (N)	Specific Sample Characteristics	Country
	Den nis (2010)						Weaning (Token BF , FF)					descen t	
Postnatal and Antenatal Assessment of the Association between Maternal BFSE and BF initiation, duration and exclusivity													
7	Toka t <i>et al.</i> (2010)	BSES-SF Self-comple ted	Construct Predictive	Reliability Cronbach α =0.87 Mean= 60.09+- 8.27 Item Mean= 4.29 (3.77-4.68)	Sample 1: Antenatally- 3 rd trimester Sample 2: 1 st week postpartum	Labbok & Krasovec	BF EBF, high BF, Bottle feeding	12 weeks – both groups Within 1 week- postpar tum group Self- reporte d	24 hours	Convenience 2 samples prepartum N=144/ 4maternity clinics (2 private/ 2 public) RR=91.6% Post partum sample: N=150/ 3 maternity clinics (1 private/ 2 public) RR=92.5%	NA		Turk ey
8	Den nis <i>et al</i> 2011	BSES-SF	Criterion-related	Reliability Antenatal	Prenatally > 34 weeks Postnatally	Labbok & Krasovec	BF (≥ 1 times), EBF, high BF,	1 st and 4 th week	Current status/ self-reported	Convenience/ 2 prenatal clinics/ 1 hospital		Adole scents	Can ada

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N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample	Sample Size (N)	Specific Sample Characteristics	Country
			Factor analysis Predictive Known groups procedure	Cronbach α =0.84 Mean= 51.72+-7.69 Item Mean= 3.69 (3.48-3.94) Postnatal Cronbach α =0.93 Mean= 56.23+-12.27 Item Mean= 4.02 (3.70-4.36)	Week 1 st and 4 th		partial BF and FF			N=103			
9	Oliv er- Roig <i>et al</i> 2012	BSES-SF	Construct –known group comparison Convergen ce/ Predictive	Reliability Cronbach α =0.92	In-hospital N=1	Not reported	EBF	3 weeks	Not clear	Convenience / 1 public hospital N=135 24-48 hrs (2nd day)		NA	Spain

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N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample Size (N)	Specific Sample Characteristics	Country
										No loss to follow up		
10	Wheeler & Dennis 2013	Modified BSES-SF	Construct (Comparison of constructed groups/ Factor Analysis) Predictive Criterion-Related Validity	Internal Consistency Cronbach α =0.88 Mean= 79.39+-9.98 Item Mean= 4.41 (3.96-4.83)	Week 1 st	Not reported	Any BF, FF(discontinued FF and Breast pumping)	Week 1 st and 6 th	Not clear	Convenience N=144	Ill or preterm infants	Canada
11	McQueen <i>et al.</i> 2013	BSES-SF	Construct (Factor Analysis) Predictive	Reliability and Internal Consistency Cronbach α =0.92 Mean= 51.32+-11.79 Item Mean= 3.69 (3.43-3.94)	In-hospital N=1	Labbok & Krasovec (1990)	EBF, Combination feeding, FF	In-hospital Weeks 4 th and 8 th	Current status Self-reported	Convenience N=130	Aboriginal women	Canada

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N/A	Author	Tool	Validity	Other psychometric	Point (s) of Measurement Number of times measured	BF operational Definition	Definitions Used	Point(s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sampling Sample	Sample Size (N)	Specific Sample Characteristics	Country
Prepartum Assessment of the Association between Maternal BFSE and BF initiation, duration and exclusivity													
12	Pineiro-Albero <i>et al.</i> 2013	PBSES	Predictive	Reliability and Internal Consistency Cronbach α =0.91 Group differences in self-efficacy: Mean= 72.32+-13.36	3rd trimester	Not reported	EBF, any BF	At discharge	Current status From hospital database	Convenience / 1 hospital (BFI) N=234 Not reported Not reported	NA		Spain

NA: Not Applicable⁹

Table 6.2 (b): Characteristics, analytical approach and main findings of Methodological Studies that investigated the association of maternal Breastfeeding Self-Efficacy (MBFSE) with BF outcomes

N/A	Author	Eligibility Criteria	Other main study variables/ measurement tools	BFSE as predictor, mediator, and/ or outcome	Main analytical approach	Main co-variates/ adjustments	Main Findings
Postpartum Assessment of the Association between Maternal BFSE and BF initiation, duration and exclusivity							
1	Wutke & Dennis (2007)	>=16 years, read and speak Polish, gestation >= 37 weeks gestation, no factors that interfere with BF (singleton, no high-risk pregnancy)	NA	BFSE as a predictor	Mean Difference BFSE scores by BF status (BF vs bottle feeding; EBF vs partial BF or bottle feeding} at 8 and 16 weeks	NA	The higher the BFSE in hospital the longer the BF duration (the more likely the mother to BF at 8 and 16 weeks): <u>8 weeks:</u> BF Vs FF: 56.7 (8.1) Vs 50.7 (7.9) p=0.003 EBF Vs Partial Vs FF: 58.1 (7.5) Vs 52.9 (8.0) Vs 50.7 (7.9) p=0.001 <u>16 weeks:</u> BF Vs FF: 57.9 (7.3) Vs 50.6 (8.5) p=0.001 EBF Vs Partial Vs FF: 58.0 (7.0) Vs 55.7 (9.4) Vs 50.6 (8.0) p=0.001
2	Grecory et al 2008	Understand English, >= 18 years, >= 36 weeks gestation	NA	BFSE a predictor of EBF at 4 weeks	Mean BSES score differences by BF status at 4 th week	NA	BFSE at hospital a predictor of BF status at 4 weeks Higher scores of BFSE at hospital more likely to EBF at 4weeks than BBF or BF Hospital EBF Vs Partial: 47.9 (12.2) Vs 37.4 (11.6), p<0.001

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N/A	Author	Eligibility Criteria	Other main study variables/ measurement tools	BFSE as predictor, mediator, and/ or outcome	Main analytical approach	Main co-variables/ adjustments	Main Findings
							4 weeks EBF Vs Partial: 58.6 (8) Vs 43.3 (9.8), p<0.001 Predictive: EBF Vs Partial Vs BF :49.4 (12.9) Vs 44.7 (9.5) Vs 42.4 (11.7), p<0.001 Caucasian Vs other: 44.4 (12.1) Vs 48.4 (12.9) p=0.04
3	Pavicic Bosnjak <i>et al</i> (2008)	>= 18 years Speak and read Croatian, live in Zagreb, singleton, healthy Multiple births, high-risk pregnancy, mother –infant not discharged together, any factor that interfere with BF	Sense of Coherence Scale (SOC-13)	BFSE predictor of BF	Mean Scores of BSE between BF and non-BF mothers at 1st and 6th month, respectively Mean Scores of BSE according to BF status (EBF Vs partial BF or non-BF at 1st and 6th month, respectively Multivariate Logistic regression of EBF at 1st and 6th month	Age, parity, education, monthly family income	Independent predictor of EBF at 1st month <u>1st month</u> BF Vs FF: 56(7) Vs 49 (8) p<0.001 EBF Vs Partial Vs FF: 57 (7) Vs 52 (6) Vs 49 (8) p <0.001 adj OR: 1.10 (95% CI: 1.05; 1.16; p<0.001) <u>6th month</u> BF Vs FF: 57 (7) Vs 53.7 () p<0.001 EBF Vs Partial Vs FF: 58 (7) Vs 56 (7) Vs 53 (7) p <0.001 adj OR: 1.05 (95% CI: 0.99; 1.12; p=0.08)
4	McCarter-Spaulding	IC: >=18 years, Singleton, Full term	Network support for	Predictor	Mean differences in scores at 1 st week by	NA	BSE a strong predictor of BF duration and exclusivity

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N/A	Author	Eligibility Criteria	Other main study variables/ measurement tools	BFSE as predictor, mediator, and/ or outcome	Main analytical approach	Main co-variates/ adjustments	Main Findings
	& Dennis (2010)	Speak English, Intention to BF ,BF initiation of BF the first 24 hrs EC: Ill, preterm, factors that influence BF	breastfeeding (NSB)		BF/ EBF status at 4 th week and 24 th week Cox Proportional Hazards Model (depended variable: time until weaned- analysis of breastfeeding duration		BSES and Infant feeding at hospital: EBF Vs BF+FF Vs FF : 55.3 (10.7) Vs 51.0 (10.8) Vs 45.5 (15.2), p<0.01 BSES and Infant feeding at 4weeks: BF Vs FF: 52.6 (11.3) VS 47.0 (15.1),p=0.04
5	Eksioglu & Ceber 2011	IC: All BF mothers at discharge, >= 37 weeks of gestation, EC: Aby factor that could interfere with BF or the infant not discharged with mother	NA	BFSE as a predictor	Mean Difference BFSE scores by BF status (BF vs bottle feeding; EBF vs partial BF or bottle feeding} at 8 and 16 weeks	NA	<u>1 week:</u> EBF Vs BF : 154.2 (8.54) Vs 139.3 (17.49) p<0.01 <u>4 weeks:</u> EBF Vs BF: 156.5 (10.0) Vs 148.8 (14.8) p<0.01 <u>8 weeks:</u> EBF Vs BF: 157.0 (9.32) Vs 150.0 (16.92) p<0.005
6	Ip <i>et al.</i> 2012	>=18years, speak and read Hong Kong Chinese, singleton, full term Leave Hong Kong, medical or obstetric illness, EBF with	NA	BFSE predictor	Mean scores' differences with BF duration and the 3 categories of BF (EBF, partial, bottle feeding) at 1 st month and 6 th month	NA	Positive correlation of BFSE and BF duration (r=0.33, p-value<0.001) BFSE scores higher in those that EBF at 1 st month (p-value=0.001) Cut off value =45.5 on BFSE- 92% discontinued BF <6 months ; Sn= 77% Sp=73% PPV= 92%, NPV=42%

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N/A	Author	Eligibility Criteria	Other main study variables/ measurement tools	BFSE as predictor, mediator, and/ or outcome	Main analytical approach	Main co-variates/ adjustments	Main Findings
		expressed milk, special care nursery			Predictive value of BFSE (ROC analysis) on BF discontinuation < 6 months		1st month: EBF Vs Partial Vs FF: 46.6 (9.5) Vs 39.4 (10.0) Vs 38.6 (10.6) p<0.001 6th month: EBF Vs Partial Vs FF: 50.5 (8.8) Vs 45.9 (10.2) Vs 39.2 (10.1) p<0.001
Postnatal and Antenatal Assessment of the Association between Maternal BFSE and BF initiation, duration and exclusivity							
7	Alus Tokat <i>et al.</i> (2010)	Antenatal: 3rd trimester, singleton, BF Intention Postpartum: >= 18 years, >= 37 weeks gestation, 1st week, read and speak Turkish, any factor that interferes with BF (multiple births, medical conditions, birth defects)	NA	Predictor	BFSE scores between infant practices (BF vs almost EBF vs high BF vs F; BF vs FF) at 12 weeks for prenatal and postnatal samples, respectively	NA	Prenatal and postnatal BSES a predictor of EBF/BF at 12 weeks <u>Antenatal</u> BF Vs FF (57.23 (6.8) Vs 54.7 (6.7) p=0.04; EBF Vs Almost EBF Vs High BF Vs FF (59. (6.3) Vs 56.0 (5.7) Vs 55.6 (6.7), p=0.004 <u>Postnatal</u> BF Vs FF (58.64 (7.04) Vs 53.46 (7.22) p<0.001; EBF Vs Almost EBF Vs High BF Vs FF (61. (5.8) Vs 54.4 (4.6) Vs 54.0 (2.9), p<0.001
8	Dennis <i>et al</i> 2011	IC: >= 34 weeks gestation, Singleton Positive towards BF EC: <37 weeks. NICU, congenital abnormalities,	BF Attitudes Questionnaire (BAQ)	Predictor	Mean differences of antenatal and postnatal BFSE by BF status at 4 weeks Mean differences of postnatal and	NA	Postnatal and antenatal BFSE positively associate with BF initiation and duration and exclusivity <u>Antenatal BSES</u> BF initiation: Yes Vs No: 53.29 (6.83) Vs 48.74 (5.54); p=0.005

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N/A	Author	Eligibility Criteria	Other main study variables/ measurement tools	BFSE as predictor, mediator, and/ or outcome	Main analytical approach	Main co-variates/ adjustments	Main Findings
		removed from mother's care			antenatal BFSE between BF and FF at 4 weeks		At 4th week: BF Vs FF: 55.04 (6.48) Vs 49.19 (7.1) p-value<0.001 EBF Vs High BF Vs FF: 55.9 (6.66) Vs 51.7 (7.08) Vs 52.36 (0.98) Vs 49.26 (7.66); p=0.001 <u>Postnatal BSES</u> At 4th week: BF Vs FF: 62.59 (7.18) Vs 48.5 (12.58) p-value<0.001 EBF Vs High BF Vs FF: 62.17 (7.92) Vs 62.4 (3.41) Vs 57.72 (12.42) Vs 49.08 (12.57); p<0.001
9	Oliver-Roig <i>et al</i> 2012	>= 18 years Read and speak Spanish >= 36 wks gestation Factor that interferes with BF (multiple birth, health issues,	General self-efficacy scale, stress management scale Socio-demographic	BFSE predictor of EBF	Mean score difference BSES at discharge between EBF and other categories at 3 weeks	NA	Higher mean BFSE at discharge for EBF at 3weeks BFSE at discharge predictor for mothers that EBF at 3 weeks Mean diff: 4.17 (95% CI: 0.21-8.13)P=0.039
10	Wheeler & Dennis 2013	IC: >< 16 years, understand English, plan to BF EC: long term medication incompatible with	Perceptions of insufficient milk supply	Predictor	Mean score difference BSES at 6 weeks between infant feeding method	NA	Higher mean modified BFSE scores at 1st and 6th week between BF and non-BF <u>6th week</u> BF:M= 83.44 (SD=8.23) vs non-BF=75.51 (SD=10.08), p-value<0.001

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N/A	Author	Eligibility Criteria	Other main study variables/ measurement tools	BFSE as predictor, mediator, and/ or outcome	Main analytical approach	Main co-variates/ adjustments	Main Findings
		BF. Health problems that preclude BF					(results for 1 st month not reported)
11	McQueen <i>et al.</i> 2013	IC: read or speak English, phone accessibility EC: Factors that preclude BF	Edinburgh Postnatal Depression Scale	Predictor	Mean score difference BSES at 4 and 8 weeks between infant feeding method	NA	4th week EBF:M=56.05 (SD=9.31) vs Combination Feeding: M=48.24 (SD=12.72) vs FF : M=45.63 (SD=11.77), p-value=0.001 8th week EBF:M=56.74 (SD=9.38) vs Combination Feeding: M=49.09 (SD=13.09) vs FF : M=44.17 (SD=10.09), p-value=0.0002
Prepartum Assessment of the Association between Maternal BFSE and BF initiation, duration and exclusivity							
12	Pineiro-Albero <i>et al.</i> 2013	IC: Read and speak Spanish 3 rd trimester EC: Multiple pregnancy Health conditions that interfere with BF	NA	Prenatal BFSE predictor of EBF at discharge	Differences in BSES-e scores between EBF and non-EBF at discharge	NA	Prenatal BFSE predictor of EBF at discharge EBF Vs non EBF:73.78 (12.48) Vs 65.84 (15.94)

Table 6.3 (a): Main features of the study design of observational studies that investigated the association of maternal Breastfeeding Self-Efficacy (MBFSE) with BF outcomes

	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
1	Baghurst <i>et al</i> 2007	Prospective cohort	BSES	Not reported	Week 1 st	WHO	Full (BM only) Partial (Formula, or solids, or both, BM), weaning (No BM)	Weeks 6 th Months 3 rd and 6 th	Not reported Current status Self-reported	Not reported /1 hospital N=317 out of 378 (recruitment at 3 rd trimester)	Primiparas	Australia
2	O' Brien <i>et al.</i> 2008	Prospective survey-based study	BSES-SF	Not reported	In –hospital	Webb <i>et al.</i> 2001	Full BF, Complimentary BF, any BF, FF	In-hospital (0-14 days) Month 6 th	Self-reported	Not reported/ 2 hospitals N=375 RR: 59.4% 15%	NA	Australia
3	Tsai <i>et al.</i> 2015	Prospective	BSES	Reliability	In –hospital	Labbok &	EBF, Almost	In-hospital	24 hour recall	Purposive/ 2 hospitals	Primiparous	Taiwan

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Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
			Cronbach α =0.93		Krasovec's (1990)	EBF, High BF, Partial BF, Token BF, FF	Months 3 rd and 6 th		(urban/suburban)-BFHI accredited N=300 (150 from each hospital) – 258 all 4 stages RR= 78.9% and 70.4% Attrition rates 7.7% (1 st month) 3.2% (3 rd month) 3.7% (6 th month)		

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
4	Semenic <i>et al.</i> 2008	Prospective	BSES	Reliability Cronbach α =0.89(Baseline) Cronbach α =0.93 (6 weeks) Cronbach α =0.92 (4weeks)	In-hospital 6 th week 4 th month N=3	Consistent with Labbok & Krasovec's (1990) definitions	EBF (almost EBF) Any BF Weaning (non BF)	In-hospital 6 th week Months 4 th and 6 th	Self-reported	Convenience/ 3 hospitals (24-72hrs) N=248 RR=189/248 Lost to follow up 6 wks: 179/189 4 months: 175/189 6 th month= 167/189 (attrition= 12%)	Primiparous mothers that indicated to BF for at least 6 weeks	Canada
5	Wilhelm <i>et al.</i> 2008	Multisite rural pilot	BSES	Reliability	Hospital	NA	BF	Hospital	Not reported	Convenience/ 3	Primiparous	US

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	Author	Study Design	Tool	Psycho metric	Point (s) of Measurement Number measured	BF operation al Definition	Definition s Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/ retrospective)	Sample	Specifi c Sample Characteristic s	Countr y
				Cronbac h α =0.95 (Baselin e) Cronbac h α =0.97 (2 weeks)	2 weeks N=2			Days 2and 4 Weeks 6 Months: 2, 3, 4,5 ,6		communit y hospitals N=73	rural mothers	
6	Mossman <i>et al.</i> 2008	Prospectiv e correlational	BSES -SF	Not reported	Prenatally > 34 weeks 1 st week	NA	BF	Week 1 st and 4 th	Self-reported	Convenien ce/ 1 hospital N=100 NA	Adolesc ents Recruit ment (during pregnan cy)	Canada
7	McCarter-Spaulding & Gore 2009	Descriptiv e longitudinal cohort	BSES -SF	Internal Consiste ncy α =0.94	during maternity clinic stay/1 st week	Labbok & Krasovec (1990)	EBF; BF: FF/weanin g	In-hospital self-reported	Current status (24hrs)	Convenien ce 1 urban hospital /	Of African Descent	US

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
					postpartum) N=1			1 st month-6 th month (monthly) Telephone interview		155 women RR: (155/261) FU: 143/155 (1 st month) FU: 125/155 (6 th month)	only for BF mothers	
8	Ku Chow 2010	& Cross-sectional and correlational	BSES	Content Validity =0.94 Intraclas correlation Coefficient= 0.94	Hospital (1-2days postpartum) N=1	Not reported	EBF	Hospital Weeks 1, 2, 4, 6	Not reported	Convenience/ 1 maternity clinic N=82 RR 100%	Chinese Primiparas that intent to BF or EBF	Hong-Kong

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
				(Dai & Dennis, 2003)								
9	Zubaran & Foresti 2013	Cross-sectional	BSES-SF	Not reported	Between 2 nd and 12 th week	Not reported	EBF, Partial	Between 2 nd and 12 th week	Not reported Current status	Convenience/hospital N=89 N=89	BF mothers	Brazil
10	Loke and Chan 2013	Descriptive correlational	BSES-SF	Reliability Cronbach α =0.93 (Dai & Dennis 2003)	In-hospital	WHO (1998)	EBF, complementary BF, FF	In-hospital Week 6 th	Not reported Current status	1 hospital N=199 RR: 98.5%	Chinese mothers	Hong Kong
11	Yu <i>et al</i> 2014	Prospective cohort	BAPT (6 items)	Predictive (factor analysis loadings > 0.65)	Pregnancy – 7 th month	WHO (2008)	EBF, Partial, Full	In-hospital Month 3 rd	24 hr recalls Since birth	volunteers / 6 prenatal clinics (unions) N=2400	NA	Bangladesh

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
				Factor analysis						RR: 100%?? 2178 (91%) – 3 months		
12	Koskinen <i>et al</i> 2014	Cross-sectional	BSES-SF	Reliability Cronbach α =0.93 Predictive	Within 1 week postpartum	Not reported	EBF, Partial BF, weaning	Within 1 hour after birth	Current status	Convenience N=573 RR=41%	NA	Finland
3	Glassman <i>et al.</i> 2014	Not stated	BSES-SF	Not reported	In-hospital/discharge	Not reported	EBF , FF (based on a 5 likert scale where 1= EBF, 5=EFF	At discharge (NBC) Week 1 st Month 1 st	Not clear Self-reported (discharge and 1 st month)	Convenience N= 209 – recruitment at 1 st week	Mainly of Latin origin From Disadvantaged Area	US

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
									Chart review (1 st week)	RR-NA Follow up-156/209 (75%) after 4-6 weeks		
14	Linares <i>et al</i> 2015	Longitudinal	BSES	Reliability Cronbach α =0.90	1 st month	WHO	BF, EBF, FF	Discharge Month 1 st , 2 nd , 3 rd , 4 th	Not clear	Convenience/ 1 primary health care clinic N=100 (recruitment/ prenatally) N=72 (4months)	Urban Hispanic Mothers	US
15	McQueen <i>et al</i> 2015	Prospective cohort	BSES-SF	Reliability	In Hospital	Labbok & Krasovec	EBF, Almost EBF, High BF, Partial	In-hospital Weeks 4 th and 8 th	24 hr recalls	1 tertiary center and 1 rural	Aboriginal	Canada

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
				Cronbach α =0.95		's (1990)	BF, Token BF, FF			hospital N=132 RR=86%-130 2 EFF 105 (4 weeks) 102 (8 weeks)		
16	Petrozzi & Gagliardi 2016	Cohort	BSES-SF	Internal Consistency Cronbach α =0.92 M=54.8 (SD=9.4) Construct-Factor Analysis	In hospital (2-3 days)	WHO (2008)	Full BF(EBF+ Predominant BF), Partial BF, no BF	In Hospital Month 3 rd Phone interview	Not clear	Not reported/ 1 maternity clinic N=122 (2-3 days after birth) LF= not reported RR= not reported	NA	Italy

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	Author	Study Design	Tool	Psychometric	Point (s) of Measurement Number measured	BF operational Definition	Definitions Used	Point (s) of Measurement	Method of BF measurement (24 hour recall/retrospective)	Sample	Specific Sample Characteristics	Country
17	Hinic 2016	Descriptive correlational	BSES-SF	Cronbach α =0.95	In hospital (4 days)	No reported	FF	In Hospital	Not clear	Convenience N=107 RR=65%	NA	US

Table 6.3 (b): *Characteristics, analytical approach and main findings of Observational Studies that investigated the association of maternal Breastfeeding Self-Efficacy (MBFSE) with outcomes*

	Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ BFSE predictor, mediator, and/ or outcome	as	Main approach	analytical	Main adjustments	co-variates/	Main Findings
1	Baghurst et al 2007	IC: >= 18 years, >=37 weeks, BF intention, read and speak English, singleton, infant and mother not separated EC: multiple pregnancies, prolonged NICU	WHO/ UNICEF BFHI 'ten Steps to Successful BF' questionnaire	BFSE as a predictor of BF duration up to the 6 th month		Cox hazards analysis	proportional	Method of care, age, country of birth, language spoken at home, education, employment status, employment or not, type of profession, pension status, housing situation, living situation, smoking, partner's education, partner's employed or not, partner's employment status, intended BF duration,		An increase of BFSE associate with a reduction in weaning hazard by 28% .
2	O' Brien et al. 2008	<= 18 years Insufficient English language skills, mother or infant too ill, infant dead or separated from mother	Depression, Anxiety and Stress Scales (DASS-21), Rosenberg's Self-esteem, Hong' s Psychological Reactance Scale, Adaptability Scale from the International Personality Item Pool, Life Orientation Test,	BFSE a predictor of any BF and FBF		Spearman 's rho correlations between BF and FBF with BFSE Cox survival regression analysis		Education, occupation, BF experience, partner's experience, age, optimism, anxiety, faith in BF, BF expectation, planned duration, time of decision		BFSE a predictor of any BF at 6 months; 1 unit increase of BFSE associate with 5% and 2% increase of probability of BF and Full BF duration up to the 6 th month, respectively Spearman Rhr: 0.48 for EBF 0.46 for BF

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Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	BFSE as predictor, mediator, and/ or outcome	Main approach	analytical	Main adjustments	co-variates/	Main Findings
			Achievement Strivings Scale, Self-efficacy subscale from the Parenting Sense of Competence Scale						
3	Tsai <i>et al.</i> 2015	IC: primiparous, no medical problems, full term, healthy (>2.500gr, Apgar >= 8 for 5 mins)	Mandarin Health Literacy Scale (Breastfeeding knowledge)	Predictor of early cessation	Logistic Regression Analysis for EBF	Cox regression analysis	Maternal age, education, residence, job, BF initiation, prenatal classes, BF intention, health literacy, BF knowledge		EBF At hospital: 1.09 (95% CI 1.06, 1.13) 1 st month: 1.04 (95% CI 1.02, 1.07); 3rd month: 1.03 (95% CI 1.01, 1.06) Cessation of BF HR: 0.98 (0=95% 0.96, 0.99)
4	Semenic <i>et al.</i> 2008	>= 18 years Singleton, healthy, full term They or partner Speak and read English Maternal or infant health problems that interfere with BF initiation	Parental infant feeding beliefs (by both mothers and partners) (BF Beliefs and Bottle and feeding Beliefs scales Perceived infant satisfaction with BF (Maternal BF Evaluation Scale)	Predictor of EBF duration Mediator (perceived infant satisfaction+)	Mean BSE score difference between the 4 th month and hospital stay Mean BSE score change of BF/BF discontinuation (formula/ weaning) by 6 weeks and BF/weaning by 4months		Maternal age, education, maternal infant feeding beliefs, parental infant feeding beliefs, mode of delivery, EBF intention, formula at hospital, number of BF problems, prenatal class attendance		BSE indepentend predictor BSE mediator between many BF factors and BF (BF informational support, BF problems BF/ BSE associated with perceived BF

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Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	BFSE predictor, mediator, and/ or outcome	Main approach	analytical	Main adjustments	co-variates/	Main Findings
		Postpartum support Postpartum support Questionnaire			Cox proportional hazards regression modelling (model log-likelihood change)				problems at the clinic and at 6 weeks BSE positively associated with attitudes towards BF to formula/ partners' positive attitudes towards BF BSE associated with BF informational support at 4 months Formula supplementation inversely associated with BSE at hospital (EBF initiation)
5	Wilhelm <i>et al.</i> 2008	IC: 19-38 years BF for more than 2 weeks EC: NICU, <=37 weeks, <2, 500 gr, bilirubin > 15	Intention to BF for 6 months	BFSE predictor	Logistic regression analysis Secondary analysis to assess the effect of intention to BF and BSES on BF duration		NA????		BFSE at 2 weeks is a predictor of BF up to the 6 th month

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Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	as Main approach	analytical	Main adjustments	co-variates/	Main Findings
	mg/dl, mothers that stopped BF by 2 nd week							AdjOR: 1.04 p=0.03 (at 2 nd week) AdjOR: 0.99 p=0.768 (at discharge)
6	Mossman <i>et al.</i> 2008	IC: 15-19 years >= 34 weeks, singleton, contemplate BF EC at birth: ≤ 37 weeks, NICU, congenital abnormalities, apprehended at birth, adoption, birth Alert Notice, EFF	Breastfeeding Attitudes Questionnaire	BFSE predictor	% of BF initiation by BFSE score Kaplan Meier survival curve analysis to examine the association of prenatal BFSE scores and BF at 28 th day Cox regression analysis to examine the effect BFSE on BF duration	Prenatal BF attitudes, prenatal classes, smoking, living situation, planned duration of BF, supportive partner prenatally, timing of BF decision		Higher % of BF initiation among those with higher prenatal BFSE score Higher % of BF initiation and duration of at least 28 days among those with higher postnatal BFSE score <u>Prenatal BSES:</u> BF initiation: Yes Vs No: 52.5 (7.3) Vs 48.63 (8.75) p=0.063 Prevalence of BF initiation with BSES scores: 57.1% Vs Low BSES scores <u>Prevalence of BF at 28days</u> with prenatal

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Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/	BFSE predictor, mediator, and/or outcome	as	Main approach	analytical	Main adjustments	co-variates/	Main Findings
										BSES scores:66.67% Vs Low prenatal BSES scores 38.89% <u>Prevalence of BF at 28days</u> high postnatal BSES scores:69.5% Vs Low postnatal BSES scores 20.80% Prenatal HR: 2.22 (95% CI: 1.13, 4.17, P=0.02 HR: 4.19 (95% CI: 2.18-8.04, P=0.001 HR of quitting <28 days: 3.63 (95% CI: 1.85-7.13, P=0.001
7	McCarter - Spaulding & Gore 2009	IC: >=18 years Singleton Full term Speak English Intention to BF ,BF initiation of BF the first 24 hrs	Demographic Data Survey	BFSE as a predictor		Mean differences in scores at 1 st week by BF/ EBF status at 4 th week and 24 th week		NA		BSE at 1st week a strong predictor of BF duration up to the sixth month (HR: 0.96) BSE at 1st week a strong predictor of BF duration up to the 1st month (HR: 0.97)

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	Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	BFSE as predictor, mediator, and/ or outcome	Main approach	analytical adjustments	Main adjustments	co-variates/	Main Findings
		EC: Ill, preterm, factors that influence BF , <=18 years				time until weaned-analysis of breastfeeding duration				For an increased unit of BFSE, there is a decreased risk of weaning by 1 month postpartum Odds for EBF at 4 weeks = 1.05 for every unit increase of BFSE
8	Ku & Chow 2010	Read and speak in Chinese >=18 years Singleton, Healthy / no complications and congenital abnormalities	Breastfeeding Knowledge Questionnaire (BKQ)	BfSE predictor of BF/ EBF Outcome of demographic factors, biomedical factors,		Linear Regression of BFSE predictors on BFSE Logistic Regression BFSE on EBF	Information on BF from the internet, partner that “pie yue”, helper that “pie yue”, can Flat Owners, married, education			BFSE strong predictor of EBF up to the 6 th week
9	Zubaran & Foresti 2013	Speak and read Portuguese Health Singleton Any issue that interferes with BF (birth defects, high risk pregnancy, serious medical conditions)	Edinburgh Postpartum Depression Sale (EPDS) Postpartum Depression Screening Scale (PDSS) Socio-Economic Status Scale (SES)	Association		Mean differences of BSES between EBF and partial BF	NA			Higher BSES scores in EBF mothers in comparison with those partially BF EBF Vs Partial: 65.62 (4.04) Vs 56.6 (7.06); p<0.001

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	Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ tool	BFSE predictor, mediator, and/or outcome	as Main approach	analytical	Main adjustments	co-variates/	Main Findings
10	Loke & Chan 2013	IC: Intention to BF, NO postnatal Depression, Vaginal delivery, full term, >=2800kg , Apgar score >= 8 (1-5 mins) EC: <18 years, communicate in Cantonese, history of substance abuse, medical or obstretic problems, preterm, postnatal complications	Infant assessment (IBFAT)	BF tool	Predictor	Binary Logistic Regression Analysis Mean Scores of MBSES-SF between BF continuation and FF up to the 6 th weeks % of BF status based on BFSE scale item		age, birthplace, length of stay in Hong Kong, monthly income, need to return to work, planned duration of BF, No of infants admitted to NICU, occupation, IBFAT scores		EBF Vs Complementary Vs FF: 43.50 (8.9) Vs 36.3 (7.2) Vs 34.62 (8.8); p-value<0.001
11	Yu <i>et al</i> 2014	15-49 years 3 rd trimester Reside in the districts Reside <6 months the two districts (Katiadi, Kishoreganj) EC: congenital or chronic diseases	Breastfeeding Attrition Tool (BAPT) Breastfeeding Knowledge		BSES predictor	Binary regression	Logistic	EBF intention, attitude towards breastfeeding, BF knowledge, maternal age, parity, literacy, prenatal care, sub-district, household quintile		BSE not associated with EBF and Full BF at 3 months. EBF: AdjOR 0.99 (95% CI: 0.82, 1.20) Full BF: AdjOR 1.02 (95% CI: 0.83, 1.24)

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	Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	BFSE predictor, as	Main approach	analytical	Main adjustments	co-variates/	Main Findings
12	Koskinen <i>et al</i> 2014	>= 18 years old, healthy, could communicate in Finnish, singleton, no major obstetrical complications, healthy infant with no congenital abnormalities.	NA	Outcome		Differences in median BSES scores Between EBF, supplementation for medical reason and supplementation without medical reason		NA		Mothers whose infants supplemented In the hospital had lower BSES median scores than EBF mother Supplemetation for medical reason vs supplementation without medical reason avs EBF 54 (Q1-Q3: 48-57)vs 54 (Q1-Q3: 48-60)vs 59 (Q1-Q3: 54-63) p< 0.001 Primiparous 56 (Q1-Q3: 49-61) vs 57 (Q1-Q3: 51-62)vs 61 (Q1-Q3: 57-66) p< 0.001 Multiparous 53 (Q1-Q3: 48-57)vs 54 (Q1-Q3: 45-58)vs 59 (Q1-Q3: 52-60) p< 0.001

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	Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	BFSE predictor, as	Main analytical approach	Main adjustments	co-variates/	Main Findings
13	Glassman <i>et al.</i> 2014	Singleton Full term, English or Spanish	Short Acculturation Scale (SAS)	Predictor		Multivariable Linear Regression on the effect of BFSE on EBF Logistic Regression on the effect of BFSE on EBF	Maternal age, ethnicity, education, mean number of children,, previous BF experience for >= 6months, foreign born, level of acculturation, received fee formula, father prefers BF, maternal grandmother prefers BF, Medicaid, WIC		$\beta = 0.38$ (95% CI: 0.002, 0.05), adj OR= 1.18 (95% CI : 1.05, 1.32) Higher BFSE levels associated with more frequent BF and EBF at 4-6 weeks
14	Linares <i>et al.</i> 2015	Hispanic, >=16 years, healthy pregnancy >=20 weeks, give birth at a local hospital, intend to live in central Kentucky	Autonomy and Relatedness Inventory (ARI) Infant Feeding Intentions (IFI)	Predictor of EBF at 4 th month		Binary logistic regression at 4 th month Difference in BSES between mothers that continue to EBF and those that do not	Age, education, partner the most important person, ARI score, IFI score		Mothers with lower BFSE score at 1 st month more likely to cease EBF by the 4 th month For 1 unit increase of BFSE, Odds increase by 1.20, 95% CI: 1.07, 1.34; (5 units of BFSE increase , increase of Odds by 2.5 of EBF at 4 th Month 4 th month: EB Vs Other:157.6 (7.3) Vs 150.7 (11.7) p=0.083
15	McQueen <i>et al.</i> 2015	IC: initiated BF, singleton, infant discharged with mother, read and speak English, access to	Maternal Characteristics	Predictor		Difference of BSES-SF scores	NA		Higher BSES 48 hours at birth associated with higher probability of BF and even higher EBF, at 8 weeks

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Author	Eligibility Criteria	Other study variables/ measurement tools	main variables/ mediator, and/ or outcome	BFSE as predictor, mediator, and/ or outcome	Main approach	analytical	Main adjustments	co-variates/	Main Findings
	telephone; EC: factors that interfere with BF,)								OR= 1.8 p=0.004 for a 10 point increase of BSES at 8 weeks OR=2 .20, P=0.0001 for 10-point increment in BSES-scores
16	Petrozzi & Gagliardi 2016	Healthy baby, Willingness to speak Italian	Postpartum Depression (Edinburgh Postnatal Depression Scale)	Predictor of BF at 3 months	Predictive validity (ROC analysis) Multivariate log binomial analysis)		Postpartum depression, education, mode of delivery, baby gender, age, citizenship		BSES strong predictor B=2.4% (95% CI: 0.6, 4.2; p=0.007) of full BF for 1 unit of increase of BSE ROC area= 0.69 (sd=0.05)
17	Hinic 2016	Full term (>=39 wks) or late term (<42 wks) Intend to BF >=18 years Speak and read English	Perceived Stress Scale-10, Birth Satisfaction Scale-Revised	Outcome	Difference of BSES-SF scores Multiple regression	linear	Birth satisfaction, BF intention, likelihood of EBF for 6 months, partner support of BF, feeling prepared for childhood, previous BF experience, no of living children		In-hospital FF: M=39 (SD=11.37) Vs No in-hospital FF: 48.61 (SD=48.61); p-value<0.001 Formula Supplementation: B=-6.01; t=-2.60; p-value=0.011

Appendix C: Summary protocol of the “BrEaST start if life” project as submitted for approval by relevant authorities (in Greek)

Σκοπός: Η αξιολόγηση (α) της αυτοπεποίθησης των μητέρων για το θηλασμό, (β) των πρακτικών σίτισης στους πρώτους μήνες της ζωής του παιδιού και (γ) των απόψεων τους ως προς την εφαρμογή των «δέκα βημάτων» για επιτυχή θηλασμό στα μαιευτήρια της Κύπρου. Συμπληρωματικά, θα διερευνηθούν οι γνώσεις και στάσεις του νοσηλευτικού/μαιευτικού προσωπικού σε σχέση με το θηλασμό και οι δικές τους απόψεις τους για την εφαρμογή των «10 βημάτων».

Σχεδιασμός Μελέτης: Πρόκειται για συγχρονική περιγραφική μελέτη (αυτοπεποίθηση για το ΜΘ και απόψεις ως προς την εφαρμογή των «δέκα βημάτων» κατά τις πρώτες 48 ώρες) και διαχρονικής παρακολούθηση στον 1, 4 και 6 μήνα ζωής του παιδιού (πρακτικές σίτισης, αυτοπεποίθηση και κοινωνική στήριξη από το άμεσο και εργασιακό περιβάλλον).

Δείγμα-Δειγματοληψία: Διαδοχικό δείγμα μητέρων σε μαιευτικές μονάδες ιδιωτικού και δημόσιου τομέα ανά το Παγκύπριο κατά την περίοδο στρατολόγησης.

Ελάχιστο επιθυμητό μέγεθος δείγματος: 370.

Κριτήρια καταλληλότητας: για τις μητέρες: (1) >18 ετών, (2) καλή γνώση Ελληνικής ή Αγγλικής γλώσσας, (3) Υγιές τελειόμηνο μωρό (>37 εβδομ, Apgar score στα 5' >7, Βάρος $\geq 2500\text{g}$), χωρίς παθολογικά ή χειρουργικά προβλήματα, (4) οι ίδιες υγιείς (υγιείς μαστοί, όχι αμφοτερόπλευρη μαστεκτομή, επίπεδες ή εισέχουσες θηλές, χωρίς παθολογικές παθήσεις π.χ. διαβήτη, ψύχωση, κατάθλιψη). Για το προσωπικό: κυρίως, να έχουν εργαστεί σε αυτές τις μονάδες για τουλάχιστον 6 μήνες.

Διαδικασία Διεξαγωγής της μελέτης:

1. Εξασφάλιση άδειας από τη διεύθυνση κάθε μαιευτικής μονάδας. Τόσο για σκοπούς καταχώρησης όσο και για σκοπούς παρουσίασης των δεδομένων, οι μονάδες θα κωδικοποιηθούν.
2. Ενημερωτική επιστολή προς τις συμμετέχουσες και λήψη γραπτής συγκατάθεσης. Ξεχωριστή συγκατάθεση για τις δυο φάσεις της μελέτης, έτσι ώστε οι μητέρες να έχουν το δικαίωμα να συμμετάσχουν στην πρώτη φάση (κλινική – σημείο αναφοράς), αλλά όχι απαραίτητα και στη διαχρονική μελέτη αν δεν το επιθυμούν
3. Οι ερευνητές-πεδίου (απόφοιτοι νοσηλευτικής/μαιευτικής) θα εκπαιδευτούν ειδικά ως προς τις δεξιότητες επικοινωνίας. Το πρόγραμμα των επισκέψεων θα καθορίζεται σε πλήρη συνεννόηση με το προσωπικό της μονάδας. Σε περίπτωση που η μητέρα δηλώνει πρόθεση να συμμετάσχει, αλλά η συγκεκριμένη στιγμή δεν είναι βολική, τότε θα καθορίζεται άλλη ημέρα/ώρα με ραντεβού.
4. Η συλλογή των δεδομένων από τις μητέρες στο σημείο αναφοράς θα γίνει με τη χρήση ανώνυμου αυτοσυμπληρούμενου ερωτηματολογίου πριν το εξιτήριο. Τα κωδικοποιημένα έντυπα συγκατάθεσης θα συγκεντρώνονται και θα φυλάγονται ξεχωριστά από τα κωδικοποιημένα ανώνυμα ερωτηματολόγια σε κλειδωμένο συρτάρι στους χώρους του Πανεπιστημίου, όπου πρόσβαση θα έχουν μόνο τα μέλη της κύριας ερευνητικής ομάδας, .
5. Παράλληλα, θα δοθεί αυτοσυμπληρούμενο ανώνυμο ερωτηματολόγιο στο μαιευτικό/νοσηλευτικό προσωπικό των μονάδων το οποίο θα συγκεντρώνεται σε κλειστούς σφραγισμένους φακέλους με τη μέθοδο της κάλπης στο χώρο της κλινικής.
6. Με όσες μητέρες δήλωσαν επιθυμία να συμμετέχουν και στην επόμενη φάση της μελέτης, θα υπάρξει επικοινωνία (είτε τηλεφωνική είτε μέσω ηλεκτρονικού ταχυδρομείου αναλόγως της δικής τους επιλογής) κατά τον 1 (αυτεπάρκεια σε σχέση με το θηλασμό), 4 (κοινωνική στήριξη στη φροντίδα του μωρού) και 6 μήνα μετά το εξιτήριο (στήριξη στον εργασιακό χώρο).
7. Σε κάθε συνέντευξη θα ζητηθούν πληροφορίες σχετικά με τις πρακτικές σίτισης.

Εργαλεία μέτρησης: Για τη συλλογή των δεδομένων θα χρησιμοποιηθούν τα πιο κάτω εργαλεία/κλίμακες για τα οποία έχει ήδη εξασφαλιστεί άδεια μετάφρασης (αν δεν υπήρχε) και χρήσης τους.

Αυτοαξιολόγηση της εφαρμογής των «10 βημάτων»: Αποτελεί μέρος πακέτου εργαλείων για αυτοαξιολόγηση και παρακολούθηση των «Νοσοκομείων, Φιλικών προς τα βρέφη» του WHO και της UNICEF (UNICEF & WHO, 2006). Συγκεκριμένα, θα χρησιμοποιηθεί το ερωτηματολόγιο που απευθύνεται στις μητέρες κατά το εξιτήριο και το αντίστοιχο που απευθύνεται στο προσωπικό.

Γνώσεις και στάσεις για τον θηλασμό: Αποτελείται από 20 ερωτήσεις 5-βάθμιας κλίμακας Likert (διαφωνίας-συμφωνίας), όπου οι 7 από αυτές αφορούν σε γνώσεις και οι υπόλοιπες 13 αφορούν σε στάσεις των επαγγελματιών υγείας για τον μητρικό θηλασμό και αποτελεί συντομευμένη έκδοχή (Ingram, 2006) του επικυρωμένου εργαλείου που χρησιμοποιήθηκε από τους Scott et al (2003) σε έρευνα με μαίες στη Σκωτία.

Αυτεπάρκεια για θηλασμό: Σύντομη έκδοση της αρχικής κλίμακας breastfeeding-self-efficacy scale των Dennis & Faux (1999) με 14 θετικές δηλώσεις ξεκινώντας με τη φράση «μπορώ πάντα», η οποία μετρά την αντιλαμβανόμενη αυτοπεποίθηση της μητέρας στο θηλασμό. Έχει χρησιμοποιηθεί για αυτό το σκοπό σε πολλές χώρες του κόσμου αφού θεωρείται ότι η χαμηλή αυτοπεποίθηση είναι σημαντικός προγνωστικός παράγοντας πρόωρης διακοπής του ΜΘ.

Αντιλαμβανόμενη κοινωνική στήριξη: Θα χρησιμοποιηθεί το ερωτηματολόγιο *Perinatal Infant Care Social Support Scale* της Leahy- Warren, 2005, το οποίο είναι βασισμένο στην θεωρία της κοινωνικής ανταλλαγής και της κοινωνική στήριξης. Αναφέρεται τόσο στη λειτουργική όσο και στη δομική κοινωνική στήριξη με 16 δηλώσεις κλίμακας Likert Διαφωνίας–Συμφωνίας τεσσάρων σημείων ως προς τις τέσσερις πτυχές της στήριξης: (α) παροχή πληροφόρησης, (β) απτή βοήθεια, (γ) συναισθηματική στήριξη και (δ) εκτίμηση και αναγνώριση.

Στήριξη του θηλασμού στον εργασιακό χώρο: Θα χρησιμοποιηθεί η κλίμακα *Workplace Breastfeeding Support* (Bai et al, 2008) η οποία αποτελείται από 12 δηλώσεις σε κλίμακα

Likert επτά σημείων ως προς την αντιλαμβανόμενη στήριξη της θηλάζουσας μητέρας μετά την επιστροφή της στην εργασία

Πρακτικές σίτισης: Στη κάθε επικοινωνία, οι μητέρες θα ερωτηθούν για τις πρακτικές τους σε σχέση με το θηλασμό ή/και τη σίτιση του μωρού τις 24 τελευταίες ώρες (24h recall method) ενώ θα τους ζητηθεί επίσης να δηλώσουν αν και πότε έχουν εισαγάγει υγρά ή στερεά τροφή στη διατροφή του παιδιού (retrospective event calendar method). Γι' αυτό το σκοπό θα χρησιμοποιηθεί πολιτισμικά προσαρμοσμένος πίνακας διατροφικών ομάδων/προϊόντων.

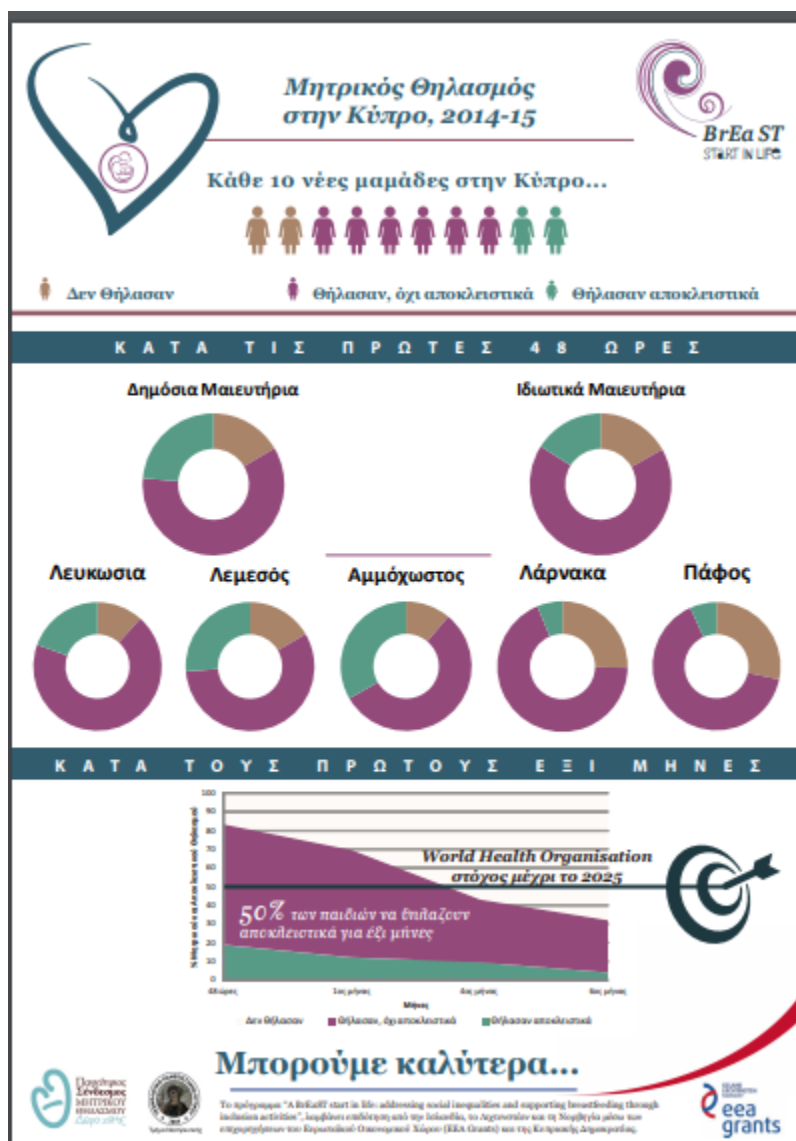
Κοινωνικο-δημογραφικά χαρακτηριστικά: Θα ζητηθούν πληροφορίες όσον αφορά σε δημογραφικά και κοινωνικο-οικονομικά χαρακτηριστικά των μητέρων – οικογενειακή κατάσταση, οικογενειακό εισόδημα, αριθμός παιδιών και προηγούμενες εμπειρίες σε σχέση με το θηλασμό, παράγοντες οι οποίοι θεωρούνται στη βιβλιογραφία σημαντικοί προσδιοριστές της διάρκειας ή πρόωρης διακοπής του μητρικού θηλασμού.

Appendix D: Informative Material for the public on the Main Findings of Study

(a) The '10 Steps'



(b) Breastfeeding in Cyprus, 2014--2015



Appendix E: Policy document with “key recommendations” as prepared for the BrEaST start in life programme

Key recommendations	
Further promotion of National Committee’s Strategy/Policy on Breastfeeding: institutionalization of the 10 steps and the Code as "minimum standard of good practice” Promotion (encouragement, incentives, and aid for maternity units to develop breastfeeding policy (written, communicated on a systematic basis to all staff (health professionals and others) who come in contact with the nursing mother, available & posted in summary to mothers/families) Development of mechanism for assessing maternity unit practices (immediate at least within the public sector) and procedures for self-improvement Encouragement and incentives for the certification of maternity hospitals as "Baby-Friendly". Identify and aim for at least one public sector maternity hospital to be certified as “Baby-Friendly”. Reorganization of structures and services, especially for the provision of care and support in the postnatal period (e.g. establishment of Community Midwifery). Aim to train Certified Lactation Consultants: Adopt relevant incentives. Coordination of actions among all involved parties and stakeholders both in terms of developing and organizing inter-disciplinary educational and training activities as well as in terms of aligning and harmonizing positions and beliefs and adopting active advocacy for breastfeeding.	Policy, Planning, Management, Funding

Development of a recording and monitoring system for breastfeeding, both in terms of breastfeeding indicators as well as the maternity clinic practices, in the context of self-improvement and for providing a base for assessing the effectiveness of policies, actions and interventions (e.g. operating within the Health Monitoring Unit, MoH for the public sector as well as surveys at routine intervals with the support of the Statistical Office) Adoption of specific, measurable and achievable targets (and associated indicators), and set timeframe for achieving target and assessing progress at intermediate intervals Design and implantation of specific actions and appropriate evidence-based interventions, including evaluation for their effectiveness at regular intervals and relevant feedback with regards to necessary modifications and improvements	Recording & Monitoring System
Strengthen research on breastfeeding (and related issues) and establishment / enrichment of evidence-base regarding the social, historical and cultural factors related/responsible for low breastfeeding rates, in order to identify obstacles and barriers. In-depth investigation of these issues in studies with qualitative and / or mixed-method methodology in order to understand the different dimensions and aspects of the problem but also to inform the design of targeted and culturally-appropriate interventions. Foster synergies between government / involved parties and bodies with academic institutions in order to promote breastfeeding research Identify low breastfeeding rates as priority issue for public health and develop appropriate internal funding mechanisms for breastfeeding research Design, implementation and evaluation of complex multi-level interventions, feedback on effectiveness, cultural adaptation, redesign / reformulation	Research

Strengthen health professional education and training: establish partnerships between related agencies and academic institutions, co-organize seminars and workshops, evaluating the effectiveness of related activities and apply changes/improvements through feedback Mandatory continuing education on breastfeeding as part of broader policy of maternity clinics: adopt mechanisms to ensure opportunities for health professionals to attend, as well as create opportunities for training other staff in maternity clinics who come in contact with mothers Introduce and / or strengthen if already in place, breastfeeding education (incl. benefits, management etc) in the clinical education curriculum at educational institutions (i.e. midwifery and nursing students, medical students, pediatric and obstetrics specialists) Identify/create opportunities to promote interdisciplinary learning both among registered professionals (e.g. pediatricians, gynecologists, midwives, nurses) as well as among clinical students (and future health professionals) with appropriate textbooks based on the latest research evidence.	Information, Training, Education Health Professionals

Active promotion and strengthening of education & training to pregnant mothers (and their families) in prenatal period (e.g. seminar series organized by public maternity hospitals and / or private hospitals) by adequately trained health professionals, lactation consultants, and breastfeeding mothers Family-centred educational programmes with the active participation of fathers as well as other family members, identify or create additional opportunities for families to attend seminars and develop new sources of informational support (through professional associations, ehealth platforms, chat groups) Develop educational and/or support programs, of a systematic nature and structured format (not individual sessions / lectures), not restricted to prenatal, but also more importantly in the postnatal period, covering a wide range of issues both in terms of the benefits and management of breastfeeding, as well as on the psycho-social dimension to support and strengthen the mother and the whole family, boosting confidence/self-efficacy and building support mechanisms within the family Build-in workshop sessions on practical aspects of breastfeeding (positioning and management) as well as informational/ emotional support in the postnatal period Develop existing structures and actions, and create further opportunities with the use of technology (e.g. hotline, internet platform / forum) in order to provide valid information (and combat confusing messages/myths around breastfeeding) in prenatal and postnatal period Actively promote the establishment of formal services (e.g. Community Midwifery) and informal support networks involving peer and/or lay support groups (breastfeeding mothers or lay volunteers) with or without the participation of health professionals. Development of broader actions / activities on the basis of evidence-based practices for the promotion, protection and support of breastfeeding in the	Information, Training, Education Mothers and Families

community, design, implement and evaluate culturally-appropriate interventions/policy actions by adapting best available practices elsewhere: education and/or support programs, on an individual and/or group basis, with formal and/or informal support. Identify and strengthen existing resources/actors and further promote the work of non-governmental organizations and advocacy support breastfeeding.	

Redefine the problem as a priority Public Health issue, and therefore a societal problem Adopt an integrated socio-ecological approach both in terms of understanding the determinants of breastfeeding as well as in the context of developing policy actions and designing multi-level interventions addressing mother and family, the wider social and work environment and broader policies. Adopt targeted policies towards vulnerable groups and address social inequalities in breastfeeding by creating equal opportunities for mothers/families in adverse conditions and circumstances in partnership with the social services / Department of Labour (e.g. financial aid, home child care / support) Ensure alignment of positions and beliefs among bodies, organizations and their members (within and outside the health system) in order to combat contradictory information and convoluted messages, fragmented care and/or confusing policies Coordinated actions of stakeholders to further promote/enhance the visibility of breastfeeding and strengthen public advocacy for breastfeeding Build wider network of supporters/advocates from organizations, associations, citizens' organizations and individuals in the public sphere Develop effective communication policy with the participation of people from the public sphere in awareness campaigns and advocacy for breastfeeding Strengthen civic engagement with the involvement of civil society towards actions that aim to further promote the visibility of breastfeeding e.g. "Baby-Friendly" restaurants, cafes, businesses and public places. Nationwide awareness campaigns to further highlight the problem, redefine societal values, and offsetting negative perceptions and attitudes towards breastfeeding Secure the support of labour/union organizations and commitment of employers in ensuring supportive conditions at work and/or specific arrangements after return to work Harmonization of labour legislation and other state policies to achieve these objectives	Beyond the health care system

Incorporate educational seminars, workshops and activities on and related to breastfeeding in the school curricula (primary, secondary and tertiary education) in order to cultivate a breastfeeding-friendly culture from an early age	

Appendix F: Signed Letter of Confirmation

Μαίρη Οικονόμου
Βραγαδίνου 15, 3041,
Λεμεσός
E-
mail:mc.economou@edu.cut.ac.
cy

15 Σεπτεμβρίου, 2014

Διευθυντή Μαιευτικής και Γυναικολογικής Κλινικής.....

Κύριε,

ΘΕΜΑ: Άδεια πρόσβασης για διεξαγωγή έρευνας

Ονομάζομαι Μαίρη Οικονόμου και είμαι υποψήφια Διδάκτορας στο Τμήμα Νοσηλευτικής του Τεχνολογικού Πανεπιστημίου Κύπρου. Στα πλαίσια προώθησης, προαγωγής και υποστήριξης του μητρικού θηλασμού στην Κύπρο, έθεσα σαν αντικείμενο έρευνας της μεταπτυχιακής μου εργασίας την αξιολόγηση της αυτοπεποίθησης των μητέρων για το μητρικό θηλασμό και τη διερεύνηση των απόψεων τους ως προς την εφαρμογή των «Δέκα Βημάτων» του Παγκόσμιου Οργανισμού Υγείας για την επιτυχία του θηλασμού.

2. Για την πραγματοποίηση του πιο πάνω στόχου βοηθοί ερευνητές, ειδικά εκπαιδευμένοι, θα χρειαστεί να επισκεφτούν όλα τα μαιευτήρια της Κύπρου, δημόσιου και ιδιωτικού τομέα, τον Σεπτέμβριο - Νοέμβριο 2014. Οι επισκέψεις στη μαιευτική κλινική θα πραγματοποιούνται για 3 ή 4 εβδομάδες σε τακτά χρονικά διαστήματα μετά από συνεννόηση με την υπεύθυνη μαία του μαιευτηρίου, ώστε να δοθεί στις μητέρες το σχετικό ερωτηματολόγιο.

3. Η έρευνα επικροτείται από την Εθνική Επιτροπή Μητρικού Θηλασμού και έχει τύχει έγκρισης από την Εθνική Επιτροπή Βιοηθικής Κύπρου, τον Επίτροπο Προστασίας Προσωπικών Δεδομένων και την Επιστημονική Επιτροπή Προώθησης Ερευνών του Υπουργείου Υγείας. Αντίγραφο των σχετικών εγκρίσεων επισυνάπτονται για δική σας ενημέρωση.

4. Ασφαλώς θα διατηρηθεί και διασφαλιστεί εχεμύθεια και ανωνυμία τόσο της μαιευτικής κλινικής όσο και των μητέρων. Το όνομα της μαιευτικής κλινικής δεν θα αναφερθεί, ούτε αποτελεί στόχο της μελέτης. Τα συμπληρωμένα ερωτηματολόγια θα συλλέγονται από τους βοηθούς ερευνητές. Μετά την ολοκλήρωση της συλλογής και ανάλυσης των δεδομένων της έρευνας, τα ερωτηματολόγια

Appendices

θα καταστραφούν. Τα αποτελέσματα της έρευνας, εφ' όσον το επιθυμείτε, θα σας κοινοποιηθούν με σκοπό την ανατροφοδότηση και την πιθανή βελτίωση των παρεχόμενων υπηρεσιών.

5. Η θετική ανταπόκριση σας θα συμβάλει στην υλοποίηση της προσπάθειας για την εξακρίβωση των δεδομένων που επικρατούν στη χώρα μας και στην περαιτέρω ανάληψη διορθωτικών ενεργειών με στόχο την επαναφορά του μητρικού θηλασμού ως αποκλειστικής τροφής του βρέφους, για τους πρώτους έξι μήνες της ζωής του. Είστε ελεύθερος να αποσύρετε οποιαδήποτε στιγμή τη συγκατάθεση για τη συμμετοχή σας στην έρευνα, χωρίς καμιά υποχρέωση εκ μέρους σας.

6. Παρακαλώ αν συμφωνείτε και αποδέχεστε, η μαιευτική μονάδα της οποίας προΐστασθε, να συμμετέχει στη συγκεκριμένη έρευνα να υπογράψετε την πιο κάτω δήλωση.

Σας ευχαριστώ,

Μαίρη Οικονόμου

Αποδέχομαι να συμμετέχει η Μαιευτική Κλινική στην αναφερόμενη έρευνα με τους όρους που προαναφέρθηκαν.

Όνομα:

Υπογραφή:

Appendix G: Consent Form signed by the mothers

ΕΝΤΥΠΙΑ ΣΥΓΚΑΤΑΘΕΣΗΣ για συμμετοχή σε πρόγραμμα έρευνας (Τα έντυπα αποτελούνται συνολικά από 4 σελίδες)

Καλείστε να συμμετάσχετε σε ένα ερευνητικό πρόγραμμα. Πιο κάτω (βλ. **«Πληροφορίες για Εθελοντές» όπως επίσης και ενημερωτική επιστολή**) θα σας δοθούν εξηγήσεις σε απλή γλώσσα σχετικά με το τι θα ζητηθεί από εσάς ή/και τι θα σας συμβεί σε εσάς, εάν συμφωνήσετε να συμμετάσχετε στο πρόγραμμα. Θα σας περιγραφούν οποιοδήποτε κίνδυνοι μπορεί να υπάρξουν ή ταλαιπωρία που τυχόν θα υποστείτε από την συμμετοχή σας στο πρόγραμμα. Θα σας επεξηγηθεί με κάθε λεπτομέρεια τι θα ζητηθεί από εσάς και ποιος ή ποιοι θα έχουν πρόσβαση στις πληροφορίες ή/και άλλο υλικό που εθελοντικά θα δώσετε για το πρόγραμμα. Θα σας δοθεί η χρονική περίοδος για την οποία οι υπεύθυνοι του προγράμματος θα έχουν πρόσβαση στις πληροφορίες ή/και υλικό που θα δώσετε. Θα σας επεξηγηθεί τι ελπίζουμε να μάθουμε από το πρόγραμμα σαν αποτέλεσμα και της δικής σας συμμετοχής. Επίσης, θα σας δοθεί μία εκτίμηση για το όφελος που μπορεί να υπάρξει για τους ερευνητές αυτού του προγράμματος. **Δεν πρέπει να συμμετάσχετε, εάν δεν επιθυμείτε ή εάν έχετε οποιουσδήποτε ενδοιασμούς που αφορούν την συμμετοχή σας στο πρόγραμμα.** Εάν αποφασίσετε να συμμετάσχετε, πρέπει να αναφέρετε εάν είχατε συμμετάσχει σε οποιοδήποτε άλλο πρόγραμμα έρευνας μέσα στους τελευταίους 12 μήνες. Εάν αποφασίσετε να μην συμμετάσχετε και είστε ασθενής, η θεραπεία σας δεν θα επηρεαστεί από την απόφασή σας. **Είστε ελεύθεροι να αποσύρετε οποιαδήποτε στιγμή εσείς επιθυμείτε την συγκατάθεση για την συμμετοχή σας στο πρόγραμμα.** Εάν είστε ασθενής, η απόφασή σας να αποσύρετε την συγκατάθεση σας, δεν θα έχει οποιεσδήποτε επιπτώσεις στην θεραπεία σας. Έχετε το δικαίωμα να υποβάλετε τυχόν παράπονα ή καταγγελίες, που αφορούν το πρόγραμμα στο οποίο συμμετέχετε, προς την Επιτροπή Βιοηθικής που ενέκρινε το πρόγραμμα ή ακόμη και στην Εθνική Επιτροπή Βιοηθικής Κύπρου.

Πρέπει όλες οι σελίδες των εντύπων συγκατάθεσης να φέρουν το ονοματεπώνυμο και την υπογραφή σας.

Σύντομος Τίτλος του Προγράμματος στο οποίο καλείστε να συμμετάσχετε
«Η αυτοπεποίθηση των μητέρων στο μητρικό θηλασμό, πρακτικές σίτισης μέχρι και τον έκτο μήνα και οι απόψεις των ιδίων και του προσωπικού των μαιευτηρίων για την εφαρμογή των δέκα βημάτων για επιτυχή θηλασμό στα μαιευτήρια της Κύπρου»
Υπεύθυνος του Προγράμματος στο οποίο καλείστε να συμμετάσχετε

Μαίρη Οικονόμου, Υποψήφια Διδάκτορας, Τμήμα Νοσηλευτικής, ΤΕΠΙΑΚ

Επίθετο:	.....	Όνομα:	.....
Υπογραφή:		Ημερομηνία:	

ΕΝΤΥΠΑ ΣΥΓΚΑΤΑΘΕΣΗΣ για συμμετοχή σε πρόγραμμα έρευνας (Τα έντυπα αποτελούνται συνολικά από 4 σελίδες)
Σύντομος Τίτλος του Προγράμματος στο οποίο καλείστε να συμμετάσχετε
«Η αυτοπεποίθηση των μητέρων στο μητρικό θηλασμό, πρακτικές σίτισης μέχρι και τον έκτο μήνα και οι απόψεις των ιδίων και του προσωπικού των μαιευτηρίων για την εφαρμογή των δέκα βημάτων για επιτυχή θηλασμό στα μαιευτήρια της Κύπρου»

Δίδετε συγκατάθεση για τον εαυτό σας ή για κάποιο άλλο άτομο;	
Εάν πιο πάνω απαντήσατε για κάποιον άλλο, τότε δώσετε λεπτομέρειες και το όνομα του.	

Ερώτηση	ΝΑΙ ή ΟΧΙ
Συμπληρώσατε τα έντυπα συγκατάθεσης εσείς προσωπικά;	
Τους τελευταίους 12 μήνες έχετε συμμετάσχει σε οποιοδήποτε άλλο ερευνητικό πρόγραμμα;	
Διαβάσατε και καταλάβατε τις πληροφορίες για ασθενείς ή/και εθελοντές;	
Είχατε την ευκαιρία να ρωτήσετε ερωτήσεις και να συζητήσετε το Πρόγραμμα;	
Δόθηκαν ικανοποιητικές απαντήσεις και εξηγήσεις στα τυχόν ερωτήματά σας;	
Καταλαβαίνετε ότι μπορείτε να αποσυρθείτε από το πρόγραμμα, όποτε θέλετε;	
Καταλαβαίνετε ότι, εάν αποσυρθείτε, δεν είναι αναγκαίο να δώσετε οποιεσδήποτε εξηγήσεις για την απόφαση που πήρατε;	

(Για ασθενείς) καταλαβαίνετε ότι, εάν αποσυρθείτε, δεν θα υπάρξουν επιπτώσεις στην τυχόν θεραπεία που παίρνετε ή που μπορεί να πάρετε μελλοντικά;	
Συμφωνείτε να συμμετάσχετε στο πρόγραμμα;	
Με ποιόν υπεύθυνο μιλήσατε;	

Επίθετο:	..... ...	Όνομα:	..... .....
Υπογραφή:		Ημερομηνία:	

ΕΝΤΥΠΑ ΣΥΓΚΑΤΑΘΕΣΗΣ για συμμετοχή σε πρόγραμμα έρευνας (Τα έντυπα αποτελούνται συνολικά από 4 σελίδες)
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ΠΛΗΡΟΦΟΡΙΕΣ ΓΙΑ ΕΘΕΛΟΝΤΕΣ

Η παρούσα ερευνητική μελέτη στοχεύει να διερευνήσει την αυτοπεποίθηση των μητέρων για το μητρικό θηλασμό και τις απόψεις τους ως προς την εφαρμογή των «δέκα βημάτων» για επιτυχή μητρικό θηλασμό στα μαιευτήρια της Κύπρου. Αποτελεί μέρος ενός ευρύτερου ερευνητικού προγράμματος με ευρωπαϊκή χρηματοδότηση με το όνομα «A BrEaST start in life» που διεξάγεται από το Τεχνολογικό Πανεπιστήμιο Κύπρου σε συνεργασία με τον Παγκύπριο Σύνδεσμο Μητρικού Θηλασμού – «Δώρο Ζωής».

Θα σας ζητηθούν πληροφορίες για κάποια δημογραφικά σας στοιχεία και να απαντήσετε σε αυτό-συμπληρούμενο ερωτηματολόγιο που έχει χρησιμοποιηθεί σε παρόμοιες μελέτες διεθνώς. Συγκεκριμένα, θα ερωτηθείτε για τις εμπειρίες σας σε σχέση με την εφαρμογή των «δέκα βημάτων», ορισμένων δηλαδή πρακτικών που προτείνονται από τον Παγκόσμιο Οργανισμό Υγείας και την UNICEF με στόχο τον επιτυχή θηλασμό. Επίσης, θα ερωτηθείτε σε σχέση με την αυτοπεποίθησή σας για το θηλασμό. Η διαδικασία αυτή υπολογίζεται να κρατήσει περίπου 15-20 λεπτά και σας παρακαλούμε να αφιερώσετε λίγο χρόνο, αφού η συμμετοχή σας στην επιτυχία της έρευνας είναι ουσιαστική.

Η συμμετοχή σας είναι εθελοντική και ανώνυμη και θα τηρηθούν όλοι οι κανόνες εμπιστευτικότητας και διαφύλαξης προσωπικών δεδομένων. Ενδιαφέρον έχει το σύνολο των απαντήσεων των 400 μητέρων οι οποίες θα λάβουν μέρος στην έρευνα και όχι οι απαντήσεις της κάθε μητέρας ξεχωριστά. Έχετε το δικαίωμα να διακόψετε τη συμπλήρωση των ερωτηματολογίων οποτεδήποτε το θελήσετε. Τα δημογραφικά σας στοιχεία, όπως και τα ερωτηματολόγια θα χρησιμοποιηθούν αποκλειστικά για τις ανάγκες της παρούσας έρευνας και θα έχουν πρόσβαση σε αυτά μόνο η ερευνήτρια και η ερευνητική ομάδα. Μετά την ανάλυσή τους, τα δεδομένα θα καταστραφούν.

Επίθετο:	.....	Όνομα:	..... .....
Υπογραφ ή:		Ημερομηνία:	

ΕΝΤΥΠΑ ΣΥΓΚΑΤΑΘΕΣΗΣ για συμμετοχή σε πρόγραμμα έρευνας (Τα έντυπα αποτελούνται συνολικά από 4 σελίδες)
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ΠΛΗΡΟΦΟΡΙΕΣ ΓΙΑ ΕΘΕΛΟΝΤΕΣ, συνέχεια:

Πέραν από την σημερινή συμμετοχή σας στην έρευνα, θα θέλαμε την έγκρισή σας να επικοινωνήσουμε είτε τηλεφωνικά είτε μέσω ηλεκτρονικού ταχυδρομείου (email) μαζί σας στους επόμενους μήνες αφού είναι σημαντικό να καταγράψουμε τις εμπειρίες σας με το θηλασμό σε βάθος χρόνου. Αν θέλετε να συμμετάσχετε και στο επόμενο στάδιο της έρευνας, παρακαλώ υπογράψετε και σ' αυτή την σελίδα, αφού πρώτα συμπληρώσετε τα στοιχεία επικοινωνίας στο πλαίσιο που ακολουθεί. **Η δήλωση συγκατάθεσης (με τα στοιχεία επικοινωνίας) θα μπαίνει σε ξεχωριστό φάκελο από τους βοηθούς ερευνητές. Στο ερωτηματολόγιο δεν θα αναγράφονται τα προσωπικά σας στοιχεία.**

Έχετε το δικαίωμα να διακόψετε τη συμμετοχή σας στην έρευνα οποτεδήποτε το θελήσετε. Τα στοιχεία που θα δώσετε θα χρησιμοποιηθούν αποκλειστικά για τις ανάγκες της έρευνας και θα καταστραφούν μετά την ανάλυση των δεδομένων. Πρόσβαση σε αυτά θα έχουν μόνο η βασική ερευνήτρια και τα μέλη της κύριας ερευνητικής ομάδας.

Στοιχεία επικοινωνίας

Τηλ
ή/και

Επίθετο:	.....	Όνομα:	..... ...
Υπογραφή: ή:		Ημερομηνία:	

CONSENT FORM

For Participation in a Research Study

(These documents consist of 4 pages)

You are requested to participate in a research program. Below (please see "**Information for Patients and/or Volunteers**") you will be provided with all the details and explanations, in simple language, regarding your participation in the study and what may happen to you, if you agree to participate. All the dangers concerning your health and rights, resulting from your participation in the study, will be explained to you in full detail. In addition, you will be warned for any possible discomfort that you may suffer. You will be informed on the information and/or material that you will be asked to provide voluntarily for the study and who will have access to this information and material. The duration, for which the investigators will have access to the information and/or material that you will provide, will be specified to you. The aims of the study, will be explained and what is hoped to be achieved as a result of your participation. Also, the benefits of the investigators and the financial sponsors, that may result from the study, will be outlined. **You should not consent to participate in the study should you have any doubts concerning the study and your health and rights. You should not consent to participate if the study if you find it unclear.** Should you decide to participate, you must provide information and details on whether you participated in any other research study within the last 12 months. Furthermore, if you decide to participate and you are a patient, your treatment will not be altered nor affected by your decision. **You are free to withdraw from the study at any time you wish.** If you are a patient, your decision to withdraw from the study, will have absolutely no repercussions on your present or future treatment. If you participate in the study, you are free to file substantiated complaints on any aspect or against any investigator of the study. These complaints may be filed/reported to the Ethics Committee that approved the study or directly to the Cyprus National Bioethics Committee.

All the pages of these consent documents should bare your name and signature.

Short title of the Program you are asked to participate
BrEaST start in life: «Assessment of mothers' breastfeeding self-efficacy (confidence) and their views on the implementation of the "ten steps" for successful breastfeeding in maternity units in the Republic of Cyprus»
Principal Investigator of the Program you are asked to participate
Mary Economou, Coordinator & Main Researcher "BrEaST" research programme, PhD candidate, Department Nursing, School of Health Sciences, Cyprus University Technology

Last name:	.....	First name:	.....
Signature:		Date:	

CONSENT FORM For Participation in a Research Study (These documents consist of 4 pages)
Short title of the Program you are asked to participate
BrEaST start in life: «Assessment of mothers’ breastfeeding self-efficacy (confidence) and their views on the implementation of the “ten steps” for successful breastfeeding in maternity units in the Republic of Cyprus»

Are you providing consent for yourself or someone else?	
If you are providing consent for someone else give details and his/her name.	

Question	Yes or No
Did you complete the consent documents your self?	
Within the last 12 months, did you participate in any other research study?	
Did you read and fully understand the information provided regarding the Study?	
Did you have a chance to ask questions you may have regarding the Study?	
Did you receive adequate answers and explanations to your questions?	
Do you understand that you can withdraw from the study at any time you wish?	
Do you understand that, should you withdraw from the study you do not have to provide any explanation for your decision to any one?	
Do you understand that, should you withdraw from the study there will be no consequences on possible therapeutic treatment you are receiving or may receive in the future?	
Do you agree to participate in the Study?	
With whom did you meet and discuss the study?	

Last name:	.....	First name:	.....
Signature:		Date:	

CONSENT FORM

For Participation in a Research Study

(These documents consist of 4 pages)

Short title of the Program you are asked to participate

BrEaST start in life: «Assessment of mothers' breastfeeding self-efficacy (confidence) and their views on the implementation of the “ten steps” for successful breastfeeding in maternity units in the Republic of Cyprus»

INFORMATION FOR VOLUNTEERS

This study aims to investigate mothers' breastfeeding self-efficacy (confidence) as well as their views on the implementation of the “ten steps” for successful breastfeeding in maternity clinics across Cyprus. It is part of a larger research program entitled «A BrEaST start in life» - a collaboration between the Cyprus University of Technology and the Cyprus Association of Breastfeeding “Gift for Life”, and is funded by European grants.

You will be requested to complete a self-administered questionnaire, which has been widely used in similar studies internationally, and provide some basic demographic data. Specifically, you will be asked about your experience regarding the implementation of the “10 steps” practices, as recommended by the World Health Organization (WHO) and UNICEF for successful breastfeeding. You will also be asked to fill in a short questionnaire about your confidence with breastfeeding. This process should not last more than 15-20 minutes. We would greatly appreciate it if you could spare some time since your participation is vital for the success of the study.

Your participation in the study is voluntary and anonymous. The study has secured all necessary approvals and is in compliance with all rules of confidentiality, privacy and safeguarding of personal data. The aim is to gather and summarize the responses of a total sample of 400-500 participating mothers; the focus is not on the distinct answers of each mother separately. You have the right to interrupt the completion of the questionnaire if you wish to do so and you can withdraw from the study at any time you wish. The data will be used exclusively for this study. Only the members of the core researcher team will have access to the data. The questionnaires will be destroyed once the data have been analysed.

Last name:	.....	First name:	.....
Signature:		Date:	

CONSENT FORM For Participation in a Research Study (These documents consist of 4 pages)
Short title of the Program you are asked to participate
BrEaST start in life: «Assessment of mothers’ breastfeeding self-efficacy (confidence) and their views on the implementation of the “ten steps” for successful breastfeeding in maternity units in the Republic of Cyprus»

INFORMATION FOR VOLUNTEERS *continued*

Other than today’s participation to the research project, we would like your permission to contact you by phone or e-mail in the next few months, since it is important to learn about your experiences with breastfeeding in the long run. Unless you would prefer not to be contacted for the follow-up part of the study, please sign and fill in your contact details in the space provided in box at the bottom of this page. **The consent form (along with your contact details) will be placed in a separate envelope by the research assistants.**

You have the right to withdraw your participation from the study whenever you want to. The information collected will be used exclusively for the purposes of this research and all the questionnaires will be discarded after the analysis of the data. Access to the questionnaires will be restricted to the members of the core research team.

Contact details

Tel			
Email			
Last name:	.....	First name:	.....
Signature:		Date:	

Appendix H: Baseline Questinnnaire



ΤΕΧΝΟΛΟΓΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΥΠΡΟΥ

ΣΧΟΛΗ ΕΠΙΣΤΗΜΩΝ ΥΓΕΙΑΣ

ΤΜΗΜΑ ΝΟΣΗΛΕΥΤΙΚΗΣ

**«Η αυτοπεποίθηση των μητέρων για το μητρικό θηλασμό και
οι απόψεις τους για την εφαρμογή των δέκα βημάτων στα
μαιευτήρια της Κύπρου»**

Εκ μέρους της ερευνητικής ομάδας

Σεπτέμβριος-Δεκέμβριος, 2014

[Κύπρος](#)

Ερωτήσεις σχετικά με τις εμπειρίες κατά τη διάρκεια της εγκυμοσύνης	
1.	Πόσες επισκέψεις κάνατε σε αυτό το νοσηλευτικό ίδρυμα για προγεννητική φροντίδα πριν γεννήσετε; επισκέψεις. (εάν δεν κάνατε επίσκεψη, προχωρήστε στην ερώτηση 4)
2.	Κατά τη διάρκεια των επισκέψεων αυτών, το προσωπικό σας μίλησε σε προσωπικό ή ομαδικό επίπεδο για το πώς πρέπει να σιτίζετε το βρέφος σας; ☐ ΝΑΙ ☐ ΟΧΙ
3.	Σας δόθηκαν πληροφορίες για τα ακόλουθα θέματα; (Εάν ναι, σημειώστε x) ☐ Τη σημασία που έχει να έρθετε σε επαφή δέρμα με δέρμα με το μωρό σας αμέσως μετά τη γέννηση του. ☐ Τη σημασία να είστε με το μωρό σας στο ίδιο δωμάτιο ή στο ίδιο κρεβάτι. ☐ Τους κινδύνους από τη χορήγηση νερού, τεχνητού γάλακτος ή άλλων διατροφικών συμπληρωμάτων, εάν θηλάζετε το μωρό σας τους πρώτους έξι μήνες ζωής.
Ερωτήσεις σχετικά με τη γέννηση και την περίοδο της μητρότητας	
4.	Πότε γεννήθηκε το μωρό σας; Ημερομηνία: Βάρος κατά τη γέννηση: kg
5.	Τι είδους τοκετό είχατε; ☐ Φυσιολογικό (κολπικό) ☐ Καισαρική τομή χωρίς γενική αναισθησία ☐ Καισαρική τομή με γενική αναισθησία ☐ Άλλο: Περιγράψτε:
6.	Πόση ώρα μετά τον τοκετό κρατήσατε το βρέφος για πρώτη φορά; ☐ Αμέσως ☐ Εντός 5 λεπτών ☐ Εντός μισής ώρας ☐ Εντός μίας ώρας ☐ Αμέσως μόλις ήμουν ικανή να ανταποκριθώ (μετά την ανάνηψη από καισαρική τομή με γενική αναισθησία) ☐ Άλλο (πόση ώρα μετά τη γέννηση) ☐ Δε θυμάμαι ☐ Δεν το κράτησα ακόμη (Αν δεν το κρατήσατε προχωρήστε στην ερώτηση 10)
7.	Πώς κρατήσατε το μωρό σας για πρώτη φορά; ☐ Δέρμα με δέρμα ☐ Τυλιγμένο χωρίς μεγάλη δερματική επαφή
8.	Εάν κάνατε περισσότερο από 5 λεπτά, για να κρατήσετε το μωρό σας, ποιος ήταν ο λόγος; ☐ Το μωρό μου χρειαζόταν ιατρική φροντίδα/ παρακολούθηση ☐ Είχα λάβει αναισθητικό

	☐ Δεν ήθελα να το κρατήσω ή δεν είχα τη δύναμη ☐ Δε μου δόθηκε το μωρό μου, αλλά δε γνωρίζω το λόγο ☐ Άλλο:
9.	Για πόσο περίπου χρονικό διάστημα κρατήσατε το μωρό σας την πρώτη φορά; ☐ Λιγότερο από 30 λεπτά ☐ Από 30 λεπτά έως λιγότερο από μία ώρα ☐ Μία ώρα ή περισσότερο ☐ Περισσότερο: Ώρες ☐ Δε θυμάμαι
10.	Δεχθήκατε οποιαδήποτε προσφορά βοήθειας γύρω από τον θηλασμό, κατά τη παραμονή σας στη μαιευτική κλινική; ☐ Ναι ☐ Όχι <i>[Εάν απαντήσατε ναι στην προηγούμενη ερώτηση]:</i> Πότε σας προσφέρθηκε αυτή η βοήθεια; <i>Σημειώστε όλες τις αληθείς απαντήσεις.</i> ☐ Την πρώτη φορά που κράτησα το μωρό μου μετά τη γέννηση ☐ Την επόμενη φορά που θήλασα το μωρό μου ή εντός 6 ωρών από τον τοκετό ☐ Περισσότερες από 6 ώρες μετά τον τοκετό
11.	Σας βοήθησε το προσωπικό σχετικά με την τοποθέτηση και την επαφή του βρέφους κατά τον θηλασμό πριν την έξοδο από την κλινική; ☐ Ναι ☐ Όχι ☐ Το προσωπικό προσέφερε βοήθεια, δεν είχα όμως ανάγκη
12.	Σας έδειξε το προσωπικό ή σας έδωσε πληροφορίες σχετικά με το πώς μπορείτε να αντλήσετε γάλα με το χέρι σας; ☐ Ναι ☐ Όχι Προσπαθήσατε να αντλήσετε εσείς η ίδια; ☐ Ναι ☐ Όχι Εάν ναι, τα καταφέρατε; ☐ Ναι ☐ Μερικώς ☐ Όχι
13.	Πού ήταν το μωρό σας, όταν εσείς ήσασταν στο μαιευτικό τμήμα μετά τη γέννηση; ☐ Το μωρό μου ήταν συνέχεια μαζί μου μέρα-νύχτα ☐ Το μωρό μου μερικές φορές δεν ήταν μαζί μου Εάν το μωρό δεν ήταν συνέχεια μαζί σας, περιγράψτε παρακαλώ πού ήταν, γιατί και για πόσο χρονικό διάστημα απουσίασε: <i>[Σημείωση: Αν το μωρό σας δέχτηκε φροντίδα μακριά σας για όλη ή μέρος της νύχτας, παρακαλώ συμπεριλάβετε το στην παραπάνω περιγραφή.]</i>
14.	Τι συμβουλές σας δόθηκαν σχετικά με το πόσο συχνά πρέπει να σιτίζετε το μωρό σας; ☐ Δεν μου δόθηκαν συμβουλές ☐ Κάθε φορά που το μωρό μου φαίνεται πεινασμένο (όσο συχνά θέλει) ☐ Κάθε ώρα ☐ Κάθε 1-2 ώρες ☐ Κάθε 2-3 ώρες

	☐ Άλλο (προσδιορίστε)
15.	Τι συμβουλές σας δόθηκαν σχετικά με το πόση ώρα πρέπει το μωρό σας να θηλάζει; ☐ Δεν μου δόθηκαν συμβουλές ☐ Όση ώρα επιθυμεί το μωρό μου ☐ Για ένα περιορισμένο χρονικό διάστημα και – εάν ναι - ποιο είναι αυτό; ☐ Άλλο (προσδιορίστε).....
16.	Έχει χορηγηθεί στο μωρό σας κάτι άλλο (εκτός από μητρικό γάλα) από τη στιγμή που γεννήθηκε; ☐ Ναι ☐ Όχι ☐ Δεν γνωρίζω <i>[Εάν όχι ή εάν δεν γνωρίζετε προχωρήστε στην ερώτηση 21]</i>
17.	Εάν ναι, τι δόθηκε; Σημειώστε όλες τις αληθείς απαντήσεις. ☐ Γάλα σε σκόνη ☐ Νερό ή νερό με γλυκόζη ☐ Άλλα υγρά (προσδιορίστε) ☐ Δεν γνωρίζω
18.	Για ποιο λόγο το βρέφος σας έλαβε αυτά τα διατροφικά συμπληρώματα; ☐ Δεν θηλάζε ☐ Δεν ησύχαζε ☐ Είχε σοβαρή/οξεία απώλεια νερού ☐ Εγώ το ζήτησα ☐ Δεν γνωρίζω ☐ Άλλο (προσδιορίστε)
19.	Ενημερωθήκατε σχετικά με το συμπλήρωμα που χορηγήθηκε; ☐ Ναι ☐ Όχι
20.	Εάν δόθηκε κάποιο συμπλήρωμα, αυτό δόθηκε με : ☐ Μπουκάλι (μπιμπερό) ☐ Κούπα ☐ Κουτάλι ☐ Δεν γνωρίζω ☐ Άλλο
21.	Χορήγησε το προσωπικό στο μωρό σας πιπίλα; ☐ Ναι ☐ Όχι ☐ Δεν γνωρίζω
22.	Επιλέξατε εσείς να χορηγήσετε η ίδια στο μωρό σας πιπίλα; ☐ Ναι ☐ Όχι <i>[Εάν όχι, προχωρήστε στην επόμενη ερώτηση]</i> <i>[Εάν ναι]</i> σας ενημέρωσε καθόλου το προσωπικό σχετικά με τη χρήση των πιπίλων και πώς αυτά μπορεί να επηρεάσουν την υγεία του βρέφους σας; ☐ Ναι ☐ Όχι
23.	Σας δόθηκαν κάποια φυλλάδια ή τρόφιμα που προωθούν τα υποκατάστατα του μητρικού γάλακτος; ☐ Ναι ☐ Όχι Εάν ναι, τι από τα παρακάτω δεχθήκατε;

	☐ Ένα φυλλάδιο από κάποια εταιρεία διάθεσης τεχνητού γάλακτος το οποίο προωθεί τη σίτιση με τεχνητό γάλα ή άλλες σχετιζόμενες τροφές. ☐ Ένα δωρεάν δείγμα για το σπίτι όπως τεχνητό γάλα, μπουκάλι ή άλλα σχετιζόμενα τρόφιμα. ☐ Άλλο (προσδιορίστε).....
24.	Σας έγιναν κάποιες υποδείξεις σχετικά με το πώς ή πού να αναζητήσετε βοήθεια, εάν έχετε προβλήματα σχετικά με τη σίτιση του βρέφους σας, αφότου γυρίσετε στο σπίτι; ☐ Ναι ☐ Όχι (Αν Ναι, τι υποδείξεις σας έγιναν;) ☐ Καλέστε το νοσοκομείο ή χρησιμοποιήστε κάποια γραμμή βοήθειας ☐ Ζητήστε μια επίσκεψη στο σπίτι ☐ Επικοινωνήστε με κάποιον σύμβουλο γαλουχίας ή εθελοντή ☐ Πηγαίνετε σε εξωτερικό ιατρείο, όπου προσφέρεται βοήθεια. ☐ Καλέστε μία ομάδα υποστήριξης της μητέρας ☐ Χρησιμοποιήστε κάποιες άλλες υπηρεσίες υγείας της κοινότητας ☐ Άλλο (προσδιορίστε).....

Ερωτήσεις σχετικά με την αυτοπεποίθηση για το θηλασμό

Για κάθε μια από τις πιο κάτω προτάσεις, παρακαλώ να επιλέξετε την απάντηση που εκφράζει καλύτερα πόση σιγουριά - αυτοπεποίθηση νιώθετε όταν θηλάζετε το μωρό σας. *Είναι σημαντικό να προσπαθήσετε να απαντήσετε όλες τις ερωτήσεις σε αυτή την ενότητα, αφού με βάση τις απαντήσεις που θα δώσετε και στις 14 ερωτήσεις μπορεί να υπολογιστεί ένα συνολικό σκορ.*

Κυκλώστε τον αριθμό που εκφράζει περισσότερο το πώς αισθάνεστε, ότ...

1= δεν αισθάνομαι καμιά σιγουριά

2= δεν αισθάνομαι και πολλή σιγουριά

3= μερικές φορές αισθάνομαι σιγουριά

4= αισθάνομαι σιγουριά

5= αισθάνομαι μεγάλη σιγουριά

καμιά σιγουριά

μεγάλη σιγουριά

25.	Μπορώ πάντα να αξιολογώ ότι το μωρό μου παίρνει αρκετό γάλα	1	2	3	4	5
26.	Μπορώ πάντα να ανταπεξέρχομαι επιτυχημένα στο θηλασμό, όπως το έχω κάνει και με άλλες προκλήσεις	1	2	3	4	5
27.	Μπορώ πάντα να θηλάζω το μωρό μου χωρίς να χρησιμοποιώ ξένο γάλα	1	2	3	4	5
28.	Μπορώ πάντα να διασφαλίζω ότι το μωρό θηλάζει σωστά σε όλη την διάρκεια του θηλασμού	1	2	3	4	5
29.	Μπορώ πάντα να τα καταφέρνω με την διαδικασία του θηλασμού ώστε να είμαι ικανοποιημένη	1	2	3	4	5
30.	Μπορώ πάντα να καταφέρνω να θηλάζω ακόμη και όταν το μωρό μου κλαίει	1	2	3	4	5
31.	Μπορώ πάντα να διατηρώ τη θέληση μου να θηλάζω	1	2	3	4	5

32.	Μπορώ πάντα να θηλάζω άνετα όταν τα μέλη της οικογένειάς μου είναι παρόντα	1	2	3	4	5
33.	Μπορώ πάντα να είμαι ικανοποιημένη με την εμπειρία του θηλασμού	1	2	3	4	5
34.	Μπορώ πάντα να διαχειρίζομαι το γεγονός ότι ο θηλασμός είναι χρονοβόρος	1	2	3	4	5
35.	Μπορώ πάντα να ολοκληρώνω το θηλασμό με το ένα στήθος πριν αλλάξω στο άλλο	1	2	3	4	5
36.	Μπορώ πάντα να συνεχίζω να θηλάζω σε κάθε γεύμα.	1	2	3	4	5
37.	Μπορώ πάντα να ανταπεξέρχομαι στις ανάγκες του μωρού μου για θηλασμό	1	2	3	4	5
38.	Μπορώ πάντα να καταλαβαίνω πότε το μωρό μου έχει σταματήσει να θηλάζει	1	2	3	4	5
Δημογραφικά Χαρακτηριστικά <i>Παρακαλώ συμπληρώστε ή σημειώστε x ή √ σε ότι ισχύει από τα πιο κάτω:</i>						

39. Ηλικία: 18-24 ☐ 25-29 ☐ 30-34 ☐ 35-39 ☐ ≥ 40 ετών ☐
ετών ετών ετών ετών

40. Μόρφωση: Δημοτ ☐ Γυμνάσιο/ ☐ Πτυχίο ☐ Μεταπτυχιακό ☐
ικό Λύκειο Πανεπιστημίου τίτλο σπουδών
/ Κολλεγίου

41. Οικογενειακή κατάσταση ☐ Παντρεμένη/ Σε Συμβίωση ☐ Ελεύθερη ☐ Διαζευγμένη ☐
/Σε διάσταση

42. Επαγγελματική απασχόληση ☐ Εργαζόμενη – ☐ Μερική ☐ Άνεργη ☐
Πλήρης απασχόληση απασχόληση

43. Καθαρό οικογενει ☐ ≤ €1500 ☐ €1501- ☐ €3001- €4500 ☐ > €4501 ☐
ό €3000
εισόδημα
ήνα

44. Χώρα καταγωγής: 45. Τόπος
διαμονής.....

Χρήση ουσιών. Σημειώστε x ή √ εάν ισχύει				
	Κάπνισμα (έστω και 1 τσιγάρο/μέρα)	Οινοπνευματώδη (έστω και 1 ποτήρι/εβδομάδα)	Ναρκοτικ ά	Ψυχότροπα φάρμακα
46. Πριν την εγκυμοσύνη	☐	☐	☐	☐
47. Κατά την εγκυμοσύνη	☐	☐	☐	☐

Πληροφορίες για άλλα παιδιά (κυκλώστε ή συμπληρώστε αναλόγως)

Αν είναι το πρώτο σας μωρό προχωρήστε στην ερώτηση 51

48. Αριθμός παιδιών στην οικογένεια (συμπεριλαμβανομένου του νεογέννητου) παιδιά
49. Έχετε θηλάσει άλλο μωρό προηγουμένως; Ναι Όχι
50. Έχετε θηλάσει αποκλειστικά για έξι μήνες άλλο σας μωρό (δίνοντας μόνο το δικό σας γάλα, χωρίς άλλα υγρά); Ναι Όχι

Πληροφορίες για το θηλασμό του νεογέννητου μωρού σας (κυκλώστε ή συμπληρώστε αναλόγως)		
51. Θηλάσατε το νεογέννητο μωρό σας κατά την πρώτη ώρα γέννησης;	Ναι	Όχι
52. Θηλάσατε το νεογέννητο μωρό σας κατά τις πρώτες 48 ώρες;	Ναι	Όχι
53. Θέλετε να θηλάσετε αποκλειστικά;	Ναι	Όχι
54. Αν Ναι θα θέλατε να κρατήσει ο αποκλειστικός θηλασμός για τους πρώτους 6 μήνες;	Ναι	Όχι
55. Μέχρι πότε σκοπεύετε να θηλάσετε;	 μήνες	

Ευχαριστούμε πολύ για τη συμμετοχή σας!



Cyprus University Technology

School of Health Sciences

Department of Nursing

**«Assessment of mothers’ breastfeeding self-efficacy (confidence)
and their views on the implementation of the “*ten steps*” for
successful breastfeeding in maternity units in the Republic of
Cyprus»**

September-November 2014

Cyprus

Questions about experiences during pregnancy	
1.	How many antenatal visits did you make to this health facility for care before you gave birth? visits (if none, go to question 4.)
2.	During these visits did the staff discuss at individual or group level about your baby's feeding? ☐ Yes ☐ No
3.	During these visits did the staff give you any information on the following topics: (tick if yes.) ☐ The importance of spending time skin-to-skin with your baby immediately after birth? ☐ The importance of having your baby with you in your room or bed 24 hours a day? ☐ The risks of giving water, formula or other supplements to your baby in the first six months if you are breastfeeding?
Questions about the birth and the maternity period	
4.	When was your child born? Date: What was your baby's weight at birth: kg
5.	What type of delivery did you have: ☐ Normal (vaginal) ☐ Caesarean section without general anaesthesia ☐ Caesarean section with general anaesthesia ☐ Other: (describe):
6.	How long after birth did you first hold your baby? ☐ Immediately ☐ Within five minutes ☐ Within half an hour ☐ Within an hour ☐ As soon as I was able to respond (after C-section with general anaesthesia) ☐ Other: (how long after birth?) ☐ Can't remember ☐ Have not held yet [if you haven't held your baby yet, go to Q10.]
7.	How did you hold your baby, this first time? ☐ Skin-to-skin ☐ Wrapped without much skin contact
8.	If it took more than five minutes after birth for you to hold your baby, what was the reason? ☐ My baby needed help/observation ☐ I had been given anaesthesia and wasn't yet awake

	☐ I didn't want to hold my baby or didn't have the energy ☐ I wasn't given my baby this soon but do not know why ☐ Other:
9.	For about how long did you hold your baby this first time? ☐ Less than 30 minutes ☐ 30 minutes to less than an hour ☐ An hour or more ☐ Longer: hours ☐ Can't remember
10.	Did the staff offer you any help with breastfeeding since that first time? ☐ Yes ☐ No <i>[if yes:]</i> How long after birth was this help offered? ☐ When your baby was born ☐ Within 6 hours of when your baby was born ☐ More than 6 hours after the birth of your baby
11.	Did the staff give you any help with positioning and attaching your baby for breastfeeding before discharge? ☐ Yes ☐ No ☐ The staff offered help, but I didn't need it.
12.	Did the staff show you or give you information on how you could express your milk by hand? ☐ Yes ☐ No Have you tried expressing your milk yourself? ☐ Yes ☐ No If yes, were you able to express your milk? ☐ Yes ☐ Partly ☐ No
13.	Where was your baby while you were in the maternity services after giving birth? ☐ My baby was always with me both day and night ☐ There were times my baby was not with me If your baby was away at all, please describe where, why and for how long:..... <i>[Note: If your baby was cared for away from you during all or part of the night, please mention that in your description above]</i>
14.	What advice have you been given about how often to feed your baby? ☐ No advice given ☐ Every time my baby seems hungry (as often as he/she wants)

Appendices

	☐ Every hour ☐ Every 1-2 hours ☐ Every 2-3 hours ☐ Other (please tell us):
15.	What advice have you been given about how long your baby should suckle? ☐ No advice given ☐ For a limited time If so, for how long?..... ☐ For as long as my baby wants to ☐ Other (please tell us):
16.	Has your baby been given anything other than breast milk since it was born? ☐ Yes ☐ No ☐ Don't know [if "No" or "Don't know", go to Question 21]
17.	If yes, what was given? [tick all that apply] ☐ Infant formula ☐ Water or sugar water ☐ Other fluids (please tell us what): ☐ Don't know
18.	If yes, why was your baby given the supplement(s)? [tick all that apply] ☐ Not suckling ☐ Unsettled ☐ Baby had severe/acute water loss ☐ I requested it ☐ Don't know ☐ Other (please tell us why):
19.	Did the staff inform you about the supplement given to your baby? ☐ Yes ☐ No
20.	If supplement(s) were given, were they fed by: ☐ Bottle with teat or nipple? ☐ Cup? ☐ Spoon? ☐ Other: ☐ Don't know
21.	Has your baby sucked on a pacifier (dummy or soother), as far as you know, while you've been in the maternity unit? ☐ Yes ☐ No ☐ Don't know
22.	Did you choose to administer to your baby a pacifier (dummy or soother)? ☐ Yes ☐ No (if yes) Did the staff inform you about the use of pacifier and how can this affect the health of your baby? ☐ Yes ☐ No
23.	Have you been given any leaflets or supplies that promote breast-milk substitutes?

Appendices

	☐ Yes ☐ No What, if any, of the following have you received: ☐ Leaflet from formula company promoting formula feeding or related supplies? ☐ A gift or samples to take home, including formula, bottles, or other related supplies? ☐ Other (please tell us what):
24.	Have you been given any suggestions by the staff about how or where to get help, if you have problems with feeding your baby after you return home? ☐ Yes ☐ No <i>[If “Yes”:] What suggestions have you been given? [tick all that apply]</i> ☐ Get help from the hospital ☐ Get help from a health professional ☐ Call a helpline ☐ Get help from a mother support group or a peer/lay counsellor ☐ Get help from another community service ☐ Other (please tell us what):
Questions about breastfeeding self-efficacy/confidence	

For each of the following suggestions, please choose the response that best expresses how **confident** you feel when you are breastfeeding your baby. *It is important to try to answer ALL questions in this section since a total score based on all 14 items can be calculated.*

For each, circle the number that expresses more **how you feel...**

1=Not at all Confident 2= Not Confident 3=Somewhat Confident 4= Confident 5= Very Confident		Not at all			Very Confident	
25.	Determine that my baby is getting enough milk	1	2	3	4	5
26.	Successfully cope with breastfeeding like I have with other challenging tasks	1	2	3	4	5

Appendices

27.	Breastfeed my baby without using formula as a supplement	1	2	3	4	5
28.	Ensure that my baby is properly latched on for the whole feeding	1	2	3	4	5
29.	Manage the breastfeeding situation to my satisfaction	1	2	3	4	5
30.	Manage to breastfeed even if my baby is crying	1	2	3	4	5
31.	Keep wanting to breastfeed	1	2	3	4	5
32.	Comfortably breastfeed with my family members present	1	2	3	4	5
33.	Be satisfied with my breastfeeding experience	1	2	3	4	5
34.	Deal with the fact that breastfeeding can be time- consuming	1	2	3	4	5
35.	Finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5
36.	Continue to breastfeed my baby for every feeding	1	2	3	4	5
37.	Manage to keep up with my baby's breastfeeding demands	1	2	3	4	5
38.	Tell when my baby is finished breastfeeding	1	2	3	4	5

Demographic characteristics

Please complete or mark x or √ accordingly:

39. Age: 18-24 years ☐ 25-29 years ☐ 30-34 years ☐ 35-39 years ☐ ≥ 40 years ☐

40. Education: Primary school ☐ High School ☐ College/University degree ☐ Postgraduate ☐

41. Marital status: Married ☐ Single ☐ Divorced ☐
/Cohabiting /Separated

42. Occupational status: Full-time employment ☐ Part-time employment ☐ Unemployed ☐

Appendices

43. Monthly net family income ≤ €1500 ☐ €1501-€3000 ☐ €3001-€4500 ☐ > €4501 ☐

44. Country of origin: 45. Place of residence.....

Substance use. *Mark x or √ only if true*

	Smoking (even if only 1 cig/day)	Alcohol (even if only 1 glass/week)	Drugs	Psychotropic medicine
46. Before pregnancy	☐	☐	☐	☐
47. During pregnancy	☐	☐	☐	☐

Information about your other children *(circle or fill in as appropriate)*

If this is your first baby, please go to Question 51.

48. Number of children in your family (including your newborn child) children
49. Have you breastfed another baby previously? Yes No
50. Have you ever exclusively breastfed for six months any of your other children (giving it only your own breast milk, but no other liquids)? Yes No

Information regarding breastfeeding your newborn baby *(circle or fill in as appropriate)*

51. Have you breastfed your newborn baby within the first hour of birth? Yes No
52. Have you breastfed your newborn baby in the first 48 hours from birth? Yes No
53. Do you want to breastfeed exclusively? Yes No
54. If Yes, would you like to breastfeed exclusively for the first 6 months? Yes No
55. How long do you intend to breastfeed for? months

Thank you for your participation!

Appendix I: 1st Month's Questionnaire

ΜΕΛΕΤΗ ΓΙΑ ΤΟΝ ΜΗΤΡΙΚΟ ΘΗΛΑΣΜΟ ΣΤΗΝ ΚΥΠΡΟ

ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ 1ου ΜΗΝΑ

Εκ μέρους της ερευνητικής ομάδας για τις πρακτικές των Κυπριακών μαιευτηρίων και το μητρικό θηλασμό, θα ήθελα να σας ευχαριστήσω για ακόμα μια φορά που αποδεχθήκατε την πρόσκληση μας να λάβετε μέρος στην έρευνά μας. Η μελέτη έχει προχωρήσει με μεγάλη επιτυχία στη δεύτερη φάση της, όπου επικοινωνούμε τηλεφωνικά ή μέσω ηλεκτρονικού ταχυδρομείου με όλες τις μαμάδες 4-6 εβδομάδες μετά από τη γέννηση.

Θα θέλαμε να μας απαντήσετε σε κάποιες ερωτήσεις σε σχέση με την μέχρι τώρα εμπειρία σας , π.χ. πως τρέφεται το μωρό σας, εάν θηλάσατε ή θηλάζετε και κάποιες γενικές ερωτήσεις σε σχέση με αυτή την εμπειρία. Η συμμετοχή σας και σε αυτό το στάδιο της μελέτης είναι ιδιαίτερα σημαντική και θα βοηθήσει τα μέγιστα όλες τις μελλοντικές μαμάδες στην Κύπρο.

Σας διαβεβαιώνω ότι όλα τα προσωπικά σας στοιχεία και απαντήσεις φυλάγονται ανώνυμα με χρήση κωδικών και μόνο η ερευνητική ομάδα έχει πρόσβαση σ' αυτά. Σε καμία δημοσίευση των ευρημάτων της έρευνας δεν θα φαίνεται κάποιο προσωπικό σας δεδομένο.

Οδηγίες: Παρακαλώ διαβάστε προσεκτικά τις ερωτήσεις. Όταν επιλέξετε το κουτάκι που αντιστοιχεί στην απάντησή σας, πατήστε δυο φορές (double click) την αριστερή μεριά του ποντικιού (mouse). Θα ανοίξει ένα παράθυρο (window) και θα πρέπει να επιλέξετε ‘checked’ κάτω από το ‘default value’. Πατήστε OK. Θα εμφανιστεί ένα x μέσα στο κουτάκι. Αν κάνετε λάθος, επαναλάβετε την διαδικασία και επιλέξτε ‘not checked’.

Όταν απαντήσετε όλες τις ερωτήσεις, είναι σημαντικό να αποθηκεύσετε (save as) το ερωτηματολόγιο αλλιώς δεν θα παραμείνουν οι επιλογές σας. Παρακαλώ να επιστραφεί στη διεύθυνση: ireneassioti24@gmail.com.

ΕΡΩΤΗΣΕΙΣ ΣΕ ΣΧΕΣΗ ΜΕ ΤΟ ΜΗΤΡΙΚΟ ΘΗΛΑΣΜΟ				
1. Τώρα που φτάσατε στον πρώτο μήνα, πως ταΐζετε το μωρό σας;				
Μόνο μητρικό γάλα	1	☐		
Κυρίως μητρικό γάλα αλλά και φόρμουλα	2	☐		
Κυρίως φόρμουλα αλλά και μητρικό γάλα	3	☐		
Μόνο φόρμουλα	4	☐		
Άλλο (παρακαλώ προσδιορίστε)	5	☐		
[Αν απαντήσατε «μόνο φόρμουλα» δεν χρειάζεται να απαντήσετε τις 14 ερωτήσεις σε σχέση με την αυτοπεποίθηση που βρίσκονται στην σελίδα 5. Αν η απάντηση ήταν «μόνο μητρικό γάλα» ή συνδυασμός, προχωράτε κανονικά και απαντάτε όλο το ερωτηματολόγιο]				
2. Τις τελευταίες 24 ώρες, το μωρό σας έχει πάρει:				
Χαμομήλι, τσάι ή άλλο ρόφημα;	1	☐	NAI	2 ☐ OXI ☐ ΔΕΝ ΓΝΩΡΙΖΩ
Χυμό φρούτου;	1	☐	NAI	2 ☐ OXI ☐ ΔΕΝ ΓΝΩΡΙΖΩ
Νερό ή ζαχαρόνερο;	1	☐	NAI	2 ☐ OXI ☐ ΔΕΝ ΓΝΩΡΙΖΩ
3. Μέχρι σήμερα, το μωρό σας έχει πάρει:				
Χαμομήλι, τσάι ή άλλο ρόφημα;	1	☐	NAI	2 ☐ OXI ☐ ΔΕΝ ΓΝΩΡΙΖΩ
Χυμό φρούτου;	1	☐	NAI	2 ☐ OXI ☐ ΔΕΝ ΓΝΩΡΙΖΩ
Νερό ή ζαχαρόνερο;	1	☐	NAI	2 ☐ OXI ☐ ΔΕΝ ΓΝΩΡΙΖΩ

4. Πόσων εβδομάδων ήταν το μωρό σας όταν του δόθηκε για πρώτη φορά (πέραν του μητρικού γάλατος) κάποιο άλλο υγρό, όπως φόρμουλα, νερό, χυμός, τσάι; Πέραν από το μητρικό γάλα, δεν δόθηκε άλλο υγρό 1 ☐ Από την 1 εβδομάδα 2 ☐ Στην 2-3 εβδομάδα 3 ☐ Από την τελευταία εβδομάδα 4 ☐	
5. Μπορείτε να μου πείτε πόσο συχνά (δηλαδή, πόσες φορές την ημέρα ή πόσες φορές την εβδομάδα) παίρνει το μωρό σας.....; <i>Εάν μια τροφή δεν λαμβάνεται καθημερινά, παρακαλώ όπως γράψετε τη συχνότητα κατανάλωσης στη στήλη κάτω από το φορές/εβδομάδα</i> <i>Οδηγίες για να απαντήσετε την ερώτηση: Πατήστε δύο φορές (double click) την αριστερή μεριά του ποντικιού (mouse). Θα ανοίξει ένα παράθυρο (window). Γράψτε την απάντησή σας (αριθμό) στο 'default text' και πατήστε OK. Αν θέλετε να διαγράψετε ή να αλλάξετε την απάντηση, επαναλάβετε τη διαδικασία και αλλάξετε την απάντηση σας ανάλογα.</i>	
Φορές/ημέρα	Φορές/εβδομάδα
Μητρικό Γάλα	
Γάλα σκόνη (Φόρμουλα)	
Χαμομήλι, τσάι ή άλλο ρόφημα	
Χυμό Φρούτου	
Νερό ή ζαχαρόνερο	
Κάποιο συμπλήρωμα όπως σίδηρο, βιταμίνη D, άλλες βιταμίνες κτλ [Σημειώστε τη συχνότητα ή τουλάχιστον απλά με X όσα από τα πιο κάτω συμπληρώματα παίρνει το μωρό] Σίδηρος ☐ Βιταμίνη D ☐ Άλλες Βιταμίνες ☐	

Άλλο Συμπλήρωμα. Προσδιορίστε	
Κάτι άλλο που δεν ανέφερθηκε;	
Προσδιορίστε	
ΕΠΙΛΕΓΜΕΝΕΣ ΕΡΩΤΗΣΕΙΣ ΑΠΟ ΤΟ ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΤΩΝ «10 ΒΗΜΑΤΩΝ»	
6. Τι συμβουλές σας δόθηκαν σχετικά με το πόσο συχνά πρέπει να σιτίζετε το μωρό σας; [EP. 14]	
Δεν μου δόθηκαν συμβουλές	1 ☐
Κάθε φορά που το μωρό μου φαίνεται πεινασμένο (όσο συχνά θέλει)	2 ☐
Κάθε ώρα	3 ☐
Κάθε 1-2 ώρες	4 ☐
Κάθε 2-3 ώρες	5 ☐
Άλλο (προσδιορίστε)	6 ☐
7. Τι συμβουλές σας δόθηκαν σχετικά με το πόση ώρα πρέπει το μωρό σας να θηλάζει; [EP. 15]	
Δεν μου δόθηκαν συμβουλές	1 ☐
Όση ώρα επιθυμεί το μωρό μου	2 ☐
Για ένα συγκεκριμένο χρονικό διάστημα. Εάν ναι - ποιο είναι αυτό;	3 ☐
Άλλο (προσδιορίστε)	4 ☐
Ερωτήσεις σχετικά με την αυτοπεποίθηση για το θηλασμό	
[Να απαντηθεί μόνο αν θηλάζετε (έστω και αν δίνεται παράλληλα φόρμουλα)].	
Οδηγίες – Ακολουθεί μια σειρά από 14 προτάσεις σε σχέση με την σιγουριά - αυτοπεποίθηση που νιώθετε όταν θηλάζετε το μωρό σας. Είναι ουσιαστικά το ίδιο ερωτηματολόγιο που απαντήσατε στην κλινική αλλά είναι σημαντικό να το απαντήσετε ξανά, αφού τώρα που έχετε προσωπική εμπειρία με το θηλασμό. Για την κάθε μια πρόταση, θα πρέπει να σημειώσετε την απάντησή σας σε μια κλίμακα από 1 μέχρι 5 σε σχέση με την σιγουριά - αυτοπεποίθηση που αισθάνεστε για το καθένα. Για παράδειγμα, αν απαντήσετε 1 αυτό θα πει ότι «δεν αισθάνεστε καμιά σιγουριά/αυτοπεποίθηση» ενώ κλιμακωτά οι απαντήσεις 2, 3 και 4 θα αντιπροσωπεύουν όλο και μεγαλύτερη σιγουριά με το 5 στην κλίμακα να αντιπροσωπεύει την απάντηση ότι για το	

συγκεκριμένο θέμα « αισθάνεστε μεγάλη σιγουριά ». Δεν υπάρχει σωστό ή λάθος, αφού θα δηλώσετε την απάντηση που εκφράζει καλύτερα το πώς εσείς αισθάνεστε.						
8.	Μπορώ πάντα να αξιολογώ ότι το μωρό μου παίρνει αρκετό γάλα	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
9.	Μπορώ πάντα να ανταπεξέρχομαι επιτυχημένα στο θηλασμό, όπως το έχω κάνει και με άλλες προκλήσεις	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
10.	Μπορώ πάντα να θηλάζω το μωρό μου χωρίς να χρησιμοποιώ ξένο γάλα	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
11.	Μπορώ πάντα να διασφαλίζω ότι το μωρό θηλάζει σωστά σε όλη την διάρκεια του θηλασμού	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
12.	Μπορώ πάντα να τα καταφέρνω με την διαδικασία του θηλασμού ώστε να είμαι ικανοποιημένη	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
13.	Μπορώ πάντα να καταφέρνω να θηλάζω ακόμη και όταν το μωρό μου κλαίει	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
14.	Μπορώ πάντα να διατηρώ τη θέληση μου να θηλάζω	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
15.	Μπορώ πάντα να θηλάζω άνετα όταν τα μέλη της οικογένειας μου είναι παρόντα	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
16.	Μπορώ πάντα να είμαι ικανοποιημένη με την εμπειρία του θηλασμού	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
17.	Μπορώ πάντα να διαχειρίζομαι το γεγονός ότι ο θηλασμός είναι χρονοβόρος	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
18.	Μπορώ πάντα να ολοκληρώνω το θηλασμό με το ένα στήθος πριν αλλάξω στο άλλο	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
19.	Μπορώ πάντα να συνεχίζω να θηλάζω σε κάθε γεύμα.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

20.	Μπορώ πάντα να ανταπεξέρχομαι στις ανάγκες του μωρού μου για θηλασμό	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
21.	Μπορώ πάντα να καταλαβαίνω πότε το μωρό μου έχει σταματήσει να θηλάζει	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
ΕΡΩΤΗΣΕΙΣ ΣΧΕΤΙΚΑ ΜΕ ΤΗΝ ΠΡΟΘΕΣΗ ΣΑΣ ΝΑ ΘΗΛΑΣΕΤΕ						
21. Πότε αποφασίσατε για τον τρόπο που θα ταΐζετε το παιδί σας;						
Πριν την εγκυμοσύνη 1 ☐ Κατά τη διάρκεια της εγκυμοσύνης 2 ☐ Μετά τη γέννηση του παιδιού 3 ☐						
22. Θα θέλαμε να μας πείτε ποιός ή τι σας βοήθησε να πάρετε την απόφαση για τον τρόπο που θα ταΐσετε το παιδί σας;						
Κανένας/ αποκλειστικά δική σας η απόφαση ☐ 1 Η μαία ☐ 7 Ο σύντροφός σας ☐ 2 Ο γυναικολόγος σας ☐ 8 Η μητέρα σας ☐ 3 Ο παιδίατρος σας ☐ 9 Η πεθερά σας ☐ 4 Η προηγούμενη εμπειρία σας ☐ 10 Άλλοι συγγενείς ☐ 5 Βιβλία/ περιοδικά/ internet ☐ 11 Φίλοι/ συνάδελφοι ☐ 6 Προγεννητικό Μάθημα/ Διάλεξη ☐ 12						
23. Εάν θηλάζετε ή έχετε θηλάσει, πότε αποφασίσατε για τη διάρκεια που θα θέλετε να θηλάσετε το παιδί σας;						
Πριν την εγκυμοσύνη 1 ☐ Κατά τη διάρκεια της εγκυμοσύνης 2 ☐ Μετά τη γέννηση του παιδιού 3 ☐ Δεν γνωρίζω 4 ☐						
ΕΡΩΤΗΣΗ ΓΙΑ ΤΗΝ ΠΑΡΟΥΣΑ ΚΑΤΑΣΤΑΣΗ ΕΡΓΟΔΟΤΗΣΗΣ ΣΑΣ						
23. Ποια είναι η παρούσα κατάσταση εργοδότησής σας;						

Άδεια μητρότητας	1 ☐	Αυτοεργοδοτούμενη	4 ☐
Εργαζόμενη – Πλήρης Απασχόληση	2 ☐	Άδεια άνευ απολαβών	5 ☐
Μερική Απασχόληση	3 ☐	Άνεργη	6 ☐
		Άλλο, παρακαλώ διευκρινίστε	7

Παρακαλώ ελέγξτε ότι έχετε απαντήσει όλες τις ερωτήσεις. Αν δεν θηλάζετε, δεν χρειάζεται να απαντήσετε τις ερωτήσεις σχετικά με την αυτοπεποίθηση για το θηλασμό, σελίδα 5-6.

Όταν απαντήσετε όλες τις ερωτήσεις, είναι σημαντικό να αποθηκεύσετε (save as) το ερωτηματολόγιο αλλιώς δεν θα παραμείνουν οι επιλογές σας. Παρακαλώ να επιστραφεί στη διεύθυνση: ireneassioti24@gmail.com.

Ευχαριστούμε πάρα πολύ για το χρόνο σας.

Η συμβολή σας έχει τεράστια σημασία!

Καλή συνέχεια και τις καλύτερες μας ευχές για το νεογέννητο και την οικογένεια σας.

Date :

Code _____

BREASTFEEDING PRACTICES STUDY IN CYPRUS

QUESTIONNAIRE OF 1ST MONTH

«Good morning/ Good afternoon. My name is..... I am contacting you on behalf of the research team that is investigating the implementation of breastfeeding practices in maternal clinics in Cyprus. It is the study that you participated during your staying in the hospital/ clinic when you gave birth. Firstly, I would like to congratulate on the arrival of your baby ‘

We would like ask you if you can spare us some of your time to answer a few questions in relation to your experience on your infant’s feeding practices so far. Your participation in the study is extremely important as it will help us to collect information that will enable us to support future mothers in Cyprus. This the first study ever conducted in Cyprus which aims to investigate the experiences and attitudes of Cypriot mothers regarding breastfeeding.

This won’t take much of your time. It will take only 10-15 minutes. If it is inconvenient we can arrange another time that will be more suitable for you. [ANSWER] If you have negative response, ARRANGE ANOTHER APPOINTMENT]

We will start off with a few questions regarding with the way you feed your baby. For every question I will give a number of choices for you to answer. You will choose which one is more suitable in your case.

If a respondent asks about the confidentiality of data: ‘I assure you that confidentiality of your answers and personal information is safeguarded and only the research group will have access. No personal information will appear in any document published.’

QUESTIONS ON BREASTFEEDING PRACTICES

1. Now that you have reached your first month, how are you feeding your baby? *[Read all the answers]*

Breast feeding only	1
Mainly breast feeding but also bottle-feeding (formula)	2
Mainly bottle-feeding (formula) but also breast feeding	3
Only bottle-feeding (formula)	4
Other (please specify)_____	5

[If the answer given is “Only bottle-feeding (formula)” we will not proceed to the section regarding breastfeeding self-efficacy. For all other answers, we will include the section with 14 questions regarding breastfeeding self-efficacy]

2. During the last 24 hours, your baby was fed with: *[Read each option at a time and circle the answer]:*

Chamomile , tea, or other liquid	1	YES	2	NO	3	DON’ T KNOW
Fruit Juice	1	YES	2	NO	3	DON’T KNOW
Water or water with sugar	1	YES	2	NO	3	DON’T KNOW

3. During the last month, your baby was fed with *[Read each option at a time and circle the answer]:*

Chamomile , tea, or other liquid	1	YES	2	NO	3	DON’ T KNOW
Fruit Juice	1	YES	2	NO	3	DON’T KNOW
Water or water with sugar	1	YES	2	NO	3	DON’T KNOW

4. (In weeks) How old was your baby when was first given other liquids (expect breast milk) such as water, juice, tea? *[Read only the question and select the nearest option to the answer given]*

Expect breast milk, no other liquids have been added/ given	1
From the 1 st week	2
During the 2-3 weeks	3
The last week	4

5. How often has your baby been fed with (how many times per day or how many times per week).....?

[Read one answer at a time and fill in the frequency for each food. If the baby is fed the food less than once a day, write the number of feedings on the second column (feedings/ week)].

Feedings/ day Feedings/ Week

Breast Milk

Formula

Chamomile, tea or other liquid

Fruit Juice

Water or water with sugar

Medication (any form)

Please Specify_____

Any Supplement like iron, vitamin D, other vitamins ect *[Depending on the answer, write down the frequency or at least the ones that were mentioned]*

Iron

Vitamin D

Other Vitamins

Other supplement. Specify_____

Something else not mentioned?

Specify_____

SELECTED QUESTIONS FROM THE QUESTIONNAIRE “10 STEPS TO A SUCCESSFULL BREASTFEEDING”

6. What advice has been given to you on how often you should feed your baby? [Q. 14]

[Read only the question and select the nearest option to the answer given. If they finding it difficult to answer or their answer is not clear [1], then read the answers [2-5]

No advice has been given to me	1
Every time that my baby seems to be hungry (on demand)	2
Every hour	3
Every 1-2 hours	4
Every 2-3 hours	5
Other (Specify)	6

7. What advice has been given to you about the amount of time that your baby should breastfeed? [Q. 15]

[Read only the question and select the nearest option to the answer given. If they finding it difficult to answer or their answer is not clear [1], then read the answers 2-3, and wait for the answer. If the answer is not [2], then write down the answer]

No advice has been given to me	1
As long as my baby wants	2
For a specific time. If yes, how long;	3
Other (Specify).....	4

QUESTIONS ON THE BREASTFEEDING SELF-EFFICACY

[Only those who breastfeed should answer, even if they administer formula simultaneously.]

I will read to you 14 sentences regarding the level of certainty-confidence you feel during breastfeeding your baby. Basically it's the same questionnaire you completed the time you were in the clinic but it's important that you fill it in again now, that you are more experienced with breastfeeding. For every sentence I read you, I want you to answer me from a scale from 1 to 5 concerning the level of certainty-confidence you feel fits the most. For example if you answer is 1, it means that you have "no certainty-confidence at all". Answering 2, 3 or 4 means that the level of confidence-certainty is gradually increased while answering 5 responds to "feeling the most certain-confident". There isn't a right or wrong answer, as the answer you give expresses the way you feel best.

I can always assess that my baby receives enough milk	1	2	3	4	5
I can always cope successfully with breastfeeding, as I have done before with other challenges	1	2	3	4	5

Appendices

I can always breastfeed my baby without using formula	1	2	3	4	5
I can always guarantee that my baby breastfeeds correctly during the whole duration of breastfeeding	1	2	3	4	5
I can always complete the process of breastfeeding with satisfaction	1	2	3	4	5
I can always achieve to breastfeed even when my baby cries	1	2	3	4	5
I can always preserve my willingness to breastfeed	1	2	3	4	5
I can always breastfeed when family members are present	1	2	3	4	5
I can always be satisfied with my breastfeeding experience	1	2	3	4	5
I can always manage the fact that breastfeeding is time consuming	1	2	3	4	5
I can always complete breastfeeding with one breast before changing to the other	1	2	3	4	5
I can always continue breastfeeding in every meal	1	2	3	4	5
I can always cope with my baby's needs on breastfeeding	1	2	3	4	5
I can always understand when my baby has stopped breastfeeding	1	2	3	4	5
<i>Thank you very much. Only 3 questions were left!</i>					
<i>QUESTIONS ON MOTHER'S INTENTION TO BREASTFEED</i>					
24. When did you first decide how you would feed your baby? [<i>Read all the answers</i>]					
Before you became Pregnant	1	During Pregnancy	2	After the baby was born	3

25. Who has helped you to decide how to feed your baby? [*Read each option from 2-11 and circle all the positive responses, otherwise circle answer 1*]

Nobody/ My decision	1	Midwife	7
My partner	2	My Doctor/ gynecologist	8
My mother	3	My pediatrician	9
My mother in-law	4	Previous experience	10
Other relatives	5	Books/ magazines/ internet	11
Friends/ co-workers	6	Prenatal class/ Breastfeeding lecture	12

26. If you are breastfeeding or breastfed, when did you decide the duration that you would breastfeed your baby?

Before you became Pregnant	1	During Pregnancy	2	After the baby was born	3
				Don;' t know	4

QUESTIONS ON THE CURRENT EMPLOYMENT STATUS OF THE MOTHER

27. Which is your current employment status? [*Read all the answers and circle the most appropriate*]

Maternity leave	1	Self-Employed	4
Employed – Full Time	2	Leave without salary/ payment	5
Part Time	3	Un employed	6
		Other	

Thank you very much for your time!

Your participation is of high importance!

Appendix J: 4th Month's Questionnaire

Ημερομηνία:

Κωδικός: _____

ΜΕΛΕΤΗ ΓΙΑ ΤΟΝ ΜΗΤΡΙΚΟ ΘΗΛΑΣΜΟ

ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ 4ου ΜΗΝΑ

ΕΡΩΤΗΣΕΙΣ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΣΙΤΙΣΗ ΤΟΥ ΒΡΕΦΟΥΣ																									
1. Το μωρό σας συνεχίζει να θηλάζει; 1 ΝΑΙ 2 ΟΧΙ 3 ΔΕΝ ΘΗΛΑΣΑ ΚΑΘΟΛΟΥ (Εάν η απάντηση είναι ΝΑΙ προχωρήστε στην Ερώτηση 4)																									
2. Εάν όχι, σε ποια ηλικία το μωρό σας σταμάτησε να θηλάζει; (Δηλ. Το μωρό σας έχει κλείσει μηνών όταν διακόψατε το μητρικό θηλασμό;)																									
<table border="1"> <thead> <tr> <th colspan="3">ΕΒΔΟΜΑΔΕΣ</th> <th colspan="4">ΜΗΝΕΣ</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> </table>										ΕΒΔΟΜΑΔΕΣ			ΜΗΝΕΣ				1	2	3	1	2	3	4		
ΕΒΔΟΜΑΔΕΣ			ΜΗΝΕΣ																						
1	2	3	1	2	3	4																			
3. Θηλάσατε όσο θα θέλατε; 1 ΝΑΙ 2 ΟΧΙ																									
4. Πως ταΐζετε το μωρό σας;																									
Μόνο μητρικό γάλα									1																
Κυρίως μητρικό γάλα αλλά και φόρμουλα									2																
Κυρίως φόρμουλα αλλά και μητρικό γάλα									3																
Μόνο φόρμουλα									4																
Άλλο (παρακαλώ προσδιορίστε) _____									5																
5. Μέχρι σήμερα έχει το μωρό σας πάρει																									
Νερό; 1 ΝΑΙ 2 ΟΧΙ 9 ΔΕΝ ΓΝΩΡΙΖΩ																									
Τσάι (π.χ kinderte tea, γλυκάνισος); 1 ΝΑΙ 2 ΟΧΙ 9 ΔΕΝ ΓΝΩΡΙΖΩ																									
Χυμό φρούτου/ λαχανικών; 1 ΝΑΙ 2 ΟΧΙ 9 ΔΕΝ ΓΝΩΡΙΖΩ																									
6. Σε ποια ηλικία δόθηκαν υγρά (π.χ νερό, τσάι, χυμός φρούτων) για πρώτη φορά; (Δηλ. Το μωρό σας έχει κλείσει μηνών όταν έλαβε υγρά για πρώτη φορά;)																									
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1	2	3	1	2	3	4																			
7. Πόσο συχνά παίρνει το μωρό σας																									
<table border="1"> <thead> <tr> <th></th> <th>Φορές/ ημέρα</th> <th>Φορές/ Εβδομάδα</th> <th>Φορές/ μήνα</th> </tr> </thead> <tbody> <tr> <td>Νερό</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Τσάι (π.χ kinderte tea, γλυκάνισος)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Χυμό φρούτου/ λαχανικών</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>											Φορές/ ημέρα	Φορές/ Εβδομάδα	Φορές/ μήνα	Νερό				Τσάι (π.χ kinderte tea, γλυκάνισος)				Χυμό φρούτου/ λαχανικών			
	Φορές/ ημέρα	Φορές/ Εβδομάδα	Φορές/ μήνα																						
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Χυμό φρούτου/ λαχανικών																									
8. Μέχρι σήμερα έχει το μωρό σας πάρει																									
Φρουτόκρεμα; 1 ΝΑΙ 2 ΟΧΙ 9 ΔΕΝ ΓΝΩΡΙΖΩ																									
Άλλες κρέμες (π.χ φαρίν λακτέ, ρυζάλευρο); 1 ΝΑΙ 2 ΟΧΙ 9 ΔΕΝ ΓΝΩΡΙΖΩ (Προσδιορίστε _____)																									
Λιωμένο φαγητό ή στερεή τροφή; 1 ΝΑΙ 2 ΟΧΙ 9 ΔΕΝ ΓΝΩΡΙΖΩ (Προσδιορίστε _____)																									
9. Αν ναι σε ποια ηλικία δόθηκαν ημι-στερεές ή στερεές τροφές (π.χ. ρυζάλευρο, φρουτόκρεμα, λιωμένο φαγητό) για πρώτη φορά; (Δηλ. Το μωρό σας έχει κλείσει μηνών όταν έλαβε ημι-στερεές ή στερεές τροφές για πρώτη φορά;)																									
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ΕΒΔΟΜΑΔΕΣ			ΜΗΝΕΣ																						
1	2	3	1	2	3	4																			

10. Πόσο συχνά παίρνει το μωρό σας

	Φορές/ ημέρα	Φορές/ Εβδομάδα	Φορές/ μήνα
Φρουτόκρεμα; Άλλες κρέμες (π.χ φαρίν λακτέ, ρυζάλευρο); Λιωμένο φαγητό ή στερεή τροφή; (Προσδιορίστε _____)			

11. Μπορείτε να μου πείτε ποιες από τις πιο κάτω τροφές πήρε το μωρό σας τις τελευταίες 24 ώρες;

Μητρικό Γάλα	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Γάλα σκόνη (Φόρμουλα)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Γάλα Φρέσκο (αγελαδινό, κατσικόσιο κτλ)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Άλλα γαλακτοκομικά προϊόντα (Προσδιορίστε _____)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Νερό ή ζαχαρόνερο	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Τσάι (π.χ kinderte tea, γλυκάνισος, χαμομήλι)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Χυμό φρούτων και λαχανικών	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Ρυζάλευρο	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Φρουτόκρεμα (Εμπορίου)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Άλλη κρέμα (Προσδιορίστε _____)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Φρούτα (κομμάτια, κρέμα-πουρέ, κομμάτια)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Λαχανικά	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Σούπες	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Δημητριακά για Βρέφη	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Άλλα δημητριακά και αμυλούχα προϊόντα: κράκερς, ψωμί, μακαρόνια, ρύζι, μπισκότα κτλ	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Άσπρο Κρέας (π.χ Κοτοπουλο)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Κόκκινο Κρέας (π.χ βοδινό)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Ψάρι	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Αυγά	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Γλυκά: μπισκότα, κέικ	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Άλλα Τρόφιμα (Προσδιορίστε _____)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Φαρμακευτική Αγωγή (Οποιαδήποτε Μορφή) Προσδιορίστε _____	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
Συμπληρώματα (Βιταμίνη D, άλλες Βιταμίνες κτλ) Προσδιορίστε _____	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ

12. Σας δόθηκαν κάποια φυλλάδια ή τρόφιμα που προωθούν τα υποκατάστατα του μητρικού γάλακτος μετά τη γέννα (πχ στον παιδίατρό σας ή στο φαρμακείο);

1 NAI 2 OXI

13. Πόσων μηνών/ εβδομάδων ήταν το μωρό σας όταν του δώσατε πιπίλα για πρώτη φορά;

Δεν έδωσα μέχρι σήμερα πιπίλα στο μωρό μου

1

Appendices

1 εβδομάδα	2
2-3 εβδομάδων	3
1 μήνα	4
2-3 μηνών	5
4 μηνών	6

ΕΡΩΤΗΣΕΙΣ ΣΧΕΤΙΚΑ ΤΗΝ ΚΟΙΝΩΝΙΚΗ ΣΤΗΡΙΞΗ Perinatal Infant Care Social Support (PICSS) Scale

1. *Functional Social Support Leahy-Warren et al., (2005, 2007, 2010, 2011)*

Ακολουθεί μια σειρά από 16 προτάσεις/δηλώσεις που αφορούν την στήριξη σε σχέση με τη φροντίδα του μωρού σας που ήταν και είναι διαθέσιμη σε σας μετά **τη γέννηση του μωρού σας**. Αφού σας διαβάσω κάθε μια από τις προτάσεις θα αναμένω να μου δώσετε μια απάντηση σε μια κλίμακα από το 1 μέχρι το 4, όπου το 1 σημαίνει ότι διαφωνείτε απόλυτα με την συγκεκριμένη πτυχή της στήριξης, 2 ότι διαφωνείτε, 3 ότι συμφωνείτε και 4 ότι συμφωνείτε απόλυτα. Παρακαλώ να μου δώσετε μια απάντηση και στις 16 ερωτήσεις αφού βάσει των απαντήσεων μπορεί να υπολογιστεί ένα συνολικό σκορ. Δεν υπάρχει σωστό ή λάθος, αφού θα δηλώσετε την απάντηση που εκφράζει καλύτερα το πώς εσείς αισθάνεστε – και αναφερόμαστε σε όλη αυτή την περίοδο των 4 μηνών **από τη γέννηση του μωρού σας μέχρι και σήμερα**.

	Διαφωνώ Απόλυτα	Διαφωνώ	Συμφωνώ	Συμφωνώ Απόλυτα
1. Μπορούσα να λάβω πληροφόρηση				
Πως να ταΐσω το μωρό	1	2	3	4
Πως να αλλάξω και να ντύσω το μωρό	1	2	3	4
Πως να λούσω το μωρό	1	2	3	4
Πως να καθησυχάσω και να κοιμίσω το μωρό	1	2	3	4
2. Μπορούσα να λάβω πληροφόρηση σε σχέση με τη φροντίδα του σώματος μου μετά τον τοκετό	1	2	3	4
3. Είχα ευκαιρίες να μάθω από τις εμπειρίες άλλων μαμιάδων	1	2	3	4
4. Μπορούσα να λάβω αξιόπιστη πληροφόρηση σχετικά με τη φροντίδα του μωρού μου	1	2	3	4
5. Είχα κάποιον να μου παρέχει χέρι βοήθειας				
Να ταΐσω το μωρό	1	2	3	4
Να αλλάξω και να ντύσω το μωρό	1	2	3	4
Να λούσω το μωρό	1	2	3	4
Να καθησυχάσω και να κοιμίσω το μωρό	1	2	3	4
6. Είχα κάποιον να με βοηθά με τις καθημερινές δουλειές του σπιτιού	1	2	3	4
7. Δεν ήμουν μόνη μου στη φροντίδα του μωρού	1	2	3	4

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8. Μπορούσα να βρίσκω χρόνο για τον εαυτό μου	1	2	3	4
9. Είχα ανθρώπους στους οποίους μπορούσα να στηριχτώ όταν τα πράγματα δεν πάνε και τόσο καλά	1	2	3	4
10. Είχα κάποιον να με νοιάζεται και να με φροντίζει	1	2	3	4
11. Είχα κάποιον να μιλήσω για το πώς αισθάνομαι	1	2	3	4
12. Εάν χρειαζόμουν κάποια συμβουλή, υπήρχε κάποιος να με βοηθήσει να εξεύρω τρόπους για να αντιμετωπίσω την κατάσταση	1	2	3	4
13. Είχα άτομα να μιλήσω και να μοιραστώ τις εμπειρίες μου μαζί τους	1	2	3	4
14. Είχα άτομα να μου δείξουν την εκτίμησή τους για τη φροντίδα που παρέχω στο μωρό μου	1	2	3	4
15. Τα κοντινά μου άτομα κατανοούσαν ότι ήταν φυσιολογικό να χρειάζομαι βοήθεια	1	2	3	4
16. Λάμβανα θετική ανταπόκριση και ανατροφοδότηση από τους επαγγελματίες υγείας για την ικανότητά μου να φροντίζω το μωρό μου	1	2	3	4

2. Structural Social Support Leahy-Warren et al., (2005, 2007, 2010, 2011)

Για την κάθε μια πτυχή και είδος στήριξης – και αναφέρομαι στην (1) παροχή πληροφόρησης, (2) στην έμπρακτη βοήθεια, (3) στη συναισθηματική στήριξη και (4) στην προσφορά αναγνώρισης, θα θέλαμε να δούμε ποιά είναι τα άτομα από το οικογενειακό, φιλικό και ευρύτερο σας περιβάλλον από τα οποία αναμένετε να παρέχουν στήριξη και βοήθεια όσον αφορά στη φροντίδα του βρέφους Μπορείτε να ονομάσετε ένα άτομο, παραπάνω, ακόμα και όλους ή και κανένα αναλόγως του πώς αισθάνεστε.

	Πληροφόρηση	Απτή βοήθεια	Συναισθηματική στήριξη	Εκτίμηση και αναγνώριση
	Ποιός/Ποιοί αποτελούν για σας πηγή πληροφόρησης π.χ. σε σχέση με το τάισμα, λούσιμο, αλλαγμα, κοίμισμα του μωρού	Ποιός/Ποιοί παρέχουν έμπρακτη βοήθεια π.χ. στο τάισμα, λούσιμο, αλλαγμα, κοίμισμα του μωρού	Ποιός/Ποιοί εκφράζουν την αγάπη, φροντίδα και το σεβασμό τους προς εσάς σε σχέση με τη φροντίδα του μωρού σας.	Από ποιους λαμβάνεται έπαινο και αναγνώριση για την καλή δουλειά που κάνετε σχετικά την φροντίδα του μωρού σας
(i) Σύζυγος/Σύντροφος				
(ii) Μητέρα				
(iii) Πατέρας				
(iv) Πεθερά/Μητέρα του Συντρόφου				
(v) Πεθερός/Πατέρας του Συντρόφου				
(vi) Οικιακή Βοηθός/ Νταντά				

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(vii) Αδέρφια				
(viii) Φίλοι/ες				
(ix) Γείτονες				
(x) Μαία (ες)/ Νοσηλεύτρια (ες)				
(xi) Παιδίατρος				
(xii) Γυναικολόγος				
(xiii) Άλλοι επαγγελματίες υγείας				
(xiv) Άλλοι (προσδιορίστε)				

14. Νιώσατε ποτέ άβολα να θηλάσετε σε δημόσιο χώρο;

1 ΝΑΙ 2 ΟΧΙ 3 ΔΕΝ ΘΗΛΑΣΑ ΠΟΤΕ ΣΕ ΔΗΜΟΣΙΟ ΧΩΡΟ

15. Ποιος είναι ο τόπος Διαμονής σας;

1 Λεμεσός 2 Λάρνακα 3 Πάφος 4 Αμμόχωστος

16. 1 Πόλη 2 Επαρχία

17. Διεύθυνση: _____ Τ.Κ. _____

Ευχαριστούμε πάρα πολύ για το χρόνο σας.

Η συμβολή σας έχει τεράστια σημασία!

Date:

BREASTFEEDING PRACTICES STUDY IN CYPRUS

4TH MONTH QUESTIONNAIRE

QUESTIONS ON BREASTFEEDING PRACTICES													
18. Does your baby continue to breastfeed? (If YES proceed to Question 4)						1 YES		2 NO					
19. If not, at which age did your baby stop breastfeeding? (Did your baby reach..... months when you stopped breastfeeding?)						WEEKS				MONTHS			
						1	2	3	4	1	2	3	4
20. Did you breastfeed as long as you wanted to;						1 YES		2 NO					
21. How do you feed your baby;													
Breast milk only						1							
Mostly Breast milk, but also formula						2							
Mostly formula but also breast milk						3							
Formula only						4							
Other (please specify) _____						5							
22. Until today, has your baby received													
Water or Sugarwater?						1 YES		2 NO		9 DON T KNOW			
Tea (e.g kinderte tea, anise)?						1 YES		2 NO		9 DON T KNOW			
Fruit/ Vegetable Juice?						1 YES		2 NO		9 DON T KNOW			
23. How old was your baby when she/he first received liquids (water, sugar water, tea, fruit juice etc)? (Did your baby reach..... months when he/she received liquids for the first time?)						WEEKS				MONTHS			
						1	2	3	4	1	2	3	4
24. How often does your baby drink													
						Times/Day		Times/Week		Times/Month			
Water or sugarwater?													
Tea (e.g kinderte tea, anise)?													
Fruit/ Vegetable Juice?													
25. Until today, has your baby ever had													
Fruit puree/ cream;						1 YES		2 NO		9 DON'T KNOW			
Other creams (e.g. farin lactee);						1 YES		2 NO		9 DON'T KNOW			
Mashed food or solid food; (Specify_____)						1 YES		2 NO		9 DON'T KNOW			
26. If yes, at what age did you start giving your baby semi-solid or solid food (i.e rice crem, fruit puree, mashed food) for the first time; Did your baby reach..... months when he/she received semi-solid						WEEKS				MONTHS			
						1	2	3	4	1	2	3	4

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or solid food for the first time?)					
27. How often does your baby have					
		Times/Day	Times/Week	Times/Month	
Fruit puree/ cream?					
Other creams (e.g. farine lactée, rice cream)?					
Mashed food or solid food? (specify_____)					
28. Can you tell me which of the food below, your baby has consumed in the last 24 hours;					
Breast milk	1	YES	2	NO	9 DON'T KNOW
Formula milk	1	YES	2	NO	9 DON'T KNOW
Fresh milk (cow, goat's milk)	1	YES	2	NO	9 DON'T KNOW
Other dairy products (specify_____)	1	YES	2	NO	9 DON'T KNOW
Water or sugarwater	1	YES	2	NO	9 DON'T KNOW
Tea (e.g kinderte tea, anise, chamomile)	1	YES	2	NO	9 DON'T KNOW
Fruit/ Vegetable Juice	1	YES	2	NO	9 DON'T KNOW
Rice cream	1	YES	2	NO	9 DON'T KNOW
Fruit puree (commercial)	1	YES	2	NO	9 DON'T KNOW
Other cream (Specify_____)	1	YES	2	NO	9 DON'T KNOW
Fruit	1	YES	2	NO	9 DON'T KNOW
Vegetables	1	YES	2	NO	9 DON'T KNOW
Soup	1	YES	2	NO	9 DON'T KNOW
Baby cereals	1	YES	2	NO	9 DON'T KNOW
Other cereals and starch products: crackers, bread, pasta, rice, cookies etc	1	YES	2	NO	9 DON'T KNOW
White meat (i.e chicken)	1	YES	2	NO	9 DON'T KNOW
Red meat (i.e beef)	1	YES	2	NO	9 DON'T KNOW
Fish	1	YES	2	NO	9 DON'T KNOW
Eggs	1	YES	2	NO	9 DON'T KNOW
Sweets: cookies, cake	1	YES	2	NO	9 DON'T KNOW
Other food (specify _____)	1	YES	2	NO	9 DON'T KNOW
Drugs (any form) specify_____	1	YES	2	NO	9 DON'T KNOW
Supplements (Vitamin D, other vitamins etc) specify_____	1	YES	2	NO	9 DON'T KNOW
29. Were you given any leaflets or food that promote breast milk substitutes after birth (i.e at your pediatrician);					
		1	YES	2	NO

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30. How old was your baby when she/he was first given a pacifier?	
I have never given a pacifier to my baby	1
1 week	2
2-3 weeks	3
1 month	4
2-3 months	5
4 months	6

QUESTIONS ON INFANT CARE SOCIAL SUPPORT

Perinatal Infant Care Social Support (PICSS) Scale

3. *Functional Social Support Leahy-Warren et al., (2005, 2007, 2010, 2011)*

The following 16 statements ask about the support regarding your baby's care that was and is available to you after your baby's birth. We refer to the period of the last four months, **from the baby's birth until today**. After I read to you each of the following statements you are requested to give me an answer at scale from 1 to 4 where 1 means strongly disagree, 2 disagree, 3 agree and 4 strongly agree. There are no right or wrong questions as you are requested to provide the answer that is more appropriate for you. Please answer all questions.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I can get information on				
Feeding	1	2	3	4
Changing/ dressing	1	2	3	4
Bathing	1	2	3	4
Comfort/settling	1	2	3	4
2. I can get information on taking	1	2	3	4
care of my body after child birth				
3. I can learn from other mothers'	1	2	3	4
experiences				
4. I can get consistent information	1	2	3	4
regarding infant care				
5. I can get 'hands on help' with				
my baby:				
Feeding	1	2	3	4
Changing/ Dressing	1	2	3	4
Bathing	1	2	3	4
Comfort/ settling	1	2	3	4
6. I have someone to help me with				
routine housework				
7. I won't be on my own taking	1	2	3	4
care of my baby				
8. I can make time for myself	1	2	3	4
9. I have people to count on things	1	2	3	4
go wrong				

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10. I have someone to care and comfort me	1	2	3	4
11. I have someone to talk about how I feel				
12. If I need advice there is someone who will assist me	1	2	3	4
13. I have people to talk to and share experiences with	1	2	3	4
14. I have people who will show me appreciation for the care I give to my baby	1	2	3	4
15. People close to me understand that it is okay for me to need help	1	2	3	4
16. I can get positive feedback from health care professionals about my ability to care for my baby	1	2	3	4

4. Structural Social Support Leahy-Warren et al., (2005, 2007, 2010, 2011)

For each type of support -and this might be (1) informational support, (2) instrumental support, (3) emotional support and (4) appraisal- please indicate the persons that you expect to be supportive and helpful to you in caring for your baby. You can select/ tick one, more, all or even none of the people that are referred at the list below. If any of the names below is not relevant or applicable, please leave blank.

	Informational	Instrumental	Emotional	Appraisal
	Provide information about caring for your baby in relation to feeding, changing, bathing and settling your baby	Carry out infant care tasks, such as feeding, changing, bathing and settling your baby	Show that they care, love and respect you in caring for your baby.	Praise you for doing a good job in caring for your baby
(i) Husband/ Partner				
(ii) Mother				
(iii) Father				
(iv) Husband/Partners ' mother				
(v) Husband/Partners ' father				
(vi) House keeper/ Nunny				
(vii) Sister(s)/ Brother(s)/				
(viii) Friend (s)				
(ix) Neighbour(s)				

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(x) Midwife(s) /Nurse(s)				
(xi) Pediatrician				
(xii) Gynecologist				
(xiii) Other Health Professionals				
(xiv) Others (Specify)				

17. Have ever felt uncomfortable breastfeeding in public?

1 YES 2 NO 3 I have never breastfed in public

18. Which district do you live?

1 Limassol 2 Larnakal 3 Paphos 4 Ammochostos

19. You live in the: 1 City 2 County

20. Address: _____ P.C.: _____

Thank you very much for your time!

Appendix K: 6th Month's Questionnaire

ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ 6^{ου} ΜΗΝΑ

ΜΗΤΡΙΚΟΣ ΘΗΛΑΣΜΟΣ

Ημερομηνία:

ΚΩΔΙΚΟΣ _____

ΕΡΕΥΝΑ ΓΙΑ ΤΟΝ ΜΗΤΡΙΚΟ ΘΗΛΑΣΜΟ ΣΤΗΝ ΚΥΠΡΟ

ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ 6^{ου} ΜΗΝΑ

ΜΕΡΟΣ Α: ΣΙΤΙΣΗ ΤΟΥ ΒΡΕΦΟΥΣ

ΕΡΩΤΗΣΕΙΣ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΣΙΤΙΣΗ ΤΟΥ ΒΡΕΦΟΥΣ

1. Το μωρό σας συνεχίζει να θηλάζει;										1	NAI	2	OXI					
										3	ΔΕΝ ΘΗΛΑΣΑ ΚΑΘΟΛΟΥ							
(Εάν απάντησε NAI προχωρήστε στην Ερώτηση 4)																		
2. Εάν όχι, σε ποια ηλικία το μωρό σας σταμάτησε να θηλάζει; (Δηλ. Το μωρό σας έχει κλείσει μηνών όταν διακόψατε το μητρικό θηλασμό;)										ΕΒΔΟΜΑΔΕ Σ			ΜΗΝΕΣ					
										1	2	3	1	2	3	4	5	6
3. Θηλάσατε όσο θα θέλατε;										1	NAI	2	OXI					
4. Πως ταΐζετε το μωρό σας;																		
Μόνο μητρικό γάλα														1				
Κυρίως μητρικό γάλα αλλά και φόρμουλα														2				
Κυρίως φόρμουλα αλλά και μητρικό γάλα														3				
Μόνο φόρμουλα														4				
Άλλο (παρακαλώ προσδιορίστε) _____														5				
5. Έχετε χρησιμοποιήσει ποτέ αντλία εξαγωγής μητρικού γάλακτος;										1	NAI	2	OXI					
6. Εάν NAI, έχετε χρησιμοποιήσει ποτέ αντλία στο χώρο εργασίας;										1	NAI	2	OXI					
7. Μέχρι σήμερα έχει το μωρό σας πάρει																		
Νερό										1	NAI	2	OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ				
Τσάι (π.χ kinderte tea, γλυκάνισος)										1	NAI	2	OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ				

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Χυμό φρούτου/ λαχανικών	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
8. Σε ποια ηλικία δόθηκαν υγρά (π.χ νερό, χαμομήλι, χυμός φρούτων) για πρώτη φορά; (Δηλ. Το μωρό σας έχει κλείσει μηνών όταν έλαβε υγρά για πρώτη φορά;)	ΕΒΔΟΜΑΔΕΣ Σ		ΜΗΝΕΣ
	1	2	3
	1	2	3
	4	5	6
9. Πόσο συχνά παίρνει το μωρό σας	Φορές/ ημέρα Φορές/ Εβδομάδα Φορές/ μήνα		
Νερό			
Τσάι (π.χ kinderte tea, γλυκάνισος, χαμομήλι)			
Χυμό φρούτου/ λαχανικών			
10. Μέχρι σήμερα έχει το μωρό σας πάρει			
Φρουτόκρεμα;	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
Άλλες κρέμες (π.χ φαρίν λακτέ, ρυζάλευρο);	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
(Προσδιορίστε _____)			
Λιωμένο φαγητό ή στερεή τροφή;	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
(Προσδιορίστε _____)			
11. Αν ναι σε ποια ηλικία δόθηκαν ημι-στερεές ή στερεές τροφές (π.χ. ρυζάλευρο, φρουτόκρεμα, λιωμένο φαγητό) για πρώτη φορά; (Δηλ. Το μωρό σας έχει κλείσει μηνών όταν έλαβε ημι-στερεές ή στερεές τροφές για πρώτη φορά;)	ΕΒΔΟΜΑΔΕΣ		ΜΗΝΕΣ
	1	2	3
	1	2	3
	4	5	6
12. Πόσο συχνά παίρνει το μωρό σας	Φορές/ ημέρα Φορές/ Εβδομάδα Φορές/ μήνα		
Φρουτόκρεμα;			
Άλλες κρέμες (π.χ φαρίν λακτέ, ρυζάλευρο);			
(Προσδιορίστε _____)			
Λιωμένο φαγητό ή στερεή τροφή;			
(Προσδιορίστε _____)			
13. Μπορείτε να μου πείτε ποιες από τις πιο κάτω τροφές πήρε το μωρό σας τις τελευταίες 24 ώρες;			
1. Μητρικό Γάλα	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
2. Γάλα σκόνη (Φόρμουλα)	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
3. Γάλα Φρέσκο (αγελαδινό, κατσικίσιο κτλ)	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ
4. Άλλα γαλακτοκομικά προϊόντα (Προσδιορίστε _____)	1 NAI	2 OXI	9 ΔΕΝ ΓΝΩΡΙΖΩ

5. Νερό ή ζαχαρόνερο	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
6. Τσάι (π.χ kinderte tea, γλυκάνισος, χαμομήλι)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
7. Χυμό φρούτων και λαχανικών	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
8. Ρυζάλευρο	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
9. Φρουτόκρεμα (Εμπορίου)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
10. Άλλη κρέμα (Προσδιορίστε _____)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
11. Φρούτα	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
12. Λαχανικά	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
13. Σούπες	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
14. Δημητριακά για Βρέφη	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
15. Άλλα δημητριακά και αμυλούχα προϊόντα: κράκερς, ψωμί, μακαρόνια, ρύζι, μπισκότα κτλ	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
16. Άσπρο Κρέας (π.χ Κοτοπουλο)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
17. Κόκκινο Κρέας (π.χ βοδινό)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
18. Ψάρι	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
19. Αυγά	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
20. Γλυκά: μπισκότα, κέικ	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
21. Άλλα Τρόφιμα (Προσδιορίστε _____)	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
22. Φαρμακευτική Αγωγή (Οποιαδήποτε Μορφή) Προσδιορίστε _____	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ
23. Συμπληρώματα (Βιταμίνη D, άλλες Βιταμίνες κτλ) Προσδιορίστε _____	1	NAI	2	OXI	9	ΔΕΝ ΓΝΩΡΙΖΩ

ΜΕΡΟΣ Β: ΛΟΓΟΙ ΔΙΑΚΟΠΗΣ ΜΗΤΡΙΚΟΥ ΘΗΛΑΣΜΟΥ

Να απαντηθεί από τις μητέρες που έχουν απαντήσει **OXI/ ΔΕΝ ΘΗΛΑΣΑ ΚΑΘΟΛΟΥ** στη ερώτηση 1

24. Ποιοι είναι οι λόγοι που διακόψατε το μητρικό θηλασμό ή δεν θηλάσατε καθόλου; (Να δοθεί απάντηση για κάθε ένα από τους λόγους που αναφέρονται πιο κάτω. Κάθε απάντηση να δίνεται σε κλίμακα από το 1 μέχρι το 5 όπου το 1 σημαίνει διαφωνώ απόλυτα, το 2 διαφωνώ, το 3 ούτε διαφωνώ ούτε συμφωνώ, το 4 συμφωνώ και το 5 συμφωνώ απόλυτα.)

	Διαφωνώ Απόλυτα	Διαφωνώ	Ούτε Διαφωνώ, ούτε συμφωνώ	Συμφωνώ	Συμφωνώ Απόλυτα
Ανεπαρκές Γάλα	1	2	3	4	5
Προβλήματα με το στήθος (πέτρωμα, μαστίτιδα, εισέχουσες θηλές, τραυματισμός θηλών)	1	2	3	4	5
Επιστροφή στην εργασία	1	2	3	4	5
Προηγούμενη αρνητική εμπειρία θηλασμού	1	2	3	4	5
Κάπνισμα	1	2	3	4	5
Κούραση/ κατάθλιψη/ άγχος	1	2	3	4	5
Δεν ήθελα/ Προσωπικοί λόγοι	1	2	3	4	5
Υποχρεώσεις στο σπίτι/ άλλα παιδιά	1	2	3	4	5
Ανησυχία για την ποσότητα που λαμβάνει	1	2	3	4	5
Πολύδυμη κύηση	1	2	3	4	5
Ανεπαρκής πρόσληψη βάρους	1	2	3	4	5
Το μωρό δεν ήθελε το γάλα μου	1	2	3	4	5
Προωρότητα	1	2	3	4	5
MENN	1	2	3	4	5
Αρρώστια του μωρού	1	2	3	4	5
Άλλο (προσδιορίστε _____)					

ΕΡΩΤΗΣΕΙΣ ΣΧΕΤΙΚΑ ΤΗ ΣΤΗΡΙΞΗ ΤΗΣ ΘΗΛΑΖΟΥΣΑΣ ΜΗΤΕΡΑΣ ΣΤΟ ΕΡΓΑΣΙΑΚΟ ΤΗΣ ΠΕΡΙΒΑΛΛΟΝ

Workplace Breastfeeding Support (WBSS) Scale

25. Ποια είναι η παρούσα κατάσταση εργοδότησής σας;

Εργοδοτούμενη: 1 Πλήρης Απασχόληση 3 Αυτοεργοδοτούμενη
2 Μερική Απασχόληση 4 Άνεργη

26. Ποια είναι η ηλικία του μωρού σας; _____

27. Πόσων μηνών ήταν το μωρό σας όταν επιστρέψατε στην εργασίας σας; _____

28. Όταν επιστρέψατε στην εργασία σας και ΔΕΝ είχατε πλήρη απασχόληση, τι διευθετήσεις έχετε κάνει; _____

29. Ποιες διευθετήσεις έχετε κάνει για τη φροντίδα του μωρού σας; _____

30. Γνωρίζετε κάποιο άτομο στο οικογενειακό, φιλικό ή εργασιακό σας περιβάλλον που συνέχισε να θηλάζει μετά την επιστροφή της στην εργασία;
1 ΝΑΙ 2 ΟΧΙ
31. Πιστεύετε ότι ο χώρος εργασίας σας επηρέασε/ θα επηρεάζε την απόφαση σας να συνεχίσετε να θηλάζετε η να διακοψετε το θηλασμό μετά την επιστροφή σας στην εργασία; 1 ΝΑΙ 2 ΟΧΙ

Ακολουθεί μια σειρά από 12 προτάσεις αναφορικά με τη στήριξη που παρέχεται σε εσάς ή σε άλλες μητέρες σχετικά με το μητρικό θηλασμό στο χώρο εργασίας σας. Αφού σας διαβάσω κάθε μια από τις προτάσεις, θα ήθελα να μου δώσετε μια απάντηση σε μια κλίμακα από το 1 μέχρι το 7, όπου το 1 σημαίνει ότι διαφωνείτε απόλυτα με την συγκεκριμένη πτυχή παροχής στήριξης και 7 ότι συμφωνείτε απόλυτα. Δεν υπάρχει σωστό ή λάθος, αφού θα δηλώσετε την απάντηση που εκφράζει καλύτερα το πώς εσείς αισθάνεστε σε όλη αυτή την περίοδο που προηγήθηκε από την επιστροφή σας στην εργασία μέχρι και σήμερα (*Να απαντηθεί από όλες τις συμμετεχόντες*).

	Διαφωνώ Απόλυτα						Συμφωνώ Απόλυτα
1. Οι συνάδελφοι μου συμφωνούν ότι ο μητρικός θηλασμός είναι προτιμότερος για την υγεία του μωρού μου παρά η φόρμουλα	1	2	3	4	5	6	7
2. Οι συνάδελφοι μου είναι υποστηρικτικοί και θα με κάλυπταν (στα καθήκοντα μου εάν ήθελα) να αντλήσω γάλα	1	2	3	4	5	6	7
3. Οι συνάδελφοι μου δεν θα με κορόιδευαν εάν κάποιες φορές έσταζε γάλα στα ρούχα μου	1	2	3	4	5	6	7
4. Ο μητρικός θηλασμός είναι συχνή πρακτική στο χώρο εργασίας μου	1	2	3	4	5	6	7
5. Ο προϊστάμενός μου υποστηρίζει το μητρικό θηλασμό	1	2	3	4	5	6	7
6. Οι συνάδελφοι με ακούνε όταν μιλώ για την εμπειρία μου με τον μητρικό θηλασμό	1	2	3	4	5	6	7
7. Θα ένιωθα άνετα να κάνω τακτικά διαλείμματα κατά τη διάρκεια της εργασίας μου για να αντλήσω γάλα	1	2	3	4	5	6	7
8. Στο χώρο εργασίας μου, υπάρχει καθορισμένος χώρος (π.χ. δωμάτιο θηλασμού) για να θηλάσω το μωρό μου ή ν' αντλήσω γάλα	1	2	3	4	5	6	7
9. Θα μπορούσα να βρω ένα ήσυχο χώρο, εκτός από την τουαλέτα, για να αντλήσω γάλα	1	2	3	4	5	6	7
10. Στο χώρο εργασίας μου, υπάρχει ψυγείο όπου θα μπορούσα να φυλάξω το γάλα μου	1	2	3	4	5	6	7

Appendices

11. Στο χώρο εργασίας υπάρχει αντλία θηλασμού για χρήση από τις θηλάζουσες μαμάδες	1	2	3	4	5	6	7
12. Στο χώρο εργασίας μου υπάρχει κέντρο βρεφών	1	2	3	4	5	6	7

Appendices

Date:

Code: _____

BREASTFEEDING PRACTICES STUDY IN CYPRUS

Questionnaire of 6th month

PART A: INFANT FEEDING

QUESTIONS ON BREASTFEEDING PRACTICES												
1. Does your baby continue to breastfeed? 1 YES 2 NO 3 HAVEN'T BREASTFED AT ALL (If the answer was YES move on to Question 4)												
2. If no, at which age your baby stopped breastfeeding; (Your baby was months when you stopped breastfeeding?)				WEEKS			MONTHS					
				1	2	3	1	2	3	4	5	6
3. Have you breastfed as long as you wanted to? NO										1 YES	2	
4. How do you feed your baby?												
Only breast milk										1		
Mainly breast milk, but also formula?										2		
Mainly formula, but also breast milk?										3		
Only formula										4		
Other (please specify) _____										5		
5. Have you ever used breast pump?										1 YES	2 NO	
6. If YES, have you ever used breast pump at your workplace? NO										1 YES	2	
7. Until today has your baby had												
Water				1 YES	2 NO	9	I DON'T KNOW					
Tea (i.e kinderte tea, anise)				1 YES	2 NO	9	I DON'T KNOW					
Fruit/vegetable juice				1 YES	2 NO	9	I DON'T KNOW					
8. At what age was your baby given liquids (water, chamomile, fruit juice) for the first time? (Your baby was months when she/he first received liquids for the first time?)				WEEKS			MONTHS					
				1	2	3	1	2	3	4	5	6
9. How often does your baby have												
										Times/day	Times/week	Times/month
Water?												
Tea (i.e kinderte tea, anise, chamomile)?												
Fruit/vegetable juice?												
10. Until today has your baby ever had												
Fruit cream/puree?				1 YES	2 NO	9	I DON'T KNOW					
Other creams (e.g farin lactee, rice cream)?				1 YES	2 NO	9	I DON'T KNOW					

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(Please specify _____) Mashed or solid food? 1 YES 2 NO 9 I DON'T KNOW (Please specify _____)													
11. If YES at which age were semi-solid or solid food given for the first time? (i.e rice cream, fruit cream/puree, mashed food) <i>(Your baby was months when she/he first received semi-solid or solid food for the first time?)</i>						WEEKS			MONTHS				
						1	2	3	1	2	3	4	5	6
12. How often does your baby have Times/day Times/week Times/month Fruit cream? Other creams (rice cream, farin lactee)? (Please specify _____) Mashed or solid food? (Please specify _____)													
13. Can you tell me which of the following products has your baby consumed in the last 24 hours?													
1. Breast milk	1	YES	2	NO	9	I DON'T KNOW							
2. Formula	1	YES	2	NO	9	I DON'T KNOW							
3. Fresh milk (cow,goat etc)	1	YES	2	NO	9	I DON'T KNOW							
4. Other dairy products (Please specify _____)	1	YES	2	NO	9	I DON'T KNOW							
5. Water or sugarwater	1	YES	2	NO	9	I DON'T KNOW							
6. Tea (i.e kinderte tea, anise, chamomile)	1	YES	2	NO	9	I DON'T KNOW							
7. Fruit/vegetable juice	1	YES	2	NO	9	I DON'T KNOW							
8. Rice flour/ cream	1	YES	2	NO	9	I DON'T KNOW							
9. Fruit Cream (Processed)	1	YES	2	NO	9	I DON'T KNOW							
10. Other Cream (Please specify _____)	1	YES	2	NO	9	I DON'T KNOW							
11. Fruit	1	YES	2	NO	9	I DON'T KNOW							
12. Vegetables	1	YES	2	NO	9	I DON'T KNOW							
13. Soups	1	YES	2	NO	9	I DON'T KNOW							
14. Baby cereals	1	YES	2	NO	9	I DON'T KNOW							
15. Other cereals and starch products: crackers, bread, pasta, rice, biscuits etc	1	YES	2	NO	9	I DON'T KNOW							
16. White meat (i.e chicken)	1	YES	2	NO	9	I DON'T KNOW							
17. Red meat (i.e beef)	1	YES	2	NO	9	I DON'T KNOW							
18. Fish	1	YES	2	NO	9	I DON'T KNOW							
19. Eggs	1	YES	2	NO	9	I DON'T KNOW							
20. Sweets: biscuits, cake	1	YES	2	NO	9	I DON'T KNOW							
21. Other (Please specify _____)	1	YES	2	NO	9	I DON'T KNOW							
22. Drugs (any form) Please specify _____	1	YES	2	NO	9	I DON'T KNOW							
23. Supplements (Vitamin D, other vitamins, iron etc) specify _____	1	YES	2	NO	9	I DON'T KNOW							

PART B: REASONS FOR INTERRUPTING/ NOT COMMENCING BREASTFEEDING

This part must be answered by the mother who replied NO/ HAVEN 'T BREASTFED AT ALL in Question 1

24. What are the reasons of breastfeeding cessation or not commencing breastfeeding at all?
(Answers should to be given to all requisitions. Each answer should be given to a scale from 1 to 5 where 1 means strongly disagree, 2- disagree, 3 neither agree or disagree, 4-agree, 5-strongly agree)

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Inadequate milk	1	2	3	4	5
Breast health problems(engorgement mastitis, inverted nipples, injured nipples)	1	2	3	4	5
Return to work	1	2	3	4	5
Previous unpleasant breastfeeding experience	1	2	3	4	5
Smoking	1	2	3	4	5
Fatigue/depression/stress	1	2	3	4	5
Didn't want to/personal reasons	1	2	3	4	5
House responsibilities/ children	1	2	3	4	5
Concern regarding the quantity consumed	1	2	3	4	5
Multiple pregnancy	1	2	3	4	5
Inadequate weight gain	1	2	3	4	5
My baby didn't want my milk	1	2	3	4	5
Prematurity	1	2	3	4	5
NICU	1	2	3	4	5
Baby sickness	1	2	3	4	5
Other (specify _____)	1	2	3	4	5

QUESTIONS REGARDING THE SUPPORT THE BREASTFEEDING MOTHER ACCEPTS FROM THE WORKPLACE ENVIRONMENT

Workplace Breastfeeding Support (WBSS) Scale

25. What is your current employment status?
- | | |
|----------------------|------------------|
| 1 Full-time employed | 3 Self –employed |
| 2 Part-time employed | 4 Unemployed |
26. How old is your baby? _____
27. How old was your baby when you returned to work? _____
28. When you returned to work and you were **NOT** fulltime, what arrangements did you make? _____
29. What are the current arrangements for your child's care? _____
30. Do you know anyone else, at your company or elsewhere, who has continued to nurse after they returned to work? _____ 1
YES 2 NO
31. Do you feel that your workspace has impacted your decision **to continue or discontinue** nursing after your return to the workplace?
1 YES 2 NO

The following 12 sentences ask about the support provided to you or to other mothers regarding breastfeeding at your workplace. After I read to you each of the each of the following statements you are requested to provide the answer you feel is more appropriate in a scale from 1 to 7, where 1 means strongly disagree for the provision of the specific type of support and 7 strongly agree. There are no wrong or right answers, as you are requested to give the answer that best reflects of how you feel during the whole period after your return to work (**This part should be answered from ALL participants**).

	Strongly Disagree						Strongly Agree
1 My co-workers agree that breastfeeding is better for baby's health than formula feeding.	1	2	3	4	5	6	7
2 I have supportive co-workers who would cover for me if I needed to pump my milk.	1	2	3	4	5	6	7
3 My co-workers would not make fun of me if I would sometimes leak milk through my clothes.	1	2	3	4	5	6	7
4 Breastfeeding is common in my workplace.	1	2	3	4	5	6	7
5 I have a breastfeeding supportive supervisor	1	2	3	4	5	6	7
6 My co-workers listen to me talk about my breastfeeding experience.	1	2	3	4	5	6	7
7 I would feel comfortable taking several breaks during work hours to pump breast milk.	1	2	3	4	5	6	7

Appendices

8	In my workplace, there is a designated space (nursing room) to nurse my baby or pump breast milk.	1	2	3	4	5	6	7
9	I could easily find a quiet place other than the bathroom at my work to pump breast milk.	1	2	3	4	5	6	7
10	My workplace has a refrigerator that I could use to store my milk.	1	2	3	4	5	6	7
11	My workplace has a breast pump for nursing mothers to use	1	2	3	4	5	6	7
12	My workplace has an on-site daycare.	1	2	3	4	5	6	7

Appendix L: Permissions for the use of the Tools in the study

(a) WHO/ UNICEF BFHI self-assessment tool

UNICEF Hellenic Natcom <argyropoulos@unicef.gr> 30 Μαΐ (Πριν από 12 ημέρες)

προς Εμένα

Αγαπητή κ. Χατζηωνά,

Ασφαλώς και μπορείτε να το χρησιμοποιήσετε (αναφέροντας φυσικά την προέλευση).

Σας επισυνάπτουμε το αντίστοιχο αγγλικό όπως είναι αναρτημένο στο διαδίκτυο (WHO).

Καλή επιτυχία στο έργο σας,

Ανδρέας Αργυρόπουλος

Διεύθυνση Ενημέρωσης

Ελληνική Εθνική Επιτροπή UNICEF

(b) BSES Tool (Dr C. L. Dennis)

Cindy-Lee Dennis 10:34 μ.μ. (Πριν από 1 ώρα)

προς Εμένα

Αγγλικά

Ελληνικά

Μετάφραση μηνύματος

Απενεργοποίηση για: Αγγλικά

Dear Vasiliki

Thank you for your email and interest in my Breastfeeding Self-Efficacy Scale. I have attached the short-form translated into Greek for use in your study. Please let me know if I can be of further assistance.

Warm regards,

Cindy-Lee Dennis

Cindy-Lee Dennis, PhD
Professor in Nursing and Medicine, Dept. of Psychiatry;
Canada Research Chair in Perinatal Community Health;

Shirley Brown Chair in Women's Mental Health Research, Women's College Research Institute;

University of Toronto
155 College St
Toronto, Ontario
Canada M5T 1P8
Tel: [\(416\) 946-8608](tel:(416)946-8608)
www.cindyleedennis.ca

(c) PICSS Quetsionnaire (Patricia Leahy-Warren)

-Original Message-----

From: Leahy-Warren, Patricia [<mailto:Patricia.Leahy@ucc.ie>]

Sent: Mon 3/10/2014 11:15 AM

To: Mary C. Economou

Subject: RE: Kind Request of a Questionnaire Cyprus

Dear Mary,

Thank you for your email and your interest in using my instrument. Your research is very interesting and very pertinent to nursing and midwifery.

The name of my scale is the Perinatal Infant Care Social Support (PICSS) Scale and has been developed and references are Leahy-Warren, 2005, Leahy-Warren, McCarthy & Corcoran, 2007, 2011, 2012).

Leahy-Warren, P. McCarthy, G. Corcoran, P.; (2012) 'First Time Mothers: social support, maternal parental self-efficacy and postnatal depression'. Journal of Clinical Nursing, 21 (3-4):388-397.

Leahy-Warren, P. Corcoran, P.; (2011) 'Care from health visitors trained in psychological intervention methods may prevent depression in mothers not depressed at 6 weeks postnatally'. Evidence Based Nursing, doi:10.1136/ebn.2011.100085 . [DOI]

Leahy-Warren, P; (2007) 'Social support for first-time mothers'. MCN-The American Journal of Maternal-Child Nursing, 32 :368-374.

It has also been used and published recently in JCN by Shorey et al 2014

Please note that the theoretical underpinnings are discussed in these publications and thus there are 2 parts to the scale. One measures structural social support and the other measures functional social supports in the context of infant care practices.

I would appreciate if you could let me know if you are planning to use the scale and if so that you would be happy to share your data as I am currently doing some further work on its psychometric properties?

Acknowledgement of the above authors within publications as the developers of the instrument is as per protocol in academia.

I look forward to hearing from you

Best of luck with your research

Kind regards

Patricia

(d) WBSS Quetsionnaire (Dr Y. Bai)

From: baiy@mail.montclair.edu
Subject: Re: Kind Request of a Questionnaire
Date: Sat, 15 Feb 2014 10:09:34 -0500
To: economoum80@hotmail.com

Mary

thank your for your interest in WBSS instrument. you have my permission to use the instrument and it is attached. DR. Bai

Appendix M: Approvals necessary for the initiation of the study

(a) Cyprus National Bioethics Committee


ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΕΘΝΙΚΗ ΕΠΙΤΡΟΠΗ ΒΙΟΗΘΙΚΗΣ ΚΥΠΡΟΥ

Αρ. Φακ.: ΕΕΒΚ ΕΠ 2014.01.75
Αρ. Τηλ.: 22809038/039
Αρ. Φαξ: 22333878

18 Ιουνίου 2014

Αρ. Νικό Μιλιτσιου
Τμήμα Νοσηλευτικής
Σχολή Επιστημών Υγείας
Τεχνολογικό Πανεπιστήμιο Κύπρου

Θέμα: «Πρακτικές των μααιευτοίαν ως προς την ενσωματώ των «18 θανάτων» των WHO/Unicef για σπυτήρ θλάσας στο πλαίσιο των ερευνητικών προγράμματος «A BrEAST start in life: addressing social inequalities and supporting breastfeeding through inclusion activities»

Αναφέρομαι στην επιστολή σας ημερομηνίας 16 Ιουνίου 2014 για το πιο πάνω θέμα (μέσω ηλεκτρονικού ταχυδρομείου), και επιθυμώ να σας πληροφορήσω ότι από την μελέτη του παρρηγομένου των εγγράφων που έχει κυνώδου (κυλώσας επιστολή, προστάλλο και ερωτηματολόγος), που αφορούν την πιο πάνω έρευνα, έχω αντλήσει ότι:

1. Η έρευνα που θα διαλάγει σπυρίζεται στη διασπορά και σπύλλογ ανώνυμων ερωτηματολογίων σε μητέρες από μααιευτικές μονάδες ιδιωτικού και δημόσιου τομέα από το Παγκάριο και στο μααιευτικό /νοσηλευτικό προσωπικό των μονάδων αυτών.
2. Δεν θα υπάρξει από δας σας κλώρως οπωσδήποτε καθίσταση σε σπυμπερίστον για τη λήψη οπωσδήποτε βιολογικής σπύας για οπωσδήποτε εξέτασης, και
3. Δεν τίθεται θέμα παροχής οπωσδήποτε ιατρικής φροντίδας προς τους σπυμπερίστον.

Σύμφωνα με όλα τα πιο πάνω, έχω την άπωση ότι η εν λόγω έρευνα σας δεν χρώζει οπωσδήποτε βιολογικής αξιολόγησης από την Εθνική Επιτροπή Βιολογικής Κύπρου.

Σας ενημερώνω ότι για οπωσδήποτε κλώρως σπυμπερίστον και οπωσδήποτε σπυμπερίστον ερευνών με τα ίδια θέμα ή/και υπό εξέταση κλώρως μέσο σε σπύμπερ σπυμπερίστον χρονικό διάστημα, η ΕΕΒΚ δημοσιεύει στην ιστοσελίδα της το θέμα της έρευνας, τον φορέα και τον υπό εξέταση κλώρως.

Σας ευχόμενι κώδε σπυμπερίστον στην διαλάγηση της έρευνας σας.

Με εκτίμηση,

Αρ. Μιχάλης Παναιώτης
Πρόεδρος
Εθνική Επιτροπή Βιολογικής Κύπρου

Κέντρο Υγείας Έγκλησης, Νίκος Κρωνιδιώτης, 2411 Λεωσπία,
Ηλεκτρονικό Ταχυδρομείο: enbc@bioethics.gov.cy Ιστοσελίδα: www.bioethics.gov.cy

(b) The Research Promotion Committee of the Ministry of Health


ΚΥΤΕΡΙΑΚΗ ΔΙΕΥΚΟΝΤΙΑ
ΥΠΟΥΡΓΕΙΟ ΥΓΕΙΑΣ

Αρ. φак: 5.34.01.7.2E
Αρ. τηλ: 22803738
Αρ. φαξ: 22605529
Email: lgeorgiou@moh.gov.cy

Αρ. Πρωτοκόλλου: 0244/2014

24 Ιουλίου 2014

✓ Κυρία Μαίρη Οικονόμου
Βραγαδινού 15
Κτήριο ΖΤ3 Λαγκασός
3041 Λ/ΣΟΛ

Θέμα: Αίτημα για παροχή αδειας διεξαγωγής έρευνας

Έχω αδελφές να αναφερθώ στο αίτημα σας για παροχή αδειας διεξαγωγής της έρευνας με τίτλο «Η αυτοεκπαίδευση των μητέρων στο μετρικό θηλασμό, πρακτικές αίσιας μέχρι και τον έκτο μήνα και οι απόψεις των ιδίων και του προσωπικού των μαιευτηρίων για την εφαρμογή των δέκα βημάτων για επιτυχή θηλασμό στα μαιευτήρια της Κύπρου » που υποβλήθηκε στην γραμματεία της επιτροπής με ημερομηνία 11/07/2014 και να σας ενημερώσω ότι το αίτημα σας έχει εγκριθεί.

Νοείται, ότι θα πρέπει να προσβείτε σε ενημέρωση των προϊσταμένων των τμημάτων / υπηρεσιών για την διεξαγωγή της σχετικής έρευνας. Επισημαίνεται ότι σε καμία περίπτωση δεν θα πρέπει να διαταρασσεται η σωστή λειτουργία των τμημάτων όπου θα διεξαχθεί η έρευνα.

Παράκληση όπως σε κατωτέρω στάδιο υποβάλετε: ενδιάμεση έκθεση συμπληρώνοντας κατάλληλα το επισυνημμένο έντυπο «Παρακολούθηση Έρευνας υπό την Επιστημονική Επιτροπή Προώθησης Έρευνών» στο οποίο αναφέρεται η εξέλιξη και το στάδιο στο οποίο βρίσκεται η εργασία σας.

Επίσης, με την ολοκλήρωση της έρευνας σας θα πρέπει να παραδώσετε στην γραμματεία της επιτροπής τα ακόλουθα:

- Αντίγραφο ολοκληρωμένης έρευνας σε ηλεκτρονική και έντυπη μορφή
- γραπτή συγκατάθεση σας για την διαχείριση των αποτελεσμάτων της έρευνας από το Υπουργείο Υγείας.
- περίληψη της έρευνας σε συγκεκριμένη μορφή καθώς και τα στοιχεία επικοινωνίας σας τα οποία θα αναρρούνται στην ιστοσελίδα του Υπουργείου Υγείας.


(Ειρήνη Γεωργίου)
για Αν. Γενική Διευθύντρια
Υπουργείου Υγείας

Καν: ΠΛΥ
Αν. Διευθύντρια ΙΥ&ΥΔΥ

(c) Notification from the Commissioners of Personal Data Protection



ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ



ΓΡΑΦΕΙΟ ΕΠΙΤΡΟΠΟΥ ΠΡΟΣΤΑΣΙΑΣ
ΔΕΔΟΜΕΝΩΝ ΠΡΟΣΩΠΙΚΟΥ
ΧΑΡΑΚΤΗΡΑ

Αρ. Φακ.: 3.26.271
Αρ. Τηλ.: 22616303

14 Ιουλίου 2014

Κυρία Μαίρη Οικονόμου
Τεχνολογικό Πανεπιστήμιο Κύπρου
Βραγαδίνου 15
Κτήριο ΖΤ3
3041 Λεμεσός

Γνωστοποίηση Σύνταξης και Λειτουργίας Αρχείου/ Έναρξης Επιτεργασίας διδακτορικής έρευνας της κ. Μαίρης Οικονόμου, φοιτήτριας στο Τεχνολογικό Πανεπιστήμιο Κύπρου με τίτλο: «Η αυτοπεριοίκηση των μητέρων στο μητρικό θηλασμό, πρακτικές σίτησης μέχρι και τον έκτο μήνα και οι απόψεις των ιδίων και του προσωπικού των μαιευτηρίων για την εφαρμογή των δέκα βημάτων για επιτυχή θηλασμό στα μαιευτήρια της Κύπρου» με εθελοντική συμμετοχή με τη χρήση ανώνυμου ερωτηματολογίου.

Αναφέρομαι στη Γνωστοποίηση που υποβάλατε στο Γραφείο Επιτρόπου Προστασίας Δεδομένων Προσωπικού Χαρακτήρα με ημερομηνία 7.7.2014, που αφορά το πιο πάνω Αρχείο, και σας πληροφορώ ότι φαίνεται να είναι σύμφωνα με τις διατάξεις του άρθρου 7(1)(2) των περί Επιτεργασίας Δεδομένων Προσωπικού Χαρακτήρα (Προστασία του Ατόμου) Νόμων του 2001 μέχρι 2012 (Ν. 138(I)/2001 όπως τροποποιήθηκε με τους Ν. 37(I)/2003 και Ν. 105(I)/2012), στο εξής «ο Νόμος», και, ως εκ τούτου, έχει καταχωριστεί στο Μητρώο Αρχείων και Επιτεργασιών που τηρεί ο Επίτροπος δυνάμει των διατάξεων των άρθρων 7(4), 23(1)(γ) και 24(1)(α) του Νόμου. Το πιο πάνω Μητρώο είναι προσβάσιμο στο κοινό, σύμφωνα με το άρθρο 24(2) του Νόμου.


(Μαρία Παπαχριστοδούλου)
για Επίτροπο Προστασίας Δεδομένων
Προσωπικού Χαρακτήρα

14/7/14

Ιεράκος 1, 2ος Όροφος, 1082 ΛΕΥΚΩΣΙΑ / Τ.Θ. 23376, 1082 ΛΕΥΚΩΣΙΑ – ΚΥΠΡΟΣ, Τηλ. +357 22616456, Φαξ +357 22904566
E-mail: commissioner@dataprotection.gov.cy, Website: <http://www.dataprotection.gov.cy>