

Nurse's Attitudes and Perceptions Towards Medical Cannabis Legalization in Thailand

Sumamita Sawasdinarunart, R.N., Ph.D.¹, Duangsuda Siripituphum, R.N., Ph.D.¹,
Khomapak Maneewat, R.N., Ph.D.¹, Hathairat Sangchan, R.N., Ph.D.¹,
Yupawadee Kantabanlang, R.N., Ph.D.², Sasikaan Nimmaanrat, M.D.³,
Puttisak Puttawibul M.D.⁴, Suphawut Laohawiriyakamol, M.D.⁴,
Piyapun Wangkulangkul M.D., Ph.D.⁴, Sahas Bilalee, M.Sc.⁵

¹Division of Adult and Gerontological Nursing, Faculty of Nursing, Prince of Songkla University, Songkhla 90110, Thailand.

²Department of Adult and Gerontological Nursing, Boromarajonani College of Nursing Suratthani, Faculty of Nursing, Praboromarajchanok Institute, Ministry of Public Health, Suratthani 84000, Thailand.

³Department of Anesthesiology, Faculty of Medicine, Prince of Songkla University, Songkhla 90110, Thailand.

⁴Department of Surgery, Faculty of Medicine, Prince of Songkla University, Songkhla 90110 Thailand.

⁵Trauma ward, Songklanagarind Hospital, Prince of Songkla University, Songkhla 90110, Thailand.

Received 7 July 2023 • Revised 25 August 2023 • Accepted 25 August 2023 • Published online 12 January 2024

Abstract:

Objective: To determine the attitudes and perceptions among nurses towards legalization of cannabis for medical use in Thailand.

Material and Methods: This anonymous, cross-sectional paper and online survey was conducted from May 2020 to November 2021. Data collection was done using the *Cannabis as Medicine: Thai Nurse's Attitudes and Perceptions* Survey. Descriptive statistics were used to analyze the data.

Results: This study included 287 Thai registered nurses across Thailand. The top 3 positive attitudes and perceptions among the nurses were: 1) currently, most patients use or intend to use cannabis oil, 2) it's not uncommon if nurses with advanced cancer decide to use cannabis oil, and 3) a patient's values and beliefs in cannabis oil can them feel better. The top 3 negative attitudes and perceptions were: 1) cannabis reduces tumor growth in advanced cancer stages,

Contact: Duangsuda Siripituphum, R.N., Ph.D.
Division of Adult and Gerontological Nursing, Faculty of Nursing,
Prince of Songkla University, Songkhla 90110, Thailand.
E-mail: duangsuda.wo@psu.ac.th

J Health Sci Med Res 2024;42(3):e20241026
doi: 10.31584/jhsmr.20241026
www.jhsmr.org

© 2024 JHSMR. Hosted by Prince of Songkla University. All rights reserved.
This is an open access article under the CC BY-NC-ND license
(<http://www.jhsmr.org/index.php/jhsmr/about/editorialPolicies#openAccessPolicy>).

2) nurses administer medical cannabis as other medications; and (3) nurses like taking care of patients with the non-medicinal use of cannabis.

Conclusion: Thai registered nurses were more likely to have negative attitudes towards medical cannabis. The respondents required to increase their knowledge about medical cannabis. Understanding Thai nurses' attitudes and perceptions towards medical cannabis use is necessary to see their insider views, the difficulties they face, and provide room for improvement to enhance the benefits and safety of medical cannabis use. Future research with larger sample sizes is recommended to strengthen the quality of evidence.

Keywords: nurses' attitudes, nurses' perceptions, medical cannabis

Introduction

Cannabis has been classified in narcotics Category 5 under the Narcotics Act of Thailand since 1979. In 2018, Thailand became the first Southeast Asian country to legalize cannabis for medical purposes for people aged 20 years and above¹. In 2019, Thailand's Ministry of Public Health (MOPH) launched a series of pilot medical cannabis clinics which was extended to 1,026 clinics in early 2023 for dispensing traditional Thai and modern medicinal cannabis products to clients. In 2022, Thailand's MOPH, on behalf of the Thai government, decriminalized cannabis extracts containing tetrahydrocannabinol no more than 0.2 percent by weight. After medical cannabis legalization, there was a growing number of patients using cannabis in addition to or as a substitute for prescription medications². Like medical cannabis users in other nations, Thais used cannabis products to treat medical conditions based on their attitudes, perceptions, or experience regardless of the scientific evidence or prescription instructions²⁻³.

Currently, medical cannabis is approved to be recommended and prescribed for patients with specific medical conditions by authorized healthcare professionals according to prescription regulations and guidelines of the Thai Government Pharmaceutical Organization and the Food and Drug Administration⁴. Consequently, health professionals who work in Thailand are frequently involved with hospitalized patients using or considering the use of

medical cannabis. Adequate validated knowledge can shape proper attitudes and inform best clinical practice about medical cannabis⁵⁻⁷.

In the era of evidence-informed clinical practice, there is limited high-quality evidence to support the efficacy and safety of medical cannabis⁸⁻⁹. Also, most medical cannabis users use unapproved medicinal cannabis products obtained from illegal sources². As a result, various studies have found that Thai healthcare professionals lack confidence to support the use of medicinal cannabis, including concerns regarding its safety and efficacy for users^{5,10-12}. Other studies reported positive views of medical cannabis treatment among healthcare providers in New Zealand, Austrian university students, Australian and New Zealand health professionals, oncology nurses and oncology physicians¹³⁻¹⁶.

Attitudes and perceptions of healthcare providers regarding medical cannabis and its users shape the ways they respond and practice when involved in medical cannabis situations^{14,17}. Controversies surrounding the use of medical cannabis by healthcare providers seem to be a common problem in Thailand and around the globe¹⁷. The successful legalization of medical cannabis requires appropriate perceptions and attitudes among healthcare professionals. Their support of medical cannabis helps its users avoid health risks while realizing its potential therapeutic benefits¹⁸. One study found that attitudes and

perceptions towards medical cannabis were influenced by the healthcare provider's expectations and anticipations of the safety and effectiveness of cannabis treatment⁵. Other studies reported that healthcare providers' attitudes and perceptions towards the medical use of cannabis were rooted in their subjective, descriptive, group, injunctive, or social norms and their perceived stigma towards cannabis and its users^{4,6,17}. In consequence, medical cannabis products are often not used under physicians' prescription and supervision².

A previous study conducted among healthcare providers and health volunteers in district health systems in Thailand revealed a low level of perceived knowledge and negative attitudes towards medical cannabis. More positive attitudes were found in the health volunteers who had familiar experiences with cannabis use in the community than in the healthcare providers¹⁹. In order to increase adherence to prescriptions, safety, and efficacy of using cannabis for medical purposes, it is necessary to examine the understanding of current perceptions and attitudes regarding medical cannabis from the viewpoints of healthcare providers who encounter this situation.

To date, no study has examined how these Thai healthcare professionals are educated and knowledgeable about medical cannabis after its legalization in Thailand. The aim of the present study was to explore perceptions and attitudes toward medical cannabis use among registered nurses in Thailand.

Material and Methods

A descriptive cross-sectional study using paper and online anonymous questionnaire surveys was conducted with registered nurses across Thailand.

Data collection was done using the Cannabis as Medicine: Thai Nurses' Attitudes and Perceptions Survey (CAM-TNAPS). The questionnaire was developed and modified from the Substance Abuse Attitude Survey for measuring drug attitudes in medical education²⁰.

The CAM-TNAPS questionnaire consisted of 60 items containing both positive and negative stances. The respondents were asked to rate their level of agreement for each item using a 5-point Likert scale. Reverse scoring was used for negatively worded survey questions. The scale-content validity index of the CAM-TNAPS was 0.9. Cronbach's alpha coefficient was calculated to measure the internal consistency or the level of agreement of the questionnaire. The Cronbach's alpha value of the CAM-TNAPS was 0.9.

At the time of the study, there were controversies concerning the common myths and misconceptions surrounding the medical use of cannabis. The Royal College of Medical Professionals of Thailand sequentially published statements raising their concerns about the negative impacts resulting from greater accessibility to cannabis. Over and above that, following early 2020, Thai healthcare professionals and researchers were faced with the new worldwide COVID-19 pandemic in Thailand. Consequently, the research team for this study encountered unexpected difficulties and challenges in recruiting volunteers to participate in activities unrelated to COVID-19. Finally, a convenience sampling procedure was undertaken, based on the willingness of individuals to provide data. A sample size estimation was not practical in conducting this research which involved controversial attitudes, beliefs, values, and biases of individuals or groups in society²¹⁻²³.

Ethical approval for this study was obtained from the Institutional Review Board of the researchers' institution (PSU IRB 2020-NL 007). The targeted groups were recruited via email and a postal invitation after getting data collection permission from each target setting. The completion and return of the questionnaires from the respondents were accepted as evidence of obtaining consent to participate in this study. The respondents were then asked to fill out a set of questionnaires including a demographics survey according to their preferences upon giving the consent.

An Excel spreadsheet was used to organize the online survey data. Descriptive statistics were used to analyze the data using frequencies, percentages, and ranges.

Results

Only completed questionnaire responses returned from the respondents were included in the analysis. The final sample involved 287 returned questionnaires. However, since the decision to answer or not answer any question was based on the judgement of the respondents, the actual number of responses for each item varied.

In total, the respondents consisted of 9 male and 278 female nursing professionals aged 30–39 years. The highest education degree of the respondents was a bachelor's degree (77.0%). Concerning job titles, the majority of the respondents were staff nurses at the practitioner level (51.5%). Most respondents had more than ten years of work experience. A large majority of the nurses reported that they did not have any experience or interest in medical cannabis use, training, knowledge, or news. Thirty-seven nurses reported using medical cannabis to treat family members, friends, or intimates.

The respondents' levels of agreement values given for each item of each domain were analyzed to determine their attitudes and perceptions toward medical cannabis. 287 nurses completed and returned the questionnaires.

Table 1 presents the top 5 items with the highest values of attitudes and perceptions, while Table 2 shows the 5 items with the lowest values of attitudes and perceptions. The levels of agreement of each coherent and stable factor were analyzed to determine the items with negative and positive attitudes and perceptions. Tables 3 and 4 show the first 3 items with the highest and the lowest values of agreement for each domain.

The open-ended questions regarding roles, functions, responsibilities, or scope of practice, including medical cannabis knowledge and educational training programs required from their points of view, were answered and returned by 77 nurse respondents (26.8%). Qualitative content analysis was used to quantify and analyze the presence of certain themes or commonalities in their answers. The data analysis to identify the scope of practices regarding medical cannabis revealed that every respondent required legal implications of medical cannabis pertaining to the involvement, prescription, administration, and permission to use in the hospital. The majority of respondents said they believed that the scope and standards of nursing practices for medical cannabis use had to be developed by the Nursing and Midwifery Council. Thirty-nine respondents would require legal protection for nurses in case patients developed adverse effects from medical cannabis use. Some respondents suggested that permission to use medical cannabis in the hospital must

Table 1 Attitudes and perceptions items receiving the highest values of agreement from the registered nurse respondents (N=287)

NO	Group	Items	Value
1	Nurse	Currently, most patients use or intend to use cannabis oil.	4.6
2	Nurse	It's not uncommon if terminally ill cancer nurses make the decision to use medical cannabis products	4.1
3	Nurse	Patients' trust and beliefs towards the efficacy of cannabis oil can make them feel better.	4.1
4	Nurse	Cannabis may interact with some medications and may alter their efficacy, or lead to an increased risk of adverse effects.	4.0
5	Nurse	Medical uses of cannabis should be aligned with the supporting evidence.	4.0

Table 2 Attitudes and perceptions items receiving the lowest values of agreement from the registered nurse respondents (N=287)

NO	Group	Items	Value
1	Nurse	Cannabis should be used to decrease metastatic cancer.	1.1
2	Nurse	Nurses can administer medical cannabis products for patients like other medications.	1.2
3	Nurse	Nurses like taking care of patients with the non-medicinal use of cannabis.	1.2
4	Nurse	Cannabis should not be used for intractable epilepsy in childhood due to damage to brain cells.	1.3
5	Nurse	Cannabis should be removed from narcotics Category 5.	1.3

use the same process as approval for any drugs used in the hospital. Twenty-eight respondents required practice standards for medical cannabis administration launched by the hospital.

Discussion

In line with previous studies, the results from the treatment intervention domain revealed the respondents in this present study had negative attitudes and perceptions that had developed from scientific knowledge and evidence about medical cannabis^{24–35}. This can be seen by the general agreement received from the respondents against cannabis use in the treatment of refractory or intractable epilepsy in childhood as well as their self-perceived lack of medical cannabis knowledge and their view of medical cannabis education as significant for nurses. They also felt that strong evidence supporting the efficacy and safety of medical cannabis was required for its used in hospital.

At the time of data collection, it was just the beginning of the free medical cannabis policy in Thailand. Medical cannabis knowledge has not previously been included in the curriculum of Thai nursing programs, Bachelor of Nursing Science programs, or in-service training. Thai nurses in this study, like nurses in other regions reported, lacked sufficient knowledge and clinical experiences in medical cannabis use^{4,35}. In the era of evidence-based nursing, evidence-based practice is cultivated in nursing students before graduation.

A lack of evidence to support the benefits and safety of medical cannabis use and lack of sufficient knowledge concerning cannabis could shape negative attitudes and perceptions among nurses toward its use^{4,10–11}.

Negative attitudes and perceptions were also apparent from the respondents' points of views in both similarities and differences between medical cannabis and other medications. The study results revealed nurses in this study did not view medical cannabis as a medicine. Therefore, the administration of medical cannabis products to patients was not agreed upon concerning the role of nurses and was viewed as unusual as well as not accepted as an alternative therapy. The respondents were more likely to perceive cannabis use for medical purposes the same as for recreational purposes. As shown in Table 3, the negative attitudes and perceptions of the respondents towards medical cannabis in this permissiveness domain were linked and supported by the results of other domains.

Concerning the treatment perspective domain, even though the nurse respondents agreed that cannabis oil is commonly used among Thai patients, they viewed cannabis use as having little to no medical benefits with a greater chance of harmful effects. They expected to see a high number of patients with cannabis poisoning. They also expected a negative impact of legalized medical cannabis on the nursing workload in hospitalized patients. The nurse respondents negatively viewed medical cannabis through the lens of their moral values over aesthetic principles and

Table 3 Items in each domain with the highest values of agreement received from the nurse respondents (N=287)

NO	Items	N (%)
Domain: Treatment intervention		
1	Cannabis may interact with some medications and lead to adverse effects.	283 (98.6%)
2	Cannabis should not be used for intractable epilepsy in childhood due to damage to brain cells.	283 (98.6%)
3	I don't know not only which patients are at high risk from medical cannabis use but also its side effects.	264 (92.0%)
Domain: Permissiveness		
1	Patients who use medical cannabis are not under nurses' responsibility.	266 (96.7)
Domain: Treatment optimism and treatment pessimism		
1	Most patients use or want to use cannabis oil.	257 (89.6)
2	Medical cannabis users require increased time from the nurse.	261 (91.0)
3	Emergency medical care service for cannabis poisoning will have to be provided for medical cannabis users soon.	221 (77.0)
Domain: Ethical criticism		
1	Nurses should not be responsible for patients who develop problems from their own use of medical cannabis.	247 (90.2)
2	Nurses are accused as violating the code of ethics for nurses if they allow patients to use medical cannabis despite its harmful effects on the patients.	210 (73.4)
3	Patients asking for a consultation about cannabis use can make a nurse feel uncomfortable.	198 (71.0)

Table 4 Items in each domain with the lowest values of agreement received from nurse respondents (N=287)

NO	Items	N (%)
Domain: Stereotypes vs. Open-minded person		
1	Nurses like taking care of patients with the non-medicinal use of cannabis.	282 (98.2)
2	I never thought I would have to study medical cannabis.	261 (90.9)
3	Cannabis is always a narcotic with harmful physical, psychological, and social effects.	226 (88.6)
Domain: Treatment intervention		
1	Cannabis should be removed from narcotics Category 5.	278 (96.9)
2	Cannabis should be legalized for medical use.	274 (95.5)
3	Cannabis should be used to decrease metastatic cancer.	272 (94.8)
Domain: Permissiveness		
1	Nurses can administer medical cannabis products to patients like other medications.	279 (97.2)
2	Patients should have the right to use medical cannabis with other prescription medications.	225 (78.4)
3	Medical cannabis should be included under the national list of essential medicines in Thailand.	203 (70.7)
Domain: Treatment optimism and treatment pessimism		
1	Despite the explanations take up a great deal of time, I am confident that medical cannabis users will trust and accept information that is derived from facts.	235 (81.9)
2	Nurses should increase the safety of medical cannabis use by encouraging patients to use it only as recommended.	169 (58.9)
3	It's not difficult to advise patients regarding the correct use of cannabis oil.	188 (65.5)

generalized medical cannabis users rather than being open-minded. The high level of agreement given by the nurse respondents according to their perspectives reflected their ongoing stigmatization or even discrimination, encounter avoidance, and lack of a sense of responsibility towards these patients. These study results are congruent with previous studies^{17, 36-38}.

This study demonstrated that the attitudes and perceptions towards medical cannabis from the perspectives of the respondents are informed by the conclusions constructed from individual experiences, values, and social and group norms rather than knowledge and research evidence^{4-6,39}. It is now generally accepted that the number of medical cannabis users across Thailand has been rising. It is notable that the self-use of off-label medical cannabis products without supervision from medical professionals is not uncommon among Thai patients. Thus, they are at increased risk of adverse effects and harm from the use of medical cannabis.

Like nurses in the global arena, Thai nurses have an obligation to prevent unnecessary harm for patients under their care with no exception for those who use medical cannabis. Nursing practice must be in line with the medical council regulations on medical ethics preservation, B.E. 2549 (2006), which states that medical practitioners must not prescribe, use, or provide support for the use of medicines of unknown effect or off-label. Regardless of their personal values and preferences towards medical cannabis, nurses have an ethical responsibility to provide safe and knowledgeable care for medical cannabis patients³⁴. Previous studies highlighted the relationship between healthcare providers' more positive attitudes and lower stigma towards medical cannabis with a higher intention to give recommendations to patients^{5,17}. This is particularly important because Thai nurse respondents in this present study had a more negative attitude and perceptions towards medical cannabis. This could impede their intentions, awareness, and concerns for doing their best practice to

enhance medical benefits and decrease potential harms from the use of medical cannabis^{36,38-39}.

According to nursing care guidelines for patients using medical marijuana, essential and relevant medical cannabis knowledge, principles, guidelines, rules, and regulations are required for nurses who encounter or are expected to encounter patients who use or are interested in using cannabis for medical purposes^{34,40}. In the early phase of the free medical cannabis law in Thailand Thai nurses, as well as other healthcare providers, have received no medical cannabis education, training, and guidelines. Mismatches or gaps between patients' needs and nurses' responses to patients' needs could be noticed here. Moreover, nurses might develop conflicts between responses to or respecting patients' needs or wishes for medical cannabis use and against its usage according to the principle of do no harm. Consequently, a poor nurse-patient relationship could arise. The results of this study support the significance of understanding current attitudes and perceptions of nurses towards medical cannabis use in a particular practice setting prior to developing appropriate education and training programs to better accommodate its users to attain efficacy and safety in the use of medical cannabis³⁶⁻³⁸.

Strengths and limitations

The attitudes and perceptions towards medical cannabis in this study were determined using questionnaires modified from the Substance Abuse Attitude Survey for measuring drug attitudes in medical education. The results represent all aspects measured using these variables from healthcare providers' perspectives surrounding medical cannabis in a Thai context. The results provide information that shows room for improvement to enhance the benefits and safety of medical cannabis.

A low response rate with a small and homogenous sample inhibits the generalization of the results. Overcoming the struggles and challenges in conducting research involving controversial and sociopolitical conflicts during

the many waves of the dreadful COVID-19 pandemic in Thailand was an invaluable experience for the researchers.

Conclusion

Despite the legalization of cannabis for medicinal purposes in Thailand, negative attitudes and perceptions exist among nurses. There are some important factors the nurse respondents used to evaluate medical cannabis situations including their experiences, moral and ethical values, and social and group norms. Negative attitudes and perceptions led them to form particular response patterns or behaviors when they were involved in situations relevant to medical cannabis regardless of facts or evidence or ethical responsibilities. Future studies should focus on the need for medical cannabis education, which is one of the vital strategies to enhance their appropriate attitudes and perceptions towards medical cannabis.

Funding sources

This study received support from the Faculty of Nursing, Prince of Songkla University.

Conflict of interest

There are no conflicts of interest related to this study.

References

1. Ministry of Public Health. Narcotic Drugs Act No.7, B.E.2562 [homepage on Internet]. Nonthaburi: Food and Drug Administration, Narcotics Control Division; 2019 [cited 2021 Dec 6]. Available from: https://mnfda.fda.moph.go.th/narcotic/wp-content/uploads/2021/02/T_0001.pdf
2. Assanangkornchai S, Thaikla K, Talek M, Saingam D. Medical cannabis use in Thailand after its legalization: a respondent-driven sample survey. *Peer J* 2022;10:e12809.
3. Boehnke KF, Litinas E, Worthing B, Conine L, Kruger DJ. Communication between healthcare providers and medical cannabis patients regarding referral and medication substitution. *J Cannabis Res* 2021;3:1–9.
4. Ministry of Public Health. Guidance on Cannabis for Medical Use [homepage on Internet]. 4th ed. 2021 [cited 2021 May 21]. Available from: <https://mnfda.fda.moph.go.th/narcotic/wp-content/uploads/2021/04/Guidance-Updated-v-update-V.4260464.pdf>
5. Gardiner KM, Singleton JA, Sheridan J, Kyle GJ, Nissen, LM. Health professional beliefs, knowledge, and concerns surrounding medicinal cannabis—a systematic review. *PLoS One* 2019;14:e0216556.
6. Giannakopoulou M, Vouzavali F, Paikopoulou D, Paschali A, Mpouzika MD, Karanikola MNK. Attitudes, beliefs and knowledge towards medical cannabis of Greek undergraduate and postgraduate university nursing students. *Complement Ther Med* 2021;58:102703.
7. Ho BC, Barry AB, Koeppel JA, Macleod J, Boyd A, David A, O’Leary DS. Recreational Marijuana use, adolescent cognitive development, and schizophrenia susceptibility. *Biol Psychiatry Glob Open Sci* 2022;3:222–32.
8. Baratta F, Peira E, Maza C, Gallarate M, Brusa P. Cannabis-based oral emulsion for medical purposes to meet the needs of patients: formulation, quality and stability. *Pharmaceutics* 2022;14:513.
9. Fortin D, Marcellin F, Carrieri P, Mancini J, Barré T. Medical cannabis: toward a new policy and health model for an ancient medicine. *Front Public Health* 2022;10:904291.
10. Brady JP, Bruce D, Foster E, Shattell M. Self-efficacy in researching and obtaining medical cannabis by patients with chronic conditions. *Health Educ Behav* 2020;47:740–8.
11. Roberts J. Medical cannabis in adult mental health settings: reconstructing one of the most maligned medications in the United States. *Clin Soc Work J* 2020;48:412–20.
12. Rosenbæk F, Riisgaard H, Nielsen JB, Wehberg S, Waldorff FB, Pedersen LB, et al. GPs’ prescription patterns, experience, and attitudes towards medicinal cannabis—a nationwide survey at the early stage of the Danish test scheme. *BMC Prim Care* 2023;24:17.
13. Withanarachchie V, Rychert M, Wilkins C. The role of cannabis clinics in the health system: a qualitative study of physicians’ views in New Zealand. *BMC Health Serv Res* 2023;23:10.
14. Felinhofer A, Kothgassner OD, Stoll A, Klier C. Knowledge about and attitudes towards medical cannabis among Austrian university students. *Complement Ther Med* 2021;58:102700.
15. Kumar RN, Chambers WA, Pertwee RG. Pharmacological

- actions and therapeutic uses of cannabis and cannabinoids. *Anaesthesia* 2001;56:1059–68.
16. HaGani N, Sznitman S, Dor M, Bar–Sela G, Oren D, Margolis–Dorfman L, et al. Attitudes toward the use of medical cannabis and the perceived efficacy, side-effects and risks: a survey of patients, nurses and physicians. *J Psychoactive Drugs* 2022;54:393–402.
 17. Melnikov S, Aboav A, Shalom E, Phriedman S, Khalaila K. The effect of attitudes, subjective norms and stigma on health-care providers' intention to recommend medicinal cannabis to patients. *Int J Nurs Pract* 2021;27:e12836.
 18. MacCallum CA, Eadie L, Barr AM, Boivin M, Lu S. Practical strategies using medical cannabis to reduce harms associated with long term opioid use in chronic pain. *Front Pharmacol* 2021;12:633168.
 19. Mekrungrongwong S, Kitreerawutiwong N, Keeratisiroj O, Jariya W. Self-perceived knowledge, attitudes, and training needs regarding medical cannabis among health care providers and health volunteers in district health systems, Phitsanulok Province. *BMC Prim Care* 2022;23:266.
 20. Chappel JN, Veach TL, Krug RS. The substance abuse attitude survey: an instrument for measuring attitudes. *J Stud Alcohol* 1985;46:48–52.
 21. Balneaves LG, Alraja A, Ziemianski D, McCuaig F, Ware M. A national needs assessment of Canadian nurse practitioners regarding cannabis for therapeutic purposes. *Cannabis Cannabinoid Res* 2018;3:66–73.
 22. Jacobs NI, Montebello M, Monds LA, Lintzeris N. Survey of Australian psychiatrists' and psychiatry trainees' knowledge about and attitudes towards medicinal cannabinoids. *Australas Psychiatry* 2019;27:80–5.
 23. Karanges EA, Suraev A, Elias N, Manocha R, McGregor IS. Knowledge and attitudes of Australian general practitioners towards medicinal cannabis: a cross-sectional survey. *BMJ Open* 2018;8:e022101.
 24. Arnfinnsen JL, Kisa A. Assessment of Norwegian physicians' knowledge, experience and attitudes towards medical cannabis. *Drugs* 2021;28:165–171.
 25. Carlini BH, Garrett SB, Carter GT. Medicinal cannabis: a survey among health care providers in Washington State. *Am J Hosp Palliat Care*. 2017;34:85–91.
 26. Chan GCK, Hall W, Freeman TP, Ferris J, Kelly AB, Winstock A. User characteristics and effect profile of Butane Hash oil: an extremely high-potency cannabis concentrate. *Drug Alcohol Depend*. 2017;178:32–38.
 27. Kanato M, Leyatikul PM, Wonguppa PL. Medical cannabis law in Thailand. *ONCB J* 2020;36.
 28. Kaplan L, Klein T, Wilson M, Graves J. Knowledge, practices, and attitudes of Washington State health care professionals regarding medical cannabis. *Cannabis Cannabinoid Res* 2020;5:172–82.
 29. Makki I, Zheng-Lin B, Kohli M. Medical marijuana knowledge and attitudes amongst internal medicine residents. *BMC Prim Care* 2022;23:38.
 30. Nitti Y, Messmer PR. Critical factors that influence nurses' knowledge, perceptions and attitudes of medical cannabis usage by patients [homepage on Internet]. Miami: Miami Dade College; 2021 [cited 2021 May 21]. Available from: <https://sigma.nursingrepository.org/bitstream/handle/10755/18615/Slides.pdf?sequence=1>
 31. O'Rourke R, Lima ML, Jetten J. Healthcare professionals and medical cannabis: a scoping review informed by the theoretical domains framework. *J Public Health* 2022;30: 1901–1913.
 32. Philpot LM, Ebbert JO, Hurt RT. A survey of the attitudes, beliefs and knowledge about medical cannabis among primary care providers. *BMC Fam prac* 2019;20:1–7.
 33. Rice ASC, Belton J, Arendt Nielsen L. Presenting the outputs of the IASP presidential task force on cannabis and cannabinoid analgesia. *Pain* 2021;162(Suppl 1) S3–S4.
 34. National Council of State Boards of Nursing. The NCSBN national nursing guidelines for medical marijuana. *J Nurs Regul* 2018;9,S3–S59.
 35. Zolotov Y, Metri S, Calabria E, Kogan M. Medical cannabis education among healthcare trainees: a scoping review. *Complement Ther Med* 2021;58:102675.
 36. Cheng KYC, Harnett JE, Davis SR, Eassey D, Law S, Smith L. Healthcare professionals' perspectives on the use of medicinal cannabis to manage chronic pain: a systematic search and narrative review. *Pain Pract* 2022;22:718–32.
 37. Clobes TA, Palmier LA, Gagnon M, Klaiman C, Arellano M. The impact of education on attitudes toward medical cannabis. *PEC Innov* 2022;1:100009.
 38. Kurtzman ET, Greene J, Begley R, Drenkard KN. Nurse leaders' attitudes toward and experiences with medical marijuana. *J*

- Nurs Regul 2022;13:10–24.
39. Earle KA. Medical cannabis: healthcare professionals' attitudes, perceptions, and behaviors [homepage on Internet]. Montana, Montana State University; 2020 [cited 2022 Feb 18]. Available from: <https://scholarworks.montana.edu/xmlui/handle/1/15872>
40. Minister of Health Canada. Cannabis Regulations [homepage on Internet]. Ontario: Digital Transformation Office, Government of Canada; 2020 [cited 2022 Feb 18]. Available from: <https://laws.justice.gc.ca/eng/regulations/SOR-2018-144/page-1.html>