



Cyprus
University of
Technology

Faculty of Health
Sciences

Department of
Rehabilitation Sciences

Master's Thesis

**Combination of expanded Constraint-Induced Movement
Therapy (eCIMT), “SaebFlex” orthosis and self-assessment
for improving functional use of plegic hand after chronic
stroke. A single case study**

Marianna Tsiakoulia

Limassol, April 2022

CYPRUS UNIVERSITY OF TECHNOLOGY
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF REHABILITATION SCIENCES

Master's Thesis

**Combination of expanded Constraint-Induced Movement
Therapy (eCIMT), “SaebFlex” orthosis and self-assessment
for improving functional use of plegic hand after chronic
stroke. A single case study**

Marianna Tsiakoulia

Limassol, April 2022

Approval Form

Master's Thesis

Combination of expanded Constraint-Induced Movement Therapy (eCIMT), “SaeboFlex” orthosis and self-assessment for improving functional use of plegic hand after chronic stroke. A single case study

Presented by

Marianna Tsiakoulia

Supervisor: Elena Theodorou, Assistant Professor, Department of Rehabilitation Sciences, Cyprus University of Technology

Signature _____

Member of the committee: Nikos Konstantinou, Assistant Professor, Department of Rehabilitation Sciences, Cyprus University of Technology

Signature _____

Member of the committee: Name Surname and position

Signature _____

Cyprus University of Technology

Limassol, April 2022

Copyrights

Copyright© 2022 Marianna Tsiakoulia

All rights reserved.

The approval of the thesis by the Department of Rehabilitation Sciences does not imply necessarily the approval by the Department of the views of the writer.

Acknowledgements

I would like to express my gratitude to my supervisor, Dr. Elena Theodorou, for her support, guidance and encouragement during the whole process of the completion of this study. Moreover, I would like to thank my participant for her determination to improve her own arm function and for her participation in this study as without her I would not have completed it during this difficult period for conducting research.

ABSTRACT

Introduction: The expanded Constraint-Induced Movement Therapy (eCIMT) is a high-intensive program for stroke survivors with severe hemiplegia. The use of the “SaeboFlex” a dynamic custom fabricated hand orthosis also facilitates high-intensive therapy for stroke survivors with upper extremity deficits, but astonishingly, the two methods have not been combined. Since patients must actively participate in the intervention, a study combining eCIMT with the use of SaeboFlex along with the individual’s self-assessment of their performance is crucial. This will allow researchers to examine if motor recovery is facilitated, the functional use of the affected upper extremity has enhanced, the performance in activities of daily living has improved, and if the impact on the quality of life of the stroke survivor with severe hemiplegia is a positive one.

Methods: A chronic stroke survivor with severe right hemiplegia after maternal stroke participated in this study. An A₁-B-A₂ design for 5 sessions/week of eCIMT and the use of the hand orthosis SaeboFlex and the patient’s self-assessment of her performance was followed. The duration of each treatment session was 6 hours for two weeks and included shaping tasks with and without the use of SaeboFlex and task practice. To identify the effectiveness of the intervention, outcome measures were used. The results were interpreted with visual analysis and the calculation of the percentage of non-overlapping data (PND) and p-value and compared to known minimal detectable change (MDC) and minimal clinically important difference (MCID) for each outcome measure.

Results: There was a statistically significant increase in the patient’s quality of life and motor recovery of the affected upper extremity but no difference in muscle tone. There was a statistically and clinically significant improvement in the activity of the affected upper extremity.

Conclusions: The combination of eCIMT with the use of SaeboFlex and the patient’s self-assessment of their performance can facilitate motor recovery and functional use of the upper extremity even in the chronic phase, with maintenance effects at least three months following the intervention. Further research however is warranted.

Keywords: *expanded constraint-induced movement therapy, eCIMT, hand orthosis, SaeboFlex, self-assessment, upper extremity, stroke, chronic stroke survivor*