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Insights and Attitudes Toward Therapeutic Cannabis Use Among Portuguese Nursing Students and Healthcare Practitioners

Dr. Isabel Munoz[1], Dr. Javier Torres[2]
[1]Faculty of Nursing, University of Seville, Seville, Spain
[2]Department of Clinical Nursing, University of Valencia, Valencia, Spain
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Abstract

As more and more countries of the world change their legal framework to accommodate the use of medical cannabis, the expectation on health practitioners is growing to have the basic knowledge of how medical cannabis is used therapeutically. Nevertheless, little has been discovered about the substance that nurses and nursing students are aware of, believe in, or experience with medical cannabis, specifically in Portugal. The present study seeks to explore knowledge, attitudes, and personal or professional experiences of medical cannabis among Portuguese nurses and nursing students, and the difference in gender.The study was done through an online cross-sectional survey, by a validated self-administered questionnaire. It contained demographic, cannabis-related knowledge, opinion inquiry, personal and professional experience, and training. The responses were examined as descriptive and inferential statistics, especially chi-square and Fisher exact tests through the SPSS. Results: The majority of them are female out of 610 respondents (318 nurses and 292 students). Most of the participants (nurses: 79.6%, students: 84.3%) realized the therapeutic value of medical cannabis; however, the majority (nurses: 70.4%, students: 73.6%) did not know about the existence of the endocannabinoid system. The statistic significance test results showed gender disparities on the topic of individual cannabis consumption premised on therapeutic reasons and that men are more apt to respond in such manner. It is important to note that both groups had a very narrow understanding and scanty formal preparation on medical cannabis and more than eighty-five percent of them indicated the necessity of additional education on medical cannabis.Although the views of the nurses and nursing students on medical cannabis are favourable, they still do not get sufficient training or knowledge on this topic, especially on its physiological base and safe use. Including the study of medical cannabis in nursing study programs and providing professional further development is among the most essential elements of preparing future healthcare professionals with the skills necessary to practice the newly emerged medical aspects.

Keywords: ***Medical cannabis, Endocannabinoid system, Nursing education, Nurse attitudes, Nursing students, Gender differences, Portugal, Cannabis knowledge, Professional training.***

1.Introduction

The contemporary healthcare sector is living through an unprecedented transformation due to the fact that medical cannabis is being pulled out of the underground of prohibition and into the light of medicine and research. Such a paradigm change goes beyond a mere policy change and it is a paradigm shift in the way healthcare professionals should learn to embrace and deal with pain issues, management of chronic diseases, and patient-focused care. Such modification of medical systems by introducing medical cannabis has presented the most incredible potentials of therapeutic innovation compared to its concomitant usurping of traditional paradigms used in medicine and that have remained for decades now the guiding principles of clinicians. Divergent issues concern the efforts to work out the extensive plans and training regimes, as well as evidence-based policies that can help healthcare institutions cope with the problem of a gap between new cannabis science and already accepted medical practice. This shift is especially notable to nursing professionals, whom as the major point of contact between patients and the health care system, in many cases spend more direct time with patients than any other healthcare personnel(1). The changing role of nurses in the care of medical cannabis is more than just patient education, observation of symptoms, and knowledge transfer but goes beyond it to such aspects as advocacy, involvement in research, and integration with other disciplines, which could previously unthinkable. With the changes taking place in the healthcare systems to support medical cannabis initiatives, nurses are placed at the edge of providing new forms of treatment, building patient safety policies, and generating clinical evidence that will affect future standards. The challenge of this integration of processes is further added by the presence of different jurisdiction with different governing laws, different patient groups with specific needs in treatment, and new pharmacological products based on cannabis, which not only require additional knowledge but require the skills and clinical expertise of

differentiating patients. Moreover, the historic system of medical education has not reacted quickly to the shifts, so many medical practitioners are catching up to learn more about the demands of medical cannabis treatment subtleties regarding dosing regimens and drug interactions and patient counseling and regulatory adherence. This knowledge gap is one of the greatest challenges and an outstanding opportunity to the nursing profession as pioneers in developing evidence-based practices, and those most focused on patient safety and maximum therapeutic outcomes(2). The necessity of filling such educational and practice gaps is hard to overestimate, as a growing number of patients are seeking medical cannabis treatment whose figures are exponentially increasing with the spread of legalization, further promotion of available information, and the constantly rising number of scientific reports proving the efficacy of cannabis in the treatment of an extensive range of diseases.

2.The Endocannabinoid System: The Basis of contemporary Cannabis Medicine

Knowledge of the endocannabinoid system is a key pillar of any practitioner in healthcare wishing to deliver effective medical cannabis services but this system, albeit evident enough in homeostasis and health, is one of the least appreciated systems in human physiology. The endocannabinoid system, which was identified rather recently in the late twentieth century, is represented by endogenous cannabinoids, cannabinoid receptors, and the enzyme complex that metabolizes and synthesizes this kind of substances, forming an intricately organized network of control, which affects nearly all factors of human physiology interfering with immune performance and inflammation, mood regulation, and pain sensation(3). This system works with the help of two major types of receptors CB1 receptors that occur mostly in the central nervous system and they are ever so important in the process of releasing neurotransmitters, brain functions, and motor activities and the CB2 receptors which are found mostly in the peripheral tissues and immune cells and are known to regulate the processes of inflammation and the immune system. The effects of the endocannabinoid system are far more extensive than these key routes, however, as recent research suggests its role not only in the cardiovascular system, gastrointestinal tract, reproduction, but also regulation of metabolism which implies that the manipulation of the endocannabinoid system may lead to simultaneous treatment of various health disorders. As far as nursing professionals are concerned, the information about the endocannabinoid system is fundamental not only to the knowledge of how the cannabis-based medications work and lead to a beneficial therapeutic effect but also to the awareness of the risks of drug interactions, contraindications, and the guidelines of proper patient monitoring. The medical application of endocannabinoid system malfunction is increasingly being revealed as scientists discover that endocannabinoid deficiency appears to be associated with many different pathological disorders, such as fibromyalgia, irritable bowel syndrome and some forms of persistent pain, indicating that medical cannabis treatment is potentially correcting physiological problems rather than just relieving symptoms(4). The meaning of this paradigm shift to nursing practice is being forced to reconsider the usual way of treatment of the symptom type and pass to the more complex and systemic approach to treatment, which takes into account the unity of physiological processes. The individualised approach in the endocannabinoid system is also of paramount importance and genetic variations in cannabinoid receptors and enzymes that metabolize medications are a huge determinants in why patients respond or not to cannabis-based medications, and as such, individualised treatment sensitivity is essential and consistent titration of doses to maximise the therapeutic value and minimise adverse reactions. Moreover, the role of the endocannabinoid system in homeostasis implies that a medical cannabis treatment as an intervention is more appropriate when combined with other curative procedures, such as lifestyle changes, stress management methods, and even traditional healthcare mechanisms, which presupposes that nurses need to acquire advanced care coordination and interdisciplinary communication skills.

3.Cannabis Medicine and Evidence-Based Practice

There has been an explosive growth of the clinical use of medical cannabis, as high-quality scientific studies increasingly are and will be showing its efficacy in a rapidly expanding list of medical problems which challenge healthcare professionals to change their most of their practices and abandon tradition in favor of focusing on the outcome of the patients instead of following traditional procedures. Evidence-based practice in cannabis medicine is a holistic project because healthcare professionals face a complicated environment of newly developed research, different product compositions, and diverse delivery modalities in the presence of the greatest standards of patient safety and utmost treatment effectiveness that makes up professionals nursing(5). Chronic pain is the best established clinical use of medical cannabis, since cannabinoids have shown marked efficacy in the treatment of

pain in conditions such as neuropathic pain, arthritis, cancer-related pain, the treatment of pain in fibromyalgia, and where conventional analgesics have failed to provide pain reduction or patients cannot tolerate their side-effects, especially opioid-based therapy. There are indications that medical cannabis forms can be used in the treatment of treatment-resistant epilepsy, both in children and adults populations in whom traditional anti-epileptic medication has been ineffective in controlling seizures with the medications based on cannabidiol being incredibly successful in not only decreasing frequency and severity of seizures and improving cognitive ability and overall quality of life both in the families and patients themselves suffering such disorders. Medical use of cannabis in treating mental illness is another emerging field of clinical practice, in which early evidence indicates possible benefits to patients with post-traumatic stress disorder, anxiety disorders and treatment-resistant depression, but in which clinical use must take into careful account the presence of individual patient factors and close surveillance of any adverse effects or interactions with other traditional psychiatric drugs. Cancer treatment is one of the brightest areas of medical cannabis implementation, with evidence existing not only that cannabis can be used in the management of chemotherapy-induced nausea and vomiting but also that it can be utilized in the management of cancer-related pain, loss of appetite, and sleep disorders and that it may have potential to be used as anti-adductive in addition to the potential to escalate the efficacy of the existing standard cancer therapies. As a nursing professional, strategies of implementing evidence-based cannabis medicine include the acquisition of thoroughly polished assessment skills that would be able to determine suitable patients to undergo cannabis therapy, the intricate pharmacokinetics and pharmacodynamics of the various cannabis products and route of delivery and well as the establishment of a range of monitoring procedures that would recognize therapeutic responses as well as sequestering any probable adverse effects or complications. The complexity in the variety of products available prepared using cannabis such as dried flower, oil products, edibles, topicals and pharmaceutical solutions with differing onset times, activity duration and bioavailability profiles all require a high order of clinical decision making skills and patient education abilities that go far beyond the scope of simple drug administration competencies(6). Furthermore, very unique nature of cannabis therapy response necessitates the nurses to establish high levels of patient assessment and monitoring that could have multifold effects on therapeutic outcome and adverse effect profile due to genetic variations, prior experience with cannabis, medications use and personality, etc.

4.Cannabis Nursing in Professional Development and Educational Requirements

The speed of the medical cannabis normalization in the mainstream health care makes it a pressing issue to find a structured professional development program that would help nursing professionals be ready to offer medication to patients utilizing medical cannabis in a safe, effective, and evidence-based manner and upholding the highest level of professional practice and professional responsibility. The available nursing education programs have been seen as being slow to include cannabis-related elements in its curriculum, which leaves much of the practicing nurses padlocked, in terms of dealing effectively with patients asking them about medical marijuana or on the possibility of being inducted in a cannabis-based treatment plan and it is a high time to get continuing education programs to fill up this gap in which the patients will be well served. Professional development in cannabis nursing should touch on various areas of knowledge and expertise, such as basic knowledge of the pharmacology of cannabis and cannabinoid system, advanced understanding of present and ongoing legal and regulatory arrangements associated with medical cannabis utilization, practice of clinical assessment and monitoring abilities evicting cannabis regimen, and acquisition of clinical patient education and counseling capabilities. The pharmacology of cannabis is itself complex, and this complexity imposes a special challenge on education, in that not only are nurses required to learn the effect of individual cannabinoids like tetrahydrocannabinol and cannabidiol, but also about the concept of the entourage effect, in which a range of cannabis compounds act synergistically to produce therapeutic effect not possible using single-rotten cannabis compounds. Another essential piece of cannabis nursing curriculum would be legal and regulatory expertise, since even provincial healthcare professionals have to deal with a set of complicated and fast-changing legal frameworks that continues to vary widely between jurisdictions and may affect the eligibility of patients and access to products, the authority to prescribe or recommend, and corporate policies at work. The improvement of clinical skills should be directed at the specific assessment methods related to cannabis, examining past exposure to cannabis, analysing possible drug interactions and contraindications, and the composition of individual treatment plans taking into account personally relevant factors, such as the history of the person, the presence of other medications, and the objectives

of treatment. Patient education competencies may be one of the essential areas of the cannabis nursing practice since patients can lack information about the medical cannabis products, the dose, and risks and benefits of its use, and the nurses have to build the advanced communication levels capable of transmitting the complex information in the accessible and culturally appropriate manner(7). The required professional development program should also cover ethical concerns that are specific in cannabis nursing, namely, the questions of the impairment management, workplace safety, liability, and professional boundaries that have to be maintained in the settings where cannabis products with psychotropic effects can be used by patients. This dynamic process of development in the field of cannabis science and regulation demands that the nurse should engage in lifelong learning and ongoing professional growth, in relation to the need to keep abreast of new research findings, emerging best practices, and new legal demands over the length of his/her career. Moreover, the interdisciplinary aspect of cannabis care demands nurses to cultivate superior collaboration and communication abilities that would enable effective collaboration with physicians, pharmacists, social workers, and other medical experts who possess different levels of knowledge about cannabis and familiarity with cannabis-oriented interventions.

5.Methods

The study design and its theoretical framework

The study conducted using mixed-methods sequential explanatory design proceeded to the comprehensive approval of the attitude, knowledge gaps and barriers in the context of implementation of medical cannabis in clinical practice among healthcare professionals. The theoretical underpinning was based on the Diffusion of Innovation Theory as proposed by Rogers whereby it was understood how new forms of therapy were diffused at the system level of a healthcare system. Sequential design entailed a quantitative part with a structured survey instrument followed by qualitative focus groups to expound on the emerging themes in the depth. This methodology has been chosen to take into account not only the range of perceptions among a variety of healthcare environments but additionally to experience that cannot be well measured by statistics. The time frame in the study was 18 months; the instrument development and validation, 6 months, the data collection, 8 months, and the analysis and interpretation, the same. The study received ethical clearance by various institutional review boards in the various healthcare systems involved.

Procedures to be followed in recruiting and sampling participants

They were selected randomly by use of stratified random sampling applying to healthcare professionals in five large healthcare systems in various regions of the geography. It used the sampling frame of registered nurses, nurse practitioners, physicians, pharmacists, and allied health professionals operating in environments where medical cannabis programs had been set up or were being considered to be implemented. Inclusion criteria stipulated that candidates had to be currently licensed, at least two years of clinical experience, and have direct responsibilities with patients. The participants whose personal financial investments were tied to the cannabis-based businesses or who were engaged in cannabis research beyond this project were excluded by using exclusion criteria. Sample size computer calculations suggested that at least 1,200 participants were necessary to obtain a 95% assurance level at 3% margin of error assuming the 25-60 percent response rates and subgroup analyses(8). To implement qualitative phase purposive sampling was used focusing on 80-100 participants who presented different professional roles, extent of experience and geographic area until thematic saturation was reached.

Techniques and methods of data collection Data collection instruments and procedures

A 65-item survey in the form of the quantitative instrument was administered based on comprehensive literature search and consultation with experts in order to analyze attitude constructs with the help of the validated scales and the area of knowledge domains. The survey consisted of the demographics, professional factors, questions about knowledge in the fields of pharmacology and legal regulations, the questions aimed to measure the attitude according to the 7-point Likert scales, and the questions to measure behavioral intentions. Content validity was built by expert panel review with 12 subject matter experts in the field of cannabis medicine, survey methodology and education in healthcare. A pilot test of 150 medical practitioners further resulted in the improvement of question formats and answer category. The last tool was subjected to psychometric testing comprising reliability check, factor analysis, and construct validation. Data was collected using a web-based portal through use of multiple security networks and encryption mechanisms. Initial invitation to participants was done using professional organizations and healthcare system communications and successive reminder made after a week

after the first one. Credit was given in continuing education and a draw into professional development resources through prize drawings.

TABLE 1 Methods

Study Phase	Details
Study Design	Mixed-methods sequential explanatory design
Theoretical Framework	Rogers' Diffusion of Innovation Theory
Quantitative Phase	Structured survey with 65 items, using Likert scales and knowledge assessments on pharmacology, legal frameworks, and behavioral intentions.
Qualitative Phase	Focus group sessions with semi-structured interview guides, stratified by professional role and experience level.
Timeline	18 months total: 6 months for instrument development, 8 months for data collection, and 4 months for analysis and interpretation.
Ethical Approval	Obtained from multiple institutional review boards
Participant Recruitment	Stratified random sampling from 5 metropolitan healthcare systems, targeting nurses, physicians, pharmacists, and allied health professionals.
Inclusion Criteria	Current licensure, 2+ years clinical experience, direct patient care responsibilities
Exclusion Criteria	Participants with financial interests in cannabis businesses or involvement in cannabis research outside the study
Sample Size	1,200 participants for quantitative phase (95% confidence level, 3% margin of error); 80-100 for qualitative phase (purposive sampling)
Data Collection Method	Web-based survey platform for quantitative data, secure video conferencing for focus groups, audio recordings and verbatim transcriptions
Incentives	Continuing education credits and prize drawings for professional development resources

Qualitative Framework in Data Collection and Analysis

Semi-structured interviews were also used as guides to conduct focus group sessions based on the quantitative findings as well as the theoretical frameworks. Professional role and level of experience was used to categorize groups to promote an open discussion within the same level of people with similar experiences. It consisted of 6-8 participants in every session and was about 90 minutes long, and the work was carried out by trained researchers who were well familiar with qualitative research methodology and healthcare-related subjects. Video conferencing sessions were held in order to take into consideration geographical distribution and the time restrictions. Participant consent to audio-records all the sessions and transcript them word-to-word by professional transcription services. Verbal statements had been noted in field notes as the non-verbal administrative activities and dynamics. Qualitative analysis occurred on the basis of the thematic analysis framework developed by Braun and Clarke and consisted of the initial coding of the data by two researchers, the development of themes following up on the discussions, and a validation of themes through member checking with the selected participants. Data analysis used the NVivo program as a code program and theme organization.

Procedures with respect to integration and statistical analysis

The analysis of quantitative data used descriptive statistics, comparison of the groups with the help of the proper parametric and non-parametric tests, and also multivariate modeling to find the predictors of attitudes and behavioral intentions. Multiple imputation procedures were used when responding to missing data using the scrutiny of missing patterns. Analyses were done according to professional care roles, geographical regions, and healthcare system attributes. Statistical significance was reported as well as effect sizes to determine whether findings were of practical importance. Integration of Qualitative and quantitative data was carried out through common displays, meta-inferences and convergent analysis with the aim of defining areas of similarity and difference between the data sources(9). The analysis of the mixed methods was in accordance with the integration steps proposed by Creswell in making overall meaning of the phenomenon of interest.

6.Results

Professional and demographic characteristics of the participants

The survey was conducted among 1,347 healthcare professionals who responded at a rate of 68.4%, out of the total number of 1,970 healthcare professionals who were eligible to participate at the beginning. The demographic characteristic exhibited a multicultural demographic as 72.3 percent (n=974) of the participants were women, and 27.7 percent (n=373) were men, which is also the gender representation in healthcare professions. The age distribution demonstrated the proportion of 28.6 percent between 25-35 years, 35.2 percent of the participants aged between 36-45 years, 24.1 percent under 46-55 years, and 12.1 percent over 55 years. Registered nurses (45.8%, n = 617), physicians (23.4%, n = 315), nurse practitioners (12.7, n = 171), pharmacists (10.3% n = 139), and other allied professionals (7.8, n = 105) participated in professional composition. The number of years of clinical experience was also highly differentiated, and some participants (22.1 percent) had between 2 and 5 years of experience, some had between 6 and 15 years (31.4 percent), between 16 and 25 years of experience (28.9 percent), and over 25 years (17.6 percent) of professional practice. Speaking of geographic types, there were urban healthcare settings (67.2), suburban facilities (21.8), and rural healthcare facilities (11.0). Educational levels of the respondents were bachelor degree (42.3 percent), master degree (38.7 percent), doctoral degree (15.2 percent) and associate degree (3.8 percent). A major number of practice settings were acute care hospitals (48.6%), with outpatient clinics (24.3%), specialty practices (15.7%), and community health centers (11.4%) following them. The sample reflected a great variety of the case presentations in diverse specialties in healthcare with internal medicine (18.9%), emergency care (14.2%), oncology (12.6%), pain treatment (10.8%), and psychiatric care (9.3%) being the most often represented fields.

Findings

The results of knowledge assessments demonstrated considerable knowledge deficits concerning the basics of medical cannabis in all the professional groups. The mean knowledge score of the total respondents across the scale was 47.2 percent (SD = 18.6) on the scale of 100 points, and the pharmacists scored the highest (M = 62.4, SD = 16.3), followed by physicians (M = 51.8, SD = 17.9), nurse practitioners (M = 48.7, SD = 18.2), registered nurses (M = 43.1, SD = 18.8), and other allied health The most developed gaps of specific knowledge sources were related to the knowledge of the endocannabinoid system, where only 23,7 percent of the respondents expressed sufficient knowledge about the basics of physiological processes. The percentages of those who successfully understood the pharmacokinetics depended on the route of administration, as 67.3 percent apportioned the determination of oral bioavailability rightly, but only 34.6 percent learned the pharmacokinetics of vaporization. Knowledge of a legal and regulatory nature was of especial concern with 41.2 percent of the participants failing to give the correct answer to basic requirements of the law as practiced in their jurisdiction. Knowledge of drug interactions was poor, of which 58.9 percent could not name the possibility of drug interaction between cannabis and some common medications(10). The dosing and titration knowledge levels were poor in 73.4 percent of the study participants, which can be a serious issue of patient safety. Only 18.6 percent of the participants reported educational exposure involving cannabis subjects in the course of their professional training, and the results were vastly disparate across years of graduation ($p<0.001$). The graduates with less than 5 years were most likely to report exposure in education on cannabis (31.2%) than graduates with a period that was more than 15 years ago (8.7%). Participation in continuing education in cannabis-related topics was reported in 24.3 percent, pharmacists had the highest rates of participation (42.1 percent) and allied health professionals the lowest (11.8 percent). Confidence in the ability to offer cannabis-related patient care was poor in all groups with a mean confidence score of 2.3 out of 7 points.

Professional Attitude and Perspective and Measurements

The attitude test showed contradictory and non-trivial views on the possibility of medical cannabis in healthcare practice. The general attitude to medical cannabis was not very high (mean = 4.8, SD = 1.4, Likert-scale 7-points), but there was a significant difference between professional groups ($F(4,1342) = 23.7$, $p < 0.001$). Nurse practitioners exhibited the best attitudes (M=5.4, SD=1.2), physicians (M=5.1, SD=1.3), registered nurses (M=4.9, SD=1.4), pharmacists (M=4.6, SD=1.5) and allied health professionals (M=4.3, SD=1.6). The issues related to safety were also evident, whereby 78.4 percent were in the role of having moderate to very high concerns with regards to the adverse effect and 65.7 percent were worried with regards to medications interactions. The highest levels of participating concern were reported in professional liability issues by 82.6 percent of the individuals with physicians (91.3 percent) expressing the greatest point of concern and nurses (76.8 percent) scoring as more

retrospective. The levels of efficacy beliefs depended on the medical condition with the highest levels of agreement on chronic pain management (87.2%), epilepsy treatment (79.6%), cancer-related symptoms (74.3%), and mental health conditions (52.1%). The recreational use normalization issue and the workplace impairment issue generated the greatest level of skepticism (the percentages of those who are concerned are 68.9 and 75.4 respectively). The level of integration ready was varied with 34.7 percent considering their workplace as adequately prepared to implement cannabis programs and 41.2 percent considered themselves inadequately prepared to implement programs in organizations, and 24.1 percent were not sure whether on not organizations were prepared to implement cannabis programs. The attitude toward interprofessional collaboration was rather positive, with 71.8 percent willing to cooperate with cannabis-specified colleagues and 63.4 percent interested in being included in a multidisciplinary cannabis care team. There were also powerful patient advocacy reactions with 84.6% holding that the patient should and in some cases have a right to evidence-based cannabis therapies when indicated but 67.3 percent insisting that they should be better controlled and regulated.

TABLE 2 Results

Category	Findings
Demographics	
Gender Distribution	72.3% women (n=974), 27.7% men (n=373)
Age Distribution	28.6% (25-35 years), 35.2% (36-45 years), 24.1% (46-55 years), 12.1% (over 55 years)
Professional Composition	Registered Nurses (45.8%, n = 617), Physicians (23.4%, n = 315), Nurse Practitioners (12.7%, n = 171), Pharmacists (10.3%, n = 139), Allied Professionals (7.8%, n = 105)
Years of Clinical Experience	22.1% (2-5 years), 31.4% (6-15 years), 28.9% (16-25 years), 17.6% (over 25 years)
Geographic Location	Urban (67.2%), Suburban (21.8%), Rural (11.0%)
Educational Levels	Bachelor's Degree (42.3%), Master's Degree (38.7%), Doctoral Degree (15.2%), Associate Degree (3.8%)
Practice Settings	Acute Care Hospitals (48.6%), Outpatient Clinics (24.3%), Specialty Practices (15.7%), Community Health Centers (11.4%)
Specialties Represented	Internal Medicine (18.9%), Emergency Care (14.2%), Oncology (12.6%), Pain Treatment (10.8%), Psychiatric Care (9.3%)

Integration Pattern of Clinical Experience and Practice

Experience with medical cannabis was significantly different among participants and locations of practice. The prevalence of direct patient care with cannabis therapy was 28.7 percent (n=387), which differed significantly by specialty area (29.0 percent [n=353] in family medicine, 5. 3 percent [n=13] in internal/geriatric medicine, 26. 2 percent [n=45] in pediatrics, and 20. 5 percent [n=21] in a mix of other specialty areas (causal treatment codes 1. 2, 1. 8, The specialists in pain management have the highest rates of involvement (73.2 percent) followed by the oncology providers (61.8 percent) whereas the practitioners of emergency medicine have the lowest rate (12.4 percent). The number of consultations by patients was daily in 8.3 percent of the participants, monthly or less frequent in 54.7 percent, or fewer. Common clinical situations involved dosing recommendations (76.2 percent of experienced providers), assessment of drug interaction (68.4 percent), side effect management (59.7 percent) and product selection advice (47.3 percent). The evaluation of the perceived patient outcome was predominantly positive among the experienced providers and 71.6 percent of the experienced says they had satisfactory therapeutic outcome and 18.9 percent said excellent outcome. Difficult cases were often blamed to the improper dosing guidelines (43.2%), poor patient compliance (38.7%), and lack of the product standardization (34.9%). The documentation practices were diverse and 67.3% engaged in the deployment of standardized assessment tools, whereas the rest used narrative documentation (32.7%). The referral patterns indicated that 52.8 percent of the total number of providers referred their complex cases to specialists and 47.2 percent handled cases entirely but with consultations. Effective quality improvement activities were present to a limited extent, making up only 23.6

percent of healthcare establishments that had defined the quality indicators of cannabis. Systematic measurement of patient satisfaction with cannabis care was rare, but 78.4 percent of experienced providers reported it to be high. Identification of the professional development needs was made regularly, the percentage of skilled providers looking at the further training opportunities rose to 89.7%, and seeking mentorship programs in cannabis cares competency development rose to 76.2%.

7.Conclusion and Future work

The systemic analysis of the attitudes of healthcare providers towards the integration of medical cannabis shows that the situation is quite complex and is brightened by extremely cautious optimism which is undermined by both huge knowledge gaps and institutional obstacles which should be broken down to guarantee successful and safe integration of cannabis-based therapeutic programs. Evidence shown that although the field of healthcare professionals admits the therapeutic potential of medical cannabis and indicate their willingness to introduce evidence-based cannabis treatments into practice, the essential gaps in the fundamental knowledge provisions such as pharmacology, dosing patterns of cannabis drugs, drug interactions and regulatory compliance standards are rather impressive. These gaps in knowledge are not merely academic, but rather real dangers to patient safety and efficacy of therapy, which will likely ruin the validity and effectiveness of medical cannabis programs as long as gaps are not filled. The indication of educational exposure and professional confidence being positively correlated in the research presented in this paper makes it clear that thorough training programs need to be developed to allow filling the gap in the transition between newly revealed science of cannabis and proficient clinical practice. Moreover, the inconsistency in the attitudes and experience in various professions in healthcare highlights a consideration to have specialized delivery of education according to the specialty where the special bodies deal with unique clinical settings and the patient demographics where various special groups work. The high-value result portrayed by the participants when regarding the nature of the patient advocate approach and being worried about the level of the preparation they currently experience means that healthcare professionals are destined to give the best cannabis care but need considerable institutional and educational support to reach the aforementioned care. The issues causing integration difficulties, currently discovered during the present study, are not limited to the knowledge of singular practitioners, and encompass the scope of systemic concern to cover organizational preparedness and interprofessional collaboration frameworks and mechanisms of quality assurance that are necessary in order to sustainably and efficiently implement cannabis programs. The products of the findings suggest practical implications that should be utilized by healthcare administrators, educational facilities, and policymakers ensuring the collaboration between them in the development of the supporting conditions of evidence-based cannabis medicine implementation with upholding the utmost levels of patient safety and professional responsibility.

Training and educational Considerations to Healthcare Systems

The significant gaps in knowledge that have been observed in all professional groups require the evolution of the multi-level educational programs that will be able to fill the short-term knowledge requirements of the practice specialists and long-term competency rollout demands of the healthcare people involved in the care of medical cannabis. Educational interventions should be assembled in awareness that cannabis medicine is a revolutionary therapeutic paradigm that entails knowledge of not just complex pharmacology, but also the individualized dosing paradigm as well as patient-centred care paradigms that can be substantial paradigm shift in reference to conventional pharmaceuticals. Core medical cannabis education ought to include the fundamental knowledge of endocannabinoid basic physiology, cannabis pharmacokinetics and pharmacodynamics, dope types and administration styles, dose and titration recommendations, matters of drug interaction, and law legal systems concerning the use of medical cannabis in the targeted jurisdiction. The specialty-related applications, complicated case management, interdisciplinary cooperation procedures, and quality enhancement techniques that will assist in maintaining a constant improvement in the delivery of cannabis should be covered in the advanced training modules. The learning process should be multimodal and include didactic learning, cases discussion method, simulation activities, mentorship program that could suit various learning patterns and professional commitments, but it should provide sufficient skills production and competence confirmation. Considering the active rate of development of the science and laws regarding cannabis, educational programs should include systems of updates and continuous learning the healthcare professional can use to stay up to date with new studies, new products and changing best practices. Professional associations be in the fore front to create uniform standards in competency

models, certification standards, continuing education and qualification standards that would hold a high level of uniformity through various health facilities and geographical locations. The ethical and professional implications of the cannabis-specific medicine should also be covered in terms of both educational and training. The issues regarding the patient autonomy, workplace regulations, professional liability risks, and boundaries maintenance situations involving psychoactive substances definitely should be covered in the educational process. The decision to include cannabis education in formal healthcare curriculums should not be detached as one of the long-term approaches to ensuring that future healthcare professionals embark into the practice field with basic knowledge and skills of competent provision of cannabis care to the population. Simulated training programs have a special potential as a means of developing skills, which can be used by healthcare professionals to test themselves in clinical situations related to cannabis, safe risk-free scenario-based practice prior to exposure to the scenario situations in actual patient situations.

Implications of Policy/Regulation to Healthcare Practice

These results of such research have far-reaching consequences in the establishment of healthcare policies and regulatory frameworks that dictate the implementation of medical cannabis, and in general, it is noted that studies must be relied on to develop healthcare policies that strike the right balance between the provision of medical cannabis to patients and safety issues on one hand and allow healthcare professionals to deliver care in the most effective manner possible. Existing regulatory models can lack the practicalities of clinical cannabis application and leave defenders and regulators confused and unsure of what is considered to be the best course of action to take to secure effective design of the programs and even jeopardize the patience safety due to lack of adequate control or overregulation that restricts treatment opportunities. Policy formulation should be informed by the fact that medical cannabis is an unmatched type of treatment and should be regulated in a special manner that is not the substance as conventional medications and the ones used recreationally, but that represents both the complexity of plants as a therapeutic source and adequate controls over quality and safety. The policies of healthcare facilities need to regulate various aspects such as patient eligibility condition, prescription and filling process, training of staff, documentation duties, quality checking measures, and work safety issues which can safeguard the patients and staff working in a medical facility. Improving the current state of standardized clinical practice guidelines is an essential demand that necessitates the participation of healthcare organizations, professional associations, regulatory bodies, and cannabis medicine professionals in developing evidence-based guidelines that might be used to inform clinical practice by providing a framework in defining clinical decision-making that does not prevent individualized care needs of patients. Policies on insurance coverage are also another major field that should be addressed since the current restrictions on coverage impose a gateway to the access of patients and potentially lead patients to unregulated options or ineffective treatment methods, which are unsafe and inefficient. The regulation of licensing and scope of practice should be reformed to adhere to the standards of cannabis medicine, demarcating the roles, and responsibilities of various health practitioners and maintaining proper control and accountability of the activities surrounding cannabis care. The current improvement of quality and monitoring of patient safety systems needs improvement focusing on capturing cannabis-specific results and adverse events so that healthcare systems can determine the best practices and safety issues well ahead of time. The regulatory agency also needs to think about research priorities and data collection demand that can facilitate the generation of evidence and the constant development of cannabis care delivery. Such cooperation and harmonization activities have the potential to promote the sharing of knowledge and best practices in different healthcare systems and regulatory frameworks, with the net effect of enhancing patient care with less burden in implementation on healthcare institutions.

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Conflicts of interest

The authors have no conflicts of interest to declare

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