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Toward medical cannabis education in Israel

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ABSTRACT

Objectives: To assess knowledge, attitudes and beliefs regarding medical cannabis among Israeli medical, nursing, social work and other health related students as well as to outline the formation of an instrument for standardized data collection on these topics.
Methods: An invitation to participate with a link for the online survey was sent to all students pursuing a degree in medicine, nursing, social work, and other health disciplines in the Ben Gurion University of the Negev, Israel. The instrument included 32 items that measured knowledge, attitudes and beliefs regarding medical cannabis. In addition, demographic data were collected and participants were asked about the frequency of medical or recreational cannabis use.
Results: Among the 763 participants, 596 were females (78 %), and the mean age was 25.8 years. While the reported personal use of medical cannabis was minimal (1.9 %), cannabis use for recreational purposes was relatively common (54.0 %). The vast majority believed that medical cannabis holds significant health benefits but expressed concerns regarding potential risks of cannabis use. Additionally, the vast majority of students felt unprepared to answer patients' questions about medical cannabis and expressed a desire to receive more training. Several significant differences between the different academic disciplines were observed.
Conclusions: In light of current regulatory and scientific developments, it is apparent that students of health professions will need a greater level of understanding of medical cannabis than previous generations of students. This study emphasizes the ample need for more knowledge and formal education to students of health and related professions.

1. Introduction

Cannabis is the most widely used illicit substance, with about 188 million adults consuming cannabis at least once a year (3.8 % of the world's adult population).[1] At the same time, cannabis is emerging as a legal medical treatment in many countries worldwide including 35 states and 4 territories in the US.[2] In addition, adult-use of cannabis, for non-medical purposes, has been legalized in several countries including Canada and Uruguay.[3] Regardless of its use for either medical or recreational purposes, cannabis is subject to contentious debates at national and international levels among the general public, the medical and scientific community, law enforcement officials and other stakeholders.[4]

Similar to global developments, Israeli cannabis regulations have been in transition in recent years. The 1961 UN Convention on Narcotic Drugs defines cannabis as a "dangerous substance", and in Israel it is regulated under the "Dangerous Drug Act". Notwithstanding, Israel has one of the longest-running medical cannabis programs dating from the 1990s. While it began with only a few dozen patients licensed to use cannabis for medical purposes, over time it has evolved considerably; and, the current number of patients licensed to use medical cannabis is estimated to be over 80,000.[5]

Given the increased demand and the need for a sustainable program, the Israel Ministry of Health set up a designated governmental agency in 2011. The Israel Medical Cannabis Agency (IMCA) is in charge of regulating medical cannabis (MC) use by patients and its authorization by physicians, as well as regulating and authorizing the full supply chain (e.g. cultivation, manufacturing, distribution and scientific research). MC is generally approved as a last resort for several medical conditions,

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including chemotherapy-induced nausea and vomiting, cancer pain, neuropathic pain, inflammatory bowel diseases, as well as post-traumatic stress disorder and refractory epilepsy.[6] Currently, cannabis flowers and oils for medical conditions are available in various ratios of cannabidiol (CBD) and tetrahydrocannabinol (THC) at designated pharmacies across the country.

Several studies have been conducted on medical cannabis knowledge and attitudes among healthcare providers in Israel. In general, physicians have been reported to struggle with the introduction of cannabis as a medicine drawing on medical and scientific bases as well as on moralistic arguments.[7] Another study reported that most physicians were generally in favor of MC use and there was a unanimous agreement on the need for medical education.[8] Similarly, a survey of Israeli rheumatologists reported a lack of perceived knowledge about MC but acknowledged its potential in managing rheumatic disease.[9]

Several studies evidence the importance of including MC in the academic curricula of health and social-wellbeing professions.[10–13] Indeed, upon graduation, these students may have a crucial role in the implementation of MC policies and its integration into the practice. However, as far as we are aware, medical, nursing, social work and other health related students in the country receive no formal education related to medical cannabis. To address this situation, the Ben Gurion University of the Negev (BGU) Regional Alcohol and Drug Abuse Research (RADAR) Center initiated an effort to assess knowledge, attitudes and beliefs regarding MC among medical, nursing, social work and other health profession students. This paper outlines the efforts of the BGU-RADAR Center in creating an instrument for standardized data collection on this topic and establishing an international multi-disciplinary coalition to examine cannabis education in medical, nursing, social work and other health academic settings.

1.1. The RADAR Center experience and international efforts

The BGU–RADAR Center has significant experience addressing substance use issues through education, training, research, publication and networking with national, regional and international experts and organizations. Approved by the U. S. Substance Abuse and Mental Health Services Administration, the RADAR Center has additionally received recognition from the US National Institute on Drug Abuse (NIDA) for its "contributions to scientific diplomacy through outstanding efforts in international collaborative research on drug abuse and addiction".[14]

During a symposium of the RADAR Center and the University of Colorado, Anschutz Medical Campus (CU), medical cannabis education became a focal point.[15] Drawing on CU research of medical students' attitudes and beliefs about cannabis,[16] the RADAR Center prepared an instrument for universal data collection, as detailed below. Aiming to generate a coherent body of useable knowledge, RADAR Center has partnered with academic personnel who have used the uniform instrument in different countries. This coalition building was a long process that involved communication, cooperation and coordination among multiple partners from diverse cultural contexts, with a shared vision to promote the health and well-being of people with medical conditions.

2. Methods

The BGU Institutional Review Board approved this study about medical cannabis knowledge, attitudes and beliefs among students of the Faculty of Health Sciences and the Faculty of Humanities and Social Sciences.

2.1. Participants and materials

An invitation to participate in this study with a link for the online survey (in Qualtrics software platform) was sent to all students pursuing a degree in medicine, nursing, social work and other health professions. The invitation emails included details about the study, its aims, and assurance of confidentiality and compliance with all ethical standards. A total of 763 students completed the questionnaire.

The 32-item questionnaire, prepared by RADAR Center measured knowledge, attitudes and beliefs regarding medical (and non-medical) cannabis. The following demographic measurements were included: age, gender, religion, religiosity level, civil and occupational status, education level, and work experience). Furthermore, participants were asked about the frequency of medical or recreational use of cannabis (from "never" to "daily") and were asked if any of their friends or family members have used cannabis for either medical or recreational purposes (optional answers: "yes" or "no").

2.1.1. Attitudes and beliefs

Ten items assessed different attitudes toward medical cannabis, such as "using cannabis poses serious mental health risks" and "physicians should recommend cannabis as a medical treatment". Participants were asked to indicate their level of agreement to these statements on a 6-point Likert scale ("strongly disagree" to "strongly agree"). In order to facilitate binomial comparisons, answers were collapsed into two categorical variables, namely "agree" and "disagree".

2.1.2. Perceived efficacy of cannabis

A list of 18 medical conditions was presented, and participants were asked to rate the perceived efficacy of cannabis for each of these conditions on a 6-point Likert scale ("very effective" to "very ineffective"). This list is a collection of conditions identified as having scientific and/or regulatory acceptance as qualifying conditions for medical cannabis use, including nausea, chronic pain, insomnia and inflammatory bowel disease. To facilitate binomial comparisons, answers were collapsed into two categorical variables, namely "effective" and "ineffective".

2.1.3. Knowledge and training

Participants were asked to indicate whether they feel prepared to answer patients' questions on medical cannabis, and if they believe students in their professional field should get formal education on this topic. In addition, participants were asked if they ever received formal education about medical cannabis either in class or a clinical practice setting, if they believe that training on cannabis should be included in academic curricula and field practice requirements, and if such training ought to be compulsory to any professional who recommends medical cannabis to patients.

Participants were asked which sources of information they used to know about medical cannabis. Answers were collapsed into a dichotomous variable of formal sources (medical literature, classroom lectures, clinical setting, physicians and university policy) versus informal sources (experience with patients, other students, friends or family use of medical or recreational cannabis, personal use and dispensary personnel).

2.2. Statistical analysis

For descriptive statistics, means and standard deviations were calculated for continuous variables and frequencies and percentages for categorical ones. Chi-square tests of independence were additionally used to compare between male and female respondents and between the different professional disciplines. The Statistical Package for the Social Sciences (SPSS) version 26 was used for data analysis.

3. Results

As shown in Table 1, which summarizes the sample characteristics, among the 763 respondents, 596 were females (78 %), and the mean age was 25.8 years (range 19–53; SD = 3.6). The sample included students from medicine (21.3 %, n = 187), nursing (24.9 %, n = 190), social work (24.5 %, n = 187), and other health professions including gerontology, emergency medical services, physical therapy and pharmacology (29.2

Table 1
Sample characteristics.

	Female (n = 596)	Male (n = 167)	Total (n = 763)
Age, mean (SD)	25.8 (3.7)	25.9 (3.2)	25.8 (3.6)
Discipline, % (n)			
Medicine	16.1 (96)	40.1 (67)	21.3 (163)
Nursing	27.9 (166)	14.4 (24)	24.9 (190)
Social work	28.8 (172)	9.0 (15)	24.5 (187)
Other	27.2 (162)	36.5 (61)	29.2 (223)
Religious preference, % (n)			
Jewish	92.1 (545)	90.4 (150)	91.7 (695)
Muslim	4.6 (27)	5.4 (9)	4.7 (36)
Christian	0.8 (5)	0.6 (1)	0.8 (6)
Other	2.5 (15)	3.6 (6)	2.8 (21)
Religiosity, % (n)			
Secular	69.9 (414)	70.5 (117)	70.1 (531)
Non secular	30.1 (178)	29.5 (49)	29.9 (227)
Cannabis Use, % (n)			
Personal – medical	1.5 (8)	3.0 (5)	1.9 (14)
Personal – recreational ***	50.4 (297)	66.7 (110)	54.0 (407)
Family member – medical	31.6 (187)	29.5 (49)	31.2 (236)
Family member – recreational	42.2 (249)	41.0 (68)	41.9 (317)
Friend(s) – medical *	41.5 (244)	50.0 (84)	43.5 (328)
Friend(s) – recreational	73.3 (432)	79.4 (131)	74.7 (563)

* $p < 0.5$.
*** $p < 0.01$.

%, n = 223). While the reported personal use of medical cannabis was minimal (1.9 %, n = 14), the personal use of cannabis for recreational purposes was relatively common in our sample (54.0 %, n = 407). In addition, more than half of participants reported having family member (s) who use either medical or recreational cannabis (31.2 % and 41.9 %, respectively), and the majority reported that their friends were using either medical or recreational cannabis (43.5% % and 74.7 %, respectively).

Respondents revealed an overall support for medical cannabis, as indicated in Table 2 which presents their attitudes toward the substance . Thus, the vast majority of the sample believed that medical cannabis holds significant health benefits, both physical (91.5 %, n = 691) and mental (85.3 %, n = 643). Nonetheless, respondents also expressed concerns regarding potential risks of cannabis use, believed it can be addictive (84.2 %, n = 634), and that its use can pose serious risks for physical (51.7 %, n = 390) and mental health (62.4 %, n = 471). The vast majority of respondents believed that medical, nursing, social work and other professionals should have formal training about medical cannabis prior to recommending it to patients (98.7 %, n = 741) and that additional research regarding medical cannabis use should be encouraged (98.5 %, n = 739).

As shown in Table 2, results show several significant differences between the disciplines. For example, a lower proportion of medical students agreed that using medical cannabis may be associated with either physical or mental health benefits. Medical students were additionally less inclined to agree that "physicians should recommend medical cannabis as a medical therapy". While 94.7 % of nursing students agreed that training about medical cannabis should be incorporated into academic curricula, students from other disciplines were less inclined to agree. A higher proportion of social work students (90.8 %) agreed that cannabis can be addictive. Fig. 1 presents respondents' perceived efficacy of cannabis for different medical indications. The conditions for which cannabis was perceived as most effective were chronic pain (96%), followed by cancer (83%) and arthritis (76%).

Study results evidence considerable demand for medical cannabis training from students. Among the respondents, 90.6 % noted they received no formal education on medical cannabis (n = 678), and only 15.4 % (n = 115) felt prepared to answer patient or client questions about its use for medical conditions. The vast majority of students expressed a desire to receive medical cannabis use training and believed

Table 2
Attitudes towards Medical Cannabis.

Attitude statement, % (n)	Medicine (n = 163)	Nursing (n = 190)	Social Work (n = 187)	Other (n = 223)	Total (n = 763)
I would recommend medical cannabis for patient/client use*	89.6 (146)	93.2 (177)	84.9 (158)	85.4 (187)	88.1 (668)
Physicians should recommend cannabis as a medical therapy *	88.8 (143)	95.8 (181)	94.1 (174)	89.8 (194)	92.1 (692)
There are significant physical health benefits using medical cannabis**	85.2 (138)	96.8 (183)	91.9 (171)	91.3 (199)	91.5 (691)
There are significant mental health benefits using medical cannabis**	77.8 (126)	88.9 (168)	89.1 (164)	84.5 (185)	85.3 (643)
Training about medical cannabis should be incorporated into medical/health/social wellbeing related academic curricula***	89.5 (145)	94.7 (177)	79.6 (148)	90.4 (197)	88.6 (667)
Training about medical cannabis should be incorporated into residency/field practice requirements	93.3 (152)	95.7 (180)	96.2 (179)	91.8 (201)	94.2 (712)
Medical/health/social wellbeing related professionals should have formal training about medical cannabis before recommending it to a patient/client	98.1 (158)	99.5 (185)	99.5 (185)	97.7 (21.3)	98.7 (741)
Cannabis should be legalized for recreational use	63.2 (103)	55.3 (105)	65.4 (121)	53.9 (118)	59.0 (447)
Cannabis can be addictive**	87.6 (141)	82.1 (156)	90.8 (168)	77.9 (169)	84.2 (634)
Using cannabis poses serious physical health risks	52.8 (85)	50.0 (95)	55.4 (103)	49.1 (107)	51.7 (390)
Using cannabis poses serious mental health risks	65.8 (106)	61.6 (117)	67.2 (125)	56.4 (123)	62.4 (471)
Medical professionals who prescribe medical cannabis should have ongoing contact with their patients/clients	95.0 (152)	94.7 (179)	90.9 (169)	94.5 (207)	93.8 (707)
Additional research regarding medical cannabis use should be encouraged	99.4 (159)	97.3 (181)	98.9 (184)	98.6 (215)	98.5 (739)

* $p < 0.5$.
** $p < 0.1$.
*** $p < 0.01$.

that students in their professional field should also receive formal education regarding medical cannabis laws and regulations (83.0 %; n = 620). Indeed, as mentioned above, almost all study participants (98.7 %; n = 741) believed that professionals should receive formal training about medical cannabis before recommending it to a patient or client (see Table 3).

Results show significant differences based on medical, nursing, social work and other health disciplines. A higher proportion of medical

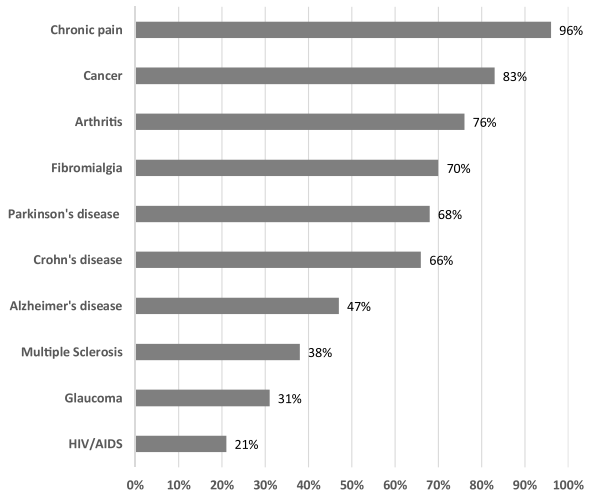

Fig. 1. Respondents' perceived efficacy of cannabis for different medical indications.

Table 3
Education and Training.

Education and Training Statement, % (n)	Medicine (n = 163)	Nursing (n = 190)	Social Work (n = 187)	Other (n = 223)	Total (n = 763)
Have you received any formal education about medical cannabis? **					
Yes, in class	12.7 (20)	6.8 (13)	1.1 (2)	7.8 (17)	7.0 (52)
Yes, in clinical practice setting	0.0 (0)	2.1 (4)	1.6 (3)	1.8 (4)	1.5 (11)
Yes, in both the class and clinical practice setting	0.6 (1)	1.6 (3)	0.5 (1)	0.9 (2)	0.9 (7)
No	86.6 (136)	89.5 (170)	96.7 (178)	89.4 (194)	90.6 (678)
Should students in your professional field receive formal education about medical cannabis? ***					
Yes, in class	34.8 (55)	43.4 (82)	23.4 (43)	36.9 (80)	34.8 (260)
Yes, in clinical practice setting	12.0 (19)	10.1 (19)	20.7 (38)	13.8 (30)	14.2 (106)
Yes, in both the class and clinical practice setting	48.7 (77)	44.4 (84)	40.2 (74)	38.7 (84)	42.6 (319)
No	4.4 (7)	2.1 (4)	15.8 (29)	10.6 (23)	8.4 (63)
I am prepared to answer patient/client questions about medical cannabis*	12.5 (20)	19.7 (37)	10.3 (19)	18.1 (39)	15.4 (115)
Students in my professional field should receive formal education about medical cannabis laws and regulations***	91.9 (147)	89.9 (169)	71.9 (133)	79.9 (171)	83.0 (620)

* $p < 0.5$.
** $p < 0.1$.
*** $p < 0.01$.

students reported having received formal education about medical cannabis in class. In addition, social work students were less inclined to agree that students in their professional field should receive such education. The reported preparedness to answer patient/client questions about medical cannabis was significantly lower among social work (10.3 %) and medical (12.5 %) students compared to those from nursing (19.7 %) and other health disciplines (18.1 %).

4. Discussion

The role of cannabis and cannabis-based pharmaceuticals in modern medicine is a topic of a growing interest and contentious controversy.[4] While cannabis has been used for therapeutic purposes for thousands of years, medical and allied health personnel are still faced with multiple areas of concern and uncertainty regarding the rational use of MC.[7] Nonetheless, increasing public interest and advocacy in support of MC is causing the issue to be considered more frequently by medical, nursing, social work and other health professionals.[17,18],

As the number of patients being treated with MC continues to rise, it is likely that medical, nursing, social work and other health professionals will encounter more patients who are either interested in cannabis treatment or are already being treated with MC. This makes it vital for such professionals to be knowledgeable about the effects and outcomes of MC treatments.[19] Hence, this study aimed to explore MC knowledge, attitudes, and beliefs among Israeli medical, nursing, social work and other health profession students. We found a relatively high level of support for MC, as most respondents believed cannabis might hold therapeutic value for physical and mental health conditions.

These findings are consistent with previous studies that reported high levels of support and openness to consider cannabis as a therapeutic intervention, both in Israel and elsewhere.[8,9,20,21] The relatively high support and concurrent concerns about potential harms are in line with previous studies that surveyed medical and health students.[16] Notably, more than half of our sample (59 %) supported cannabis legalization for recreational use. This may be partially related to the fact that Israeli media is widely advocating for the benefits of cannabis, and such reports may increase favorable perceptions of its use.[22,23] In addition, participants reported relatively high rates of cannabis use, for medical or recreational use, by themselves and/or by their friends and family. People who are cannabis users or know cannabis users personally may hold more favorable or permissive beliefs about the substance.

Another prominent finding is the need for more education and training on medical cannabis. The substantial support for the inclusion of MC in academic curricula and clinical training is consistent with previous studies from Israel and elsewhere.[24–26] With the growing prevalence of medical cannabis use in the country with the growing prevalence of medical cannabis in the country, education and training needs should be assessed on a national level in order to guide adequate educational efforts. The integration of MC into medical and allied health professional training may offset the bipolar consideration of cannabis as both a therapeutic agent and a substance of abuse and partially settle the controversy and conundrum on this emerging field of medical care.

This study is limited by its cross-sectional design and the number of respondents. The non-representative data were collected only in one university in Israel, and any extrapolation should be considered with caution. Also, there is a potential for selection bias so that students who have chosen to participate in the study are possibly holding more favorable attitudes. However, while there was a relatively high proportion of participants who reported cannabis use (54 %), the Israeli Anti-Drug Agency's official data from 2017 reported that 51.9 % of adults aged 18–40 in Israel have ever used cannabis.[27] An additional limitation of this study is instrument validity. Future studies are warranted to use comprehensive psychometric analyses such as confirmatory factor analysis, test of divergent and convergent validity. Nevertheless, this study brings novel insights from a relatively large sample of a diverse student population and contributes to the growing body of knowledge about medical cannabis education.

In conclusion, this study emphasizes the ample need for more knowledge and formal education to students of health professions. In light of current regulatory and scientific developments, it is apparent that students of medicine, nursing, social work and other health professions will need a greater level of understanding of cannabis-related issues than previous generations of students. The findings also support the need for more studies in this field linked to integrating this topic into

academic curricula.

Declaration of Competing Interest

The authors report no declarations of interest.

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