Short Communication

Medical cannabis attitudes, beliefs and knowledge among Greek-Cypriot University nursing students

Sokratis Sokratous, Meropi D.A. Mpouzika, Katerina Kaikoushi, Lenos Hatzimilidonis, Virginia Sunday Koutroubas, Maria N.K. Karanikola *

Department of Nursing, Cyprus University of Technology, Limassol, Cyprus

A B S T R A C T

Objectives: We aimed to explore the attitudes, beliefs and knowledge of nursing students about medical cannabis use in Cyprus. Special focus was given on gender differences and the year of studentship.
Design: A descriptive, cross-sectional study with internal comparisons was performed on undergraduate nursing students in Cyprus. Pearson chi-square test for group differences was employed. A total of 252 questionnaires were anonymously and voluntarily completed. Descriptive and inferential statistics were assessed.
Results: 21 % male and 79 % female were included in the sample (response rate 62.7 %). Third year student participants reported more frequent use of cannabis for all reasons - for themselves, friends and family (p < 0.05). Furthermore, they reported more positive statements on the effectiveness of medical cannabis in treating medical conditions (p < 0.05). Moreover, female students reported more frequently the necessity of incorporating medical cannabis training into academic curricula (p < 0.05).
Conclusions: Given the reported lack of knowledge, enrichment of nursing curricula with medical cannabis related courses and lectures, both theoretical and clinical/ laboratory, are proposed. The associations of attitudes with gender and years of studentship point to the need of taking these factors into consideration for relevant education and training.

1. Introduction

Cannabis was legalized for medical use in the Republic of Cyprus at the beginning of 2019.[1,2] Medical cannabis (MC) legislation focuses mainly on promoting quality of production and substance provision. Specifically, it describes licensing procedures, safety measures, and good production practices.[2] The authorized types of products are Cannabis Sativa and Cannabis Indica. The concentration of substances D-9 Tetra-hydrocannabinol (D-9-THC) and Cannabidiol (CBD) therein is not allowed to deviate more than $\pm$ 20 % from the concentration reported by the producer.[2] The authority for issuing a license to produce, process, and sale MC is the Ministry of Health.[2] MC may be available in pharmacies and as prescription only medicines.[2] The medical prescription must contain details of both the physician and the patient, and include trade name, type of pharmaceutical excipient and percentage of the content of D-9-THC and Cannabidiol, route of administration, daily dosage, and finally the total monthly quantity.[2]

Certain ambiguities arise in reference to MC use in the current

legislation, such as: 1) no mention is made of the monthly dosage allowed per patient or the specialists that are permitted to prescribe it (e. g. neurologists, oncologists, general practitioners, etc.); 2) there is no list of medical conditions for which MC is indicated; 3) the permitted forms/ types of MC (e.g. oil, dry herbal hemp, edible derivatives) are not specified; and, 4) the prescribed route of administration (e.g. oral, inhaled) is not clarified.[2] Only MC inhalation through smoking is explicitly prohibited.[2] A detailed description of the specifications of cannabis for medical use exists only for cannabis in its raw plant form.[2]

The gaps in legislation raise serious individual and public health concerns. Examples are the diversion of MC to the black market and the risk of user abuse among others.[2] Moreover, the MC topic seems to be of high importance to healthcare students and professionals in Cyprus, since they are expected to both effectively manage MC-related issues during their clinical practice and educate healthcare service consumers on MC safe use.[3] It is well established that nurses are at the frontline of these clinical tasks. Previous studies in USA-based healthcare professionals, including nurses, associate knowledge indicators on MC with

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relevant attitudes.[4] Specifically, data show that nurses have higher self-perceived knowledge and more positive attitudes towards MC than other healthcare professionals.[4] However, a lack of formal education and training, along with significant knowledge gaps on MC have also been reported among nurses and physicians.[4,5] Altogether, there is a paucity of data on the attitudes, knowledge, formal education and clinical practice guidance about MC among nursing students and professionals, both nationally and internationally.[6,7]

The aim of the present study was to explore the attitudes, beliefs and knowledge of Greek-Cypriot undergraduate nursing students towards MC. It was hypothesized, based on previous literature,[3,6,8] that these are associated with gender and the years of studentship.

2. Methods

2.1. Design, setting and participants

A descriptive cross-sectional study with internal comparisons was performed. The study population was all undergraduate nursing students of state and private universities in the Republic of Cyprus. All active nursing students were eligible to participate, independent of age, gender and nationality.

2.2. Sample and data collection

Sample size was determined to be up to 48 participants per year of study, based on the tables of Cohen to detect a moderate correlation effect, with 80 % statistical power and α = 0.05 level of statistical significance.[9] Due to low response rate in previous surveys concerning Cypriot students, questionnaires were distributed to the entire nursing population. Thus, a total of 402 questionnaires were distributed to students during November 2019 - December 2019, during lectures in all public (one) and private (three) universities of the Republic of Cyprus and 252 questionnaires were returned (response rate 62.7 %). Regarding the 150 students who did not participate, 140 were absent on the day of the survey, 8 declined participation and 2 were excluded due to missing/incomplete data.

The "Attitudes, Beliefs and Knowledge towards Medical Cannabis Questionnaire" (MCQ), developed for cross national studies on medical cannabis education in health professionals and students, was used for data collection.[10,11] Thirteen items of the MCQ assessed attitudes and beliefs towards MC/ cannabis (e.g. benefits, risks, effectiveness) (Table 1- Part B). Eighteen items assessed beliefs and knowledge about the effectiveness of MC on medical conditions (Table 2), while two items assessed beliefs and attitudes regarding MC education (Table 1- Part C). Educational training-related attitudes towards MC were assessed by 2 items with predefined answers (Table 1- Part D). One item assessed participants attitudes towards formal and informal sources of information on MC (Table 1-Part E). A section with demographic (age, gender, origin, family and employment status), educational (year of studies, academic status, expertise), personal background (religion, work experience) and cannabis/MC-related behaviors (Table 1-Part A) variables was included in the data collection instrument. The MCQ has exhibited high internal consistency (Cronbach's alpha ranging from 0.767 to 0.831)[10]; as it did in the present study (0.75 to 0.85).

The MCQ was translated and back translated independently from English to Greek by two bilingual academics. Cultural adaptation of the translated version was also performed by a group of experts (i.e. two academics, two PhD students) to ensure content and face validity.

2.3. Ethics

Each questionnaire was accompanied with a cover letter explaining the purpose and procedures of the study, while assuring willingness, anonymity and confidentiality. Following a short oral briefing about the study by the research team, the questionnaire was distributed to students during class time (e.g., lecture theatres and labs) and written consent was obtained. Each questionnaire was returned in a sealed, non-transparent envelope and was put in a collection box. No reward was given to the participants for completing the questionnaire. The study protocol was approved by the Cyprus National Bioethics Committee (Ref. No 2019.01.155).

2.4. Statistical analysis

Descriptive statistics [means, standard deviation (SD), frequencies] were assessed. Responses to ordinal variables of the MCQ were grouped into (a) agree/effective, (b) disagree/ineffective, and (c) don't know. Differences between groups were assessed according to gender and years of studentship. The Pearson Chi-square was used accordingly. The statistical software SPSS version 25.0 was used for data analysis. Significance level was set at α = 0.05.

3. Results

Among participants, 53 were male (21 %) and 199 were (79 %) female. Their mean age was 20.8 years (SD: 2.1; range: 18–42). The majority were Cypriots (N = 210, 83.3 %) while 12 (4.7 %) were Greek and 30 (11.9 %) of other nationalities. Only 2.8 % (N = 7) were married. The majority were unemployed (N = 164, 65 %). Sixty-two participants were attending the first and second year of studies, respectively, fifty participants were attending the third year of studies, while the majority (n = 78) were attending the fourth or higher year of studentship.

Third-year undergraduate student participants reported more frequent cannabis use by themselves, friends and family members (*all p < 0.05*). They, also, believed that cannabis should be legalized for recreational use more so than the rest of the student participants (p < 0.001) (Table 1). First year participants reported more frequently the need for formal education on MC laws and regulations (*p < 0.01*) (Table 1). Finally, the majority of undergraduate participants reported a lack of formal education on the MC topic (in general) (95.1 %, n = 58 [1 st year], 83.7 %, n = 41 [2nd year], 80.5 % n = 62, [3rd year], 79.1 %, n = 49 [4th year or more]); and, they confirmed the need for formal education on MC in nursing curricula (64.5 %, n = 40 [1 st year], 36.0 %, n = 18 [2nd year], 30.8 % n = 24 [3rd year], 30.6 %, n = 18, [4th year or higher]) (Table 1).

Statistically significant differences by gender are shown in Table 1. Males reported more frequent cannabis use for recreational purposes by themselves or friends compared to females (*p < 0.05*). Furthermore, female student participants reported more frequently, the need of MC training to be incorporated into their academic curricula (93.5 %, n = 186). Female participants, also, reported more frequently, the need of MC training to be incorporated into their academic curricula [(93.5 %, n = 186) vs. 83.3 %, n = 45, respectively, *p < 0.05*] and the use of informal information sources [n = 154 (77.8 %) vs. n = 30 (55.6 %), respectively, *p < 0.01*].

Third-year undergraduate student participants reported more positive views on the effectiveness of MC in the treatment of most of the medical conditions assessed (all p < 0.05). In general, 3rd year participants perceived MC to be most effective for chronic pain (83.8 %) and terminal illness (70.4 %), and less effective for HIV/AIDS (28.9 %) (Table 2). Gender differences were, also, noted in the participants' perceptions regarding the effectiveness of MC in the treatment of chronic pain, eating disorders and nausea (*p < 0.01*) (Table 2).

4. Discussion

The present study was the first, to the best of our knowledge, to describe university students attitudes, beliefs and knowledge of MC in the Republic of Cyprus. Given the relatively high response rate and census sampling, the generalizability of the findings of the present study to the entire nursing student population in Cyprus is possible. The

Table 1

Medical Cannabis Attitudes Beliefs and Knowledge among Greek-Cypriot Nursing Students: Studenship Year and Gender Status Comparison (n = 252).

	Study Year					Gender		
	First %(n)	Second %(n)	Third %(n)	Fourth or higher %(n)	p value	Female % (n)	Male %(n)	p value
Part A: Health-related behaviors linked to cannabis and medical cannabis (MC)								
Personal MC use.	3.2(2)	0.0(0)	7.8 (6)	0.0 (0)		2.5 (5)	5.6 (3)	
Personal use of cannabis for recreational purposes.	16.1 (10)	6.0(3)	26.0 (20)	9.7 (6)	**	12.6 (25)	27.8 (15)	**
Personal, any cannabis, use.	17.7 (11)	6.0 (3)	29.9 (23)	9.7 (6)	***	14.6 (29)	27.8 (15)	*
Family members who use MC.	3.2 (2)	8.0 (4)	19.2 (15)	6.5 (4)	**	9.0 (18)	13.0 (7)	NS
Family members who use cannabis for recreational purposes.	14.5 (9)	10.0 (5)	24.4 (19)	6.5 (4)	*	14.1 (28)	16.7 (9)	NS
Family members who use any cannabis.	16.1 (10)	12.0 (6)	32.1 (25)	9.7 (6)	**	18.1 (36)	20.4 (11)	NS
Friends who use MC cannabis.	8.1 (5)	18.0 (9)	21.8 (17)	6.5 (4)	*	12.6 (25)	18.5 (10)	NS
Friends who use cannabis for recreational purposes.	43.5 (27)	42.0 (21)	47.4 (37)	32.3 (20)	NS	38.2 (76)	55.6 (30)	*
Friends who use any cannabis	43.5 (27)	50.0 (25)	48.7 (38)	32.3 (20)	NS	40.2 (80)	57.4 (31)	*
Part B: Attitudes & beliefs on cannabis and medical cannabis (MC)								
I would recommend MC for patient use.	80.6 (50)	92.0 (46)	88.5 (69)	82.3 (51)	NS	87.4 (174)	79.6 (43)	NS
Physicians should recommend cannabis as a medical therapy.	71.0 (44)	86.0 (43)	85.9 (67)	85.5 (53)	NS	83.4 (166)	77.8 (42)	NS
There are significant physical health benefits using MC.	82.3 (51)	88.0 (44)	84.6 (66)	82.3 (51)	NS	85.4 (170)	79.6 (43)	NS
There are significant mental health benefits using MC.	67.7 (42)	82.0 (41)	83.3 (65)	72.6 (45)	NS	76.4 (152)	77.8 (42)	NS
Training about MC should be incorporated into health professionals' academic curricula.	88.7 (55)	98.0 (49)	91.0 (71)	88.7 (55)	NS	93.5 (186)	83.3 (45)	*
Training about MC should be incorporated into clinical practice requirements.	83.9 (52)	90.0 (45)	87/0 (67)	74.2 (46)	NS	84.8 (168)	77.8 (42)	NS
Healthcare professionals should have formal training about MC before recommending it to a patient.	95.2 (59)	98.0 (49)	93.5 (72)	90.3 (56)	NS	93.9 (186)	94.4 (51)	NS
Cannabis should be legalized for recreational use.	33.9 (21)	34.0 (17)	61.5 (48)	37.1(23)	***	42.2(84)	48.1(26)	NS
Cannabis can be addictive.	85.5 (53)	92.0 (46)	93.5 (72)	96.8 (60)	NS	91.0 (181)	96.2(51)	NS
Using cannabis poses serious physical health risks.	77.4 (48)	80.0 (40)	82.1 (64)	83.9 (52)	NS	81.9 (163)	75.9 (41)	NS
Using cannabis poses serious mental health risks.	83.9 (52)	80.0 (40)	80.8 (63)	79.0 (49)	NS	81.4 (162)	79.6 (43)	NS
Healthcare professionals who prescribe MC should have ongoing contact with their patients.	96.8 (60)	96.0 (48)	96.2 (75)	100.0(52)	NS	96.5 (192)	100.0 (54)	NS
Additional research regarding MC use should be encouraged.	91.9 (67)	92.0 (46)	96.2 (75)	98.4(61)	NS	94.0 (187)	98.1 (53)	NS
Part C: Attitudes & beliefs on medical cannabis education (MC)								
I am prepared to answer patient's questions about MC.	25.8 (16)	32.0 (16)	38.5 (30)	25.8(16)	NS	31.2 (62)	31.5 (17)	NS
Nursing students should receive formal education about MC laws and regulations.	93.5 (58)	86.0 (43)	74.4 (58)	90.3(56)	**	85.4 (170)	85.2 (46)	NS
Part D: Training on medical cannabis (MC)								
Have you received any formal education about medical marijuana?	3.3 (2)	0.0 (0)	6.5 (5)	14.5 (9)	***	6.1 (12)	7.5 (4)	NS
Yes, in class	1.6 (1)	4.1 (2)	10.4 (8)	3.2 (2)		3.6 (7)	11.3 (6)	
Yes, in clinical practice setting	0.0 (0)	12.2 (6)	2.6 (2)	3.2 (2)		4.1 (8)	3.8 (2)	
Yes, in both the class and clinical practice setting	95.1 (58)	83.7 (41)	80.5 (62)	79.1(49)		86.2 (170)	77.4 (41)	
No, % (n)								
Nursing students should receive formal education about medical marijuana	22.6 (14)	42.0 (21)	46.2 (36)	54.9(34)	**	41.2 (82)	44.4 (24)	NS
Yes, in class	11.3 (7)	20.0 (10)	16.6 (13)	9.7 (6)		13.6 (27)	16.7 (9)	
Yes, in clinical practice setting	64.5 (40)	36.0 (18)	30.8 (24)	30.6(18)		41.2 (82)	35.2 (19)	
Yes, in both the class and clinical practice setting	1.6 (1)	2.0 (1)	6.4 (5)	4.8 (3)		4.0 (8)	3.7 (2)	
No								
Part E: Sources of information about medical cannabis (MC)								
Formal sources	71.0 (44)	78.0 (39)	82.1 (64)	82.3(51)	NS	76.4 (152)	87.0 (47)	NS
Informal sources	75.8 (47)	72.0 (36)	69.2 (54)	77.0(47)	NS	77.8 (154)	55.6 (30)	**

*p < .05; **p < .01; ***p < .001; NS: Non statistically significant difference

Table 2

Beliefs and Knowledge about Cannabis (MC) Effectiveness for Treatment of Medical Conditions: Study Year and Gender Status Comparison (N = 252).

	Total sample	Studentship Year					Gender		
		First %(n)	Second %(n)	Third %(n)	Fourth or higher %(n)	p value	Female %(n)	Male %(n)	p value
Effectiveness of medical cannabis in the treatment of the following conditions	T								
Alzheimer's disease	51.4 (130)	35.5 (22)	46.0 (23)	62.8 (49)	58.1 (36)	**	50.8 (101)	53.7 (29)	NS
Arthritis	53.4 (135)	32.3 (30)	56.0 (28)	66.7 (52)	54.8 (34)	***	53.3 (106)	53.7 (29)	NS
Cachexia	50.6 (128)	38.7 (24)	48.0 (24)	60.3 (47)	53.2 (33)	NS	49.7 (99)	53.7 (29)	NS
Cancer	59.3 (150)	54.8 (34)	64.0 (32)	62.8 (49)	54.8 (34)	NS	58.3 (116)	63.0 (34)	NS
Chronic pain	83.8 (212)	79.0 (49)	90.0 (45)	85.9 (67)	80.0 (50)	NS	86.9 (173)	72.2 (39)	**
Eating disorders	38.3 (97)	29.0 (18)	30.0 (15)	52.6 (41)	35.5 (22)	*	33.7 (67)	55.6 (30)	**
Fibromyalgia	53.8 (136)	35.5 (22)	50.0 (25)	66.7 (52)	58.1 (36)	**	55.3 (110)	48.1 (26)	NS
Glaucoma	34.8 (88)	17.7 (11)	36.0 (18)	48.7 (38)	33.9 (21)	**	34.7 (69)	35.2 (19)	NS
HIV/AIDS	28.9 (73)	17.7 (11)	30.0 (15)	38.5 (30)	27.4 (17)	NS	29.1 (58)	27.8 (15)	NS
Inflammatory bowel disease	46.2 (117)	30.6 (19)	50.0 (25)	56.4 (44)	45.2 (28)	*	45.7 (91)	48.1 (26)	NS
Sleep disorders	64.8 (164)	50.0 (31)	60.0 (30)	79.5 (62)	64.5 (40)	**	62.8 (125)	72.2 (39)	NS
Mental health conditions	66.8 (169)	50.0 (31)	66.0 (33)	78.2 (61)	69.4 (43)	**	65.8 (131)	70.4 (38)	NS
Multiple sclerosis	55.6 (140)	37.7 (23)	52.0 (26)	75.6 (59)	50.0 (31)	***	55.6 (110)	55.6 (30)	NS
Nausea	40.1 (101)	26.2 (16)	28.0 (14)	53.8 (42)	45.2 (28)	**	33.8 (67)	63.0 (34)	***
Parkinson's disease	56.5 (143)	43.5 (27)	52.0 (26)	66.7 (52)	61.3 (38)	*	56.3 (112)	57.4 (31)	NS
Persistent muscle spasm	64.8 (164)	51.6 (32)	72.0 (35)	75.6 (59)	58.1 (36)	*	63.3 (126)	70.4 (38)	NS
Seizure/Epilepsy	54.9 (139)	32.3 (20)	50.0 (25)	69.2 (54)	64.5 (40)	***	54.3 (108)	57.4 (31)	NS
Terminal illness	70.4 (178)	59.7 (37)	80.0 (40)	74.4 (58)	67.7 (42)	NS	70.4 (140)	70.4 (38)	NS

*p < .05; **p < .01; ***p < .001; NS: Non statistically significant difference.

finding that 3rd year students reported more frequent personal cannabis use and positive attitudes towards MC may be explained by the fact that MC-related courses such as mental health nursing, psychopharmacology and oncology nursing are offered during the 3rd year of studies. It could be hypothesized that 3rd year students may feel more willing to express their attitudes towards cannabis, since relevant topics are openly discussed during classes. This willingness tends to be different for 4th year students who are in clinical settings and not close to MC related issues discussed. However, this finding needs to be further investigated.

In terms of the possible link between gender and MC-related attitudes and knowledge, it has been previously studied but with contradictory results.[6,12] Our results present females with more knowledge of MC benefits and more positive attitudes towards the need for formal MC education. This could be a result that they, females, achieve higher grades than males; are more engaged with the study curricula (CUT, official unpublished report); and, consequently, tend to express their opinions more freely about improvements in the curriculum. Regarding the lower frequency of cannabis use among female students, findings from a scoping review suggest that social stigma remains high among females who use cannabis thus preventing them from reporting it.[8] Nevertheless, the reported cannabis use rates do not necessarily reflect the actual ones; this constitutes an important limitation of the present study. Additional limitations include lack of triangulation with qualitative data, as well as possible underestimation of the actual frequency of cannabis use, or positive attitudes towards MC. This may be attributed to one's need to preserve a positive personal image, thus avoiding to report adverse behaviors (i.e. illegal substance use or socially unpopular attitudes).

In conclusion, consideration of gender status is warranted for education and workshop training purposes, by taking into account the rate of males/females involved. Moreover, enrichment of nursing curricula with theoretical and clinical/ laboratory courses in MC, during the 4th year of studies, is proposed. Gender and year of studentship should be also taken into account for further studies on student attitudes towards MC. Additional interventions to decrease recreational cannabis use among nursing students should be considered based on gender and year of studentship factors.

Author contributions

Maria NK Karanikola: Study design, draft preparation and interpretation of the data, project supervision, preliminary data analysis **Sokratis Sokratous:** draft preparation, preliminary data analysis and interpretation **Meropi Mpouzika:** critical review of the final manuscript **Lenos Hatzimilidonis:** writing part of the draft **Katerina Kaikoushi:** Data selection, preliminary data analysis **Virginia Kourtroubas:** writing part of the manuscript.

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