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Decision-Making Experiences to use Medicinal Cannabis: Perspectives from Patients with Knee Osteoarthritis and Their Care Providers

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Abstract

This study investigated the experience of making a decision to use medicinal cannabis among patients with knee osteoarthritis and their care providers. This qualitative research used a phenomenological approach to collect information by purposive sampling. Informants included 7 patients with knee osteoarthritis and 18 care providers in Khon Kaen municipality. Data were collected from June until December 2021 using in- depth interviews, field records and participatory observation. After 6 months of data collection, the modified Colaizzi's seven-step method was used for data analysis. The results show that the content from all informants can be categorized into 7 distinct themes about their decision-making on using medicinal cannabis (MC): 1) The needs for MC: Recognizing the painful nature of osteoarthritic pain and the limited treatment options available 2) Beliefs and attitudes towards MC with two sub-themes identified as 2.1) Belief in the MC's efficacy that denotes informants' positive perception and 2.2) Attitudes towards MC that show doubt, hesitation, or lack of confidence in MC's effectiveness 3) Evidence on efficacy and safety of MC products: Considering cannabis as a viable treatment option 4) Trustworthiness of information and communication about MC. 5) Influence of other people: Three key influencers in the decision-making process including 5.1) Patients themselves 5.2) Friends and peers 5.3) Doctors and healthcare professionals 6) Legitimacy status of MC and 7) Product designs regarding forms of therapeutic use. The findings yielded 7 distinct themes concerning the decision to use medicinal cannabis (MC). The most important component is the need for pain relief among knee osteoarthritis patients. They clearly need MC for relieving their symptoms. Evidence on efficacy and legalization status of MC are also the main factors, while other 4 components are less important or not the vital factors for making decision on MC's utilization. Policies on MC need to address these factors.

Keywords**:** *Decision-making experience; medicinal cannabis; patients with knee osteoarthritis; care providers*

1. Introduction

Osteoarthritis is one of the most common arthritides and is the leading cause of mobility impairments and disabilities in the elderly (Cui et al., 2020; Mora et al., 2018). The most common predominant symptom of the disease is the pain

which causes patients to need medical care (Neogi, 2013). Unsatisfactory treatment results lead to seeking a wider range of treatments. Increased harm is common, especially when the patients use non-steroidal anti-inflammatory drugs (NSAIDs) inappropriately. Serious side effects on gastrointestinal and renal systems can occur. On the other hand, if the knee osteoarthritis becomes severe and remains untreated or is treated improperly, it can lead to disability, and affects the patients' mental health as well as there being numerous costs, direct and indirect (Litwic et al., 2013; Losina et al., 2015; Peungsuwan et al., 2019; Ruiz et al., 2013).

Globally, the prevalence of osteoarthritis in 2020 was 16.0% and there were 203 incidents per 10,000 people per year (Cui et al., 2020). In Thailand, studies have shown that knee pain in older adults is associated with osteoarthritis. The prevalence of osteoarthritis among older farmers was 23% [95% confident interval (CI): 17.75 to 30.05%] (Peungsuwan et al., 2019).

With today's medical advances, there are many alternative treatment options that need to be proven. Cannabis-based medicines are among the most popular options. This is because cannabis is a medicinal herb that has many uses in medicine and other benefits. Cannabis extract is used in many countries around the world to treat many persistent ailments. Chronic pain is one of the highly selective objectives (Cyr et al., 2022). A survey of 20 cannabis clinics in five Canadian provinces found that medicinal cannabis was prescribed for pain at 79%, insomnia at 40% and anxiety at 34% (Piper et al., 2017; Sexton et al., 2016; Stienrut et al., 2020). Cannabis was also used to reduce pain in dogs with osteoarthritis (Osteoarthritis: OA) by using cannabidiol (CBD) oil at a dosage of 2 mg/kg twice daily; the results showed that the pain in osteoarthritic dogs was relieved safely and they could do more activities (Gamble et al., 2018).

Over the past decade, more and more patients have turned to medicinal cannabis, even though it has been illegal all along. A study of the reasons for making the decision to try medicinal cannabis showed that 51.5% of the respondents learned about the benefits of cannabis by themselves, 10.5% learned on the Internet, 9.9% from friends or family members, 6.5% from medicinal cannabis advocates, 5.6% from disease-specific users, and 5.0% from healthcare providers. Interestingly, this study found that chronic pain management among the medicinal cannabis users were quite different.

Thailand was the first country in ASEAN to allow legal use of medicinal cannabis and research in 2019. Medicinal cannabis research is however moving forward quite slowly. To date, there has never been any comprehensive study of the decision-making to use medicinal cannabis in osteoarthritic people from the perspective of the patients and caregivers. One of the reasons for that is that osteoarthritis has not been recognized in the indications for medicinal cannabis use.

This indicates the need for further research to determine what factors or components are involved in the decision-making process to use medicinal cannabis for specific therapies (Boehnke et al., 2019). Pertinent data found will definitely be significant for future use i.e., as a baseline to consider in revising the medicinal cannabis policies to meet the needs of both the care providers and the patients.

2. Objectives

To study the decision-making experiences of patients with knee osteoarthritis and their care providers regarding the use of medicinal cannabis.

3. Materials and methods

This study applied qualitative research using a phenomenological approach. The main informants consisted of both patients with knee osteoarthritis and their care providers who lived in Khon Kaen Municipality, Khon Kaen Province, Thailand. They were recruited by purposive sampling based on the defined qualifications as follows.

For patients: There were 7 patients with knee osteoarthritis, both male and female, aged 50 years and over. They had knee osteoarthritis symptoms according to the clinical requirements of the American College of Rheumatology (ACR) (Altman et al., 1986). The patients suffered knee pain and had 3 of the following 6 criteria: 1) aged over 50 years; 2) stiffness less than 30 minutes; 3) crepitus; 4) pain in knee joints (bony tenderness); 5) thickening of the knee joints (bony enlargement); 6) no signs of arthritis (no palpable warmth) with or without experience using medicinal cannabis.

For care providers: There were 18 medical and health professionals with or without experience related to prescribing medicinal cannabis, dispensing medicinal cannabis, or providing health care for patients using medicinal cannabis. This

group comprised 2 orthopedists, 2 rehabilitation physicians (PMR), 3 family doctors, 7 Thai traditional medicine practitioners or folk healers trained in Thai traditional medicinal cannabis courses, 2 registered nurses and 2 pharmacists.

The researchers were the human research instruments who were formally trained and therefore qualified in qualitative research processes.

A semi-structured interview questionnaire about the decision-making experience of using medicinal cannabis was developed by the researchers and reviewed by experts to verify the quality of the content, questions, and consistency with the study objectives, and was finally revised for improvements.

This research was approved by the Research Ethics Committee, Khon Kaen University, on June 4th, 2021, certificate No. HE 641165. At every step of this study, the researchers were aware of and followed the principles of research ethics. The researchers protected the rights of all informants by introducing themselves first and informing them about the objectives of the study, asking for consent to participate as a key informant in the research, asking for permission prior to the interviews and audio recording and taking notes by asking the participants to sign the consent forms. The participants had freedom to remain in the study or leave at any time. Information about the participants' responses were coded to protect the participants' identities and all the data were kept confidential.

For data collection methods, the researchers took the following steps: the researchers selected the Samliam Primary Care Center area as the starting point for this study and as a gate keeper to lead the researchers to other target groups listed above. The primary care units would provide supporting data that there were phenomena that met the needs of the study. The researchers reached out to the heads of the primary care units in the research area to introduce themselves and inform them about the research study. Subsequently, the heads introduced the researchers to potential informants. The researchers later brought the registered nurses to meet with the village health volunteers who would take the researchers to meet the informants at home. The researchers introduced themselves to the informants to build rapport, and informed them about the study. After that the researchers asked for consent to participate in the research, and also asked the informants to sign the consent forms once the informants agreed to participate in the research and gave permission for audio recording. Also, the researchers made appointments to meet with the informants at a convenient time for them for the next meeting.

The data were then collected by in-depth interviews using a semi-structured interview questionnaire in order that the informants could share their opinions and life experiences related to the decision-making process to use medicinal cannabis as individuals with knee osteoarthritis. Each interview was conducted at a venue chosen by the informants and took approximately 45-60 minutes per session. Each informant was interviewed about 2-3 times. Meeting with each informant would stop when no new information was to be obtained. During all the interviews, participatory observations and audio recordings were conducted.

Data analysis: Data were prepared for analysis by transcribing from the audio recordings of the interviews word for word. Coding was used to identify the informants in the in-depth interviews using ID 1, 2, 3, 4, i.e. 1 means informant group (1 = doctors in modern medicine, 2 = Thai traditional practitioners, 3 = pharmacists, 4 = nurses, 5 = patients with osteoarthritis), followed by 2 to refer to medicinal cannabis use experience (0 = none, 1 = yes), 3 to refer to the orders of the informants in each group, and 4 to refer to the page order of the sample data. For example, ID1- 0 -7- 2 means that the informant was a modern medical practitioner with no experience in prescribing medicinal cannabis who was the 7th informant (in the group of modern medicine) on the 2nd page.

The modified Colaizzi's seven-step method was utilized for the phenomenological data analysis (Colaizzi, 1978) as follows: 1) The interviews were read multiple times so that all the information gathered was understood as a whole, especially the informants' feelings about the occurrences; 2) Each statement was reviewed to find the most relevant significance for the phenomenon being studied; 3) Understand the significance of the phenomenon and define the meaning of every word, word group, sentence, or key concept related to the informant's experience; 4) Determine the meaning of each key word group in order to group the data into categories (Organize the aggregate formalized meaning into clusters of themes); 5) Collect the results of the phenomenon. Write an exhaustive description based on the research objective using

the information and actual experiences of the informants. Cite an example of the informant's speech sample to demonstrate that the information was true; 6) Explain the vague phenomena as clearly as possible based on the factual data and 7) Return to the participants for validation of the descriptions.

The trustworthiness of the findings was regulated throughout the process as follows:

1) To ensure credibility that the findings were truthful and reliable, the semi-structured interview questionnaire was reviewed by the experts before the data were collected. In addition, the researchers had experience in qualitative research as they had participated in several workshops prior to this research project. Data collection was done using various methods concurrently.

2) To ensure dependability that qualitative findings were consistent with the data collected, several methods of data collection were used, and the data collected were then linked together for understanding of the phenomena. Using direct quotes, as well as discussing the results of the data analysis with experts were regulated all along to reduce any bias during the period of data analysis and interpretation.

3) Confirmability was ensured so that the results could be confirmed by others for the sake of objectivity. The interpretations and conclusions were reflected and reviewed by the research team with expert consultations. Member checking was performed to allow informants to check and agree upon the findings as being true to their experiences that they had previously shared.

Data were collected at different locations and on different days and times and then compared. The research results were presented publicly after they were carefully reviewed.

4) Transferability was ensured because a variety of informants were purposively recruited. This research was based on the actual experiences of the treatment providers and the patients in order to obtain comprehensive information. The data provided can be used in further research studies with different informants or in other contexts.

4. Results

Cannabis is in transition from being an addictive drug to medicinal cannabis use under the new policies. This study is a reflection on the perspectives of people and the decision-making of both the care providers and the patients with knee osteoarthritis. As general information about the informants, among 25 informants 52% had experience with medicinal cannabis, 68% were female, and 32% were male. The elements of the decision-making process to use medicinal cannabis of both the care providers and the patients with knee osteoarthritis are as shown in Figure 1.

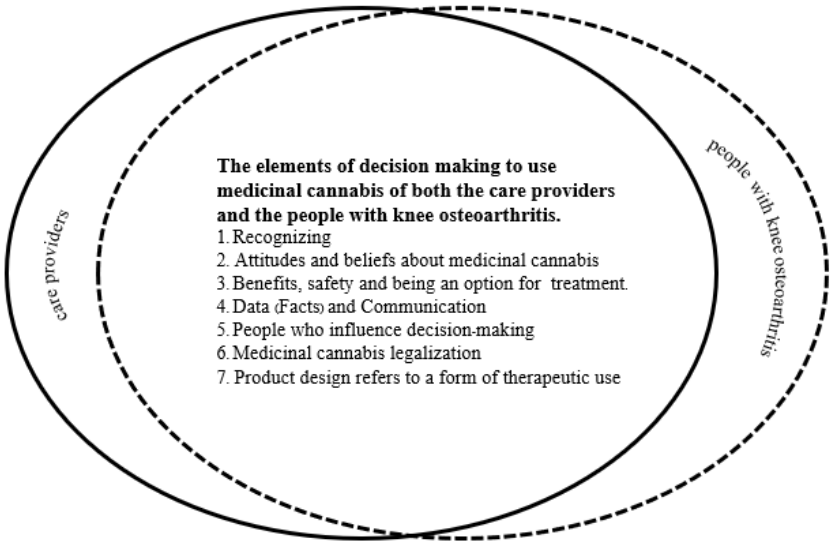

Figure 1 The elements of the decision-making process to use medicinal cannabis of both the care providers and patients with knee osteoarthritis.

From Figure 1, the elements of decision-making to use medicinal cannabis of both the care providers and the patients with knee osteoarthritis can be explained as follows.

1) The need for MC, recognizing the painful nature of osteoarthritic pain and the limited treatment options available means accepting that one suffers significantly from osteoarthritis, especially through the pain and has the desire to get rid of the pain which is the greatest suffering; the pain affects daily life, life is not the same as before.

"*At first, the pain was so bad that I couldn't move my knee joint, I still had pain when walking. (ID5 1 2 1)", "Because people with osteoarthritis know very well that it's painful. It's inconvenient to get up or sit and do anything. (ID5 1 2 4)"*

Pain is a symptom that leads to medical treatment.

"*It gets so unbearably bad that I can't take it anymore, I need to see a doctor. (ID5 1 2 2)"*

When accepting that pain is a problem that needs to be solved, the patient thus seeks treatment or wants to try any options. By using the information from their own experiences, family, acquaintances, advertising media and public relations they were motivated to make the effort to try.

"If this way of treatment doesn't work well again, I will be fine with it. I just want to give it a try thinking that it might work this time. Every time the knee pain gets intense, I desperately don't want anything, I don't want to do anything, I don't want to go anywhere. (ID5 1 4 3)"

Aware of the side effects of painkillers, they sometimes accept the risk just to manage their pain.

"This Brufen (Brufen®) serves as a substitute for the generic name of the drug ibuprofen, which is a painkiller. It can irritate my stomach, so I need to eat a lot of food or drink milk when I take it. NSAIDs can be taken with paracetamol, but I only take them when the pain is too severe. I try not to use them. I take them only once every two months. (ID5 1 1 2)"

In addition, the impact of pain also leads to other problems. For example, when knee pain is severe, it affects their work. Since they can't get to work, no work means no income, leading to economic problems.

"Life gets difficult. I was a vendor standing for a long time. Now I can't do it anymore since standing for a long time is very painful. This knee pain makes me stop working, so I can't make any money. (ID5 1 4 3)"

Knee pain can affect patients' mental health.

"*Before that, there was a lot of pain and I was stressed out. Now it gets better. I'm not too stressed anymore.* (ID5 1 4 2)"

Patients were concerned that they had become a burden to the family.

"*My body is not the same anymore. Family and relatives have to deal with my difficulties, and I feel bad about it. (ID5 0 3 2)"*

Additionally, osteoarthritis can tarnish one's self-image, leading to feelings of embarrassment and a reduced social life.

"I feel embarrassed when people stare at me every time I try to sit down or stand up with difficulty. I used to join meditation practice where we sat cross-legged. Now I can't sit like that anymore. I can't perform ceremonial activities, so I refrain from social activities. (ID5 1 2 3)"

From the perspective of "treatment providers," many expressed empathies, feeling the suffering of their patients. Examples are as follows.

"Knee pain affects people with osteoarthritis in many ways. They come to us when it affects their day-to-day life. The pain makes it hard to sleep and to walk far. It also upsets their work and mental state. They might feel irritated because they are in pain and so they are less productive, and that makes them even more frustrated. It sabotages their self-confidence to socialize with people. They can't squat to make alms giving and to pay homage to the monks. Their daily life among others around them can't be as before. While they make less or no money, they need more to pay for medical care. They are financially weak. (ID1 0 7 2)",

"Pain affects both quality of life and mental health; depression occurs because the patients are unable to work, earn less and end up being a burden to their families. This is a big deal. Furthermore, they have complications from treatment such as perforated stomach, kidney disease or kidney failure from taking some anti-inflammatory NSAIDs. Medication can cause more risks of strokes, heart disease and other consequent expenses. (ID1 1 1 1)"

2) Attitudes and beliefs towards MC from the data reflect the attitudes towards medicinal cannabis through the different experiences of each person. These reflections can be categorized into two groups as follows:

2.1) Belief in the MC's efficacy that denotes informants' positive perception. Positive means medicinal cannabis is medicinally effective. It is a familiar herb. The examples are below.

"It is good because I have tried it. I just massage to heat the knee using 2 drops of cannabis. I do it before bedtime and cannabis aroma evaporates to soothe my nerves. I feel relaxed, joyful, and happy. It seems to put me to sleep, and the pain is gone. (ID5 1 1)",

"Cannabis has been used as a traditional Thai prescription for a long time. There is a belief that it really works. (ID2 1 4 3)",

Many believe that long-term cannabis use is safe.

"In terms of treatment, long-term cannabis use can be helpful from pain to good sleep. It helps cure inflammation, reduces anxiety, as well as skin allergy, skin rash and itchy skin. In addition, it can help with various inflammatory diseases of organs such as hepatitis B or patients with inflammation of different organs such as SLE. (ID1 1 1 2)"

Side effects found are rare and not severe.

"*The patient who applies cannabis oil under the tongue find themselves less stressed, sleeps well and feels less pain. It should be more beneficial than harmful. As far as I know, there were two cases of dizziness and breathlessness. (ID2 1 4 2)"* and

"Actually, we don't have experience yet. I've never used cannabis as a medicine. I've heard and learned that it doesn't seem like a lot of side effects. If we use it carefully, it should help reduce the pain of people with osteoarthritis. (ID1 0 3 3)"

2.2) Attitudes towards MC that show doubt, hesitation, or lack of confidence in MC's effectiveness. These negative attitudes come from the fact that the informants have never actually tried using MC themselves. Some need proven and confirmed trustworthy facts. The examples below come from the fact that the informants have never actually tried it, or they need proven and confirmed trustworthy facts. The examples are as follows.

"A lot of what I have heard is more negative, like people who are addicted to cannabis are psychopaths. It's addictive and dangerous not only to yourself but also to your family and society. And then recently I heard that cannabis has medical benefits. But what makes me feel hesitant is that cannabis can be both beneficial and harmful. How can they extract only the useful substances from it? That's what makes me hesitant. (ID5 1 2 1)"

Being uncertain also comes from a lack of information about the treatment efficacy and dosage. Therefore, decision-making is based on the empirical evidence from the comparison between standard prescription and cannabis use.

"I think, with the right dosage, all substances can be medicinal and useful. The problem is that we still can't figure out the exact amount of substance to be used as a standard. (ID1 1 6 1)"

"*Cannabis is a source of many chemicals, but we need to know which one is going to help with what-- there are many. From what I hear, cannabis seems to be very universal. Yes, it might be omnipotent; but which substance is outstanding for what specifically? How much to use? For example, how much is equivalent to morphine for pain reduction. How much is equivalent to NSAIDs as a painkiller? What about the dosage? We need a complete explanation of how it works. If we know all this information, we can talk about it anywhere. I believe it's really useful, but we have to prove it with empirical data – not just verbal evidence. (ID1 0 7 2)"*

"As a pharmacist, I feel that the products should be clearly labeled with active substances. At least, the doctors and pharmacists will feel more comfortable to consider prescribing it. (ID3 1 1 2)"

Some informants are concerned about the risks of using medicinal cannabis such as drug interactions and addictions.

"*The problem with cannabis is that it has a lot of drug interactions and complications. Suppose a patient takes several medications; there can be a risk of drug interactions and complications. Alternative medicine is very popular among patients in our country. Some of them are given conventional medicine but they don't take it. Many of them don't even tell the doctor about it; they are afraid to get told off (laughing). (ID1 1 2 2)"* and

"I'm afraid of getting addicted. My only concern is that I might be addicted and get high. (ID5 1 4 3)"

"I'm not confident about the safety and effectiveness. If there are other choices that are not

addictive but can help reduce pain compared to standard medicine available, it is something to consider. (D1 0 5 3)"

3) Evidence on efficacy and safety of MC products: Considering cannabis as a viable treatment option.

"If I will decide to use it, probably it is because it's safe, not harmful to my patients. We (doctors) don't use it as a first-line drug as that is what our professors taught us (laughs). Right now, there are two groups of physicians: those who don't believe in it and those who are very interested - but not all the benefits. We are still open-minded about modern medicine. So, we open-minded doctors will weigh both alternative and modern medicine. But those who don't open their minds won't use it at all. This means we open-minded group only consider what is beneficial. If it's risky, we simply don't use it. (ID1 1 2 1)" and

"*We have more options for our patients. In general, we treat insomnia patients with aromatic medicine. Then we happen to have cannabis as an additional option for its outstanding properties to help relieve stress. So, we add it to our prescriptions. (ID2 1 6 1)"* and

"If we consider using cannabis as a supplement, it is because it doesn't cause as many side effects as the conventional medicines. For example, if NSAIDs can't help with a certain dosage, we need to give more and so the side effects will be greater. (ID1 0 3 2-3)"

4) Trustworthiness of information and communication about MC. From the perspective of the treatment providers, data or facts are more crucial for them than those patients with knee osteoarthritis who receive treatment. Empirical evidence is used as a reference. We must ensure the care providers that the decisions they make are efficient and without harm. Examples are given below.

"I would say that cannabis is effective in reducing pain. Yet are there any side effects or what complications can take place? After using it, do symptoms get any better? It should be evidence-based not just word of mouth. Research studies that confirm its efficacy will give us more confidence to consider it. (ID1 0 7 3)"

"We have been taught that what we use must be evidence-based only (laughing). Without it, we do not want to use it. Every drug we use is evidence-based. (ID1 1 2 1)"

"If it is proved to be working, we will definitely put it on the prescriptions. We don't just accept word of mouth. (ID2 1 6 2)"

For communication, there is both word-of-mouth communication or talking and advertising through a variety of channels and other forms of accessible publicity. Information about medicinal cannabis can spread quickly among individuals. This grasps audience's attention and makes them want to try medicinal cannabis. For example, *"Everyone wants to try it because they see the ads. (ID1 0 3 2)"*

Communication from trustworthy individuals holds significant influence.

"Through word-of-mouth publicity, either from friends who have used it before or from acquaintances who have tried it and confirmed that it was good. Publicity in their own community such as community radio is even more convincing because they are familiar and close. These people are the key factor that makes decision-making easier. (ID2 1 1 3)"

This includes the following remark.

"Every patient who visits the doctor wants medicinal cannabis. They learn from online media that it can cure all diseases. (ID4 1 2 2)"

Information and communication have positive impacts; they can make individuals want to try medicinal cannabis. However, there are also some negative effects. Examples are given below.

"News and related information can make people concerned about the dangers of cannabis use. Some people became scared after they saw weed smokers getting high. There is news coverage that features medicinal cannabis *in a negative way, like it will cause brain damage. People who get this kind of information are afraid to use it. We have to consider what the patients think—their opinions and beliefs matter. (ID1 1 1 3)"*

5) Influence from other people: The data collected here reflects how influential people can lead to decision-making about medicinal cannabis use in different ways.

5.1) The patients themselves: The results of their treatment experiences, the views of those close to them, and media influences matter. Below are some remarks.

"I would say 100% of those who come to us make their own decisions because they learn from the media. There may be some recommendations from friends, but online media are more dominant. At the personal level, it is also effective because people's experiences are different. Some people are afraid and don't want to try. Are they afraid of the risk? That depends on personal beliefs. Some say it doesn't work. (ID5 1 1 3)"

"I use it because I saw my grandpa use it when I was young. I saw that it worked well so I gave it a try. (ID5 1 3 2)"

5.2) Friends / people around them:

"...especially senior people. If a friend says it's good, they will believe what they are told. They have more trust in their families or people in their community than in their doctors. (ID4 1 2 4)"

"Friends and family support means a lot here. When the family says yes, they go for it. But if the family says no, they hesitate to use it. (ID2 1 1 2)"

"It has benefits like reducing pain, improving appetite and getting good sleep. This is what I heard from other people—friends, acquaintances, and social media. (ID5 1 2 1)"

5.3) Doctors / Health personnel:

"I saw the advertisement so I consulted with the doctor. The doctor is the person I trust the most. My number 1 is the modern doctor and next to that, Thai traditional medicine—together. (ID5 1 6 2)"

"If the doctor says it's good—effective, I will definitely use it. I don't think too much. (ID5 1 7 2)"

From the perspective of "the care providers/treaters", they are fully aware that they are another factor that influences the patient's decision-making. Some examples are as follows.

"It can be from their own experience, relatives and people around them, the doctors they consult. Like, from their own experience, if they have had the problem for a long time, have tried many different ways, and nothing good happened, they will look for other options—a new choice. If they continue to use the same thing and they still experience the same complications, then there comes a new way—better and safer and no complications, they definitely want this new treatment. (ID1 1 1 2)"

"They are different. Some of them make the decision themselves. Some make decisions because of the people around them. Others can be a friend or a relative or a neighbor who has had that kind of treatment and confirms that it's good. That makes them want it. But in the end, they make the decisions themselves. (ID1 0 5 1)"

The care providers know that the people who are being treated have confidence in them. However, during the decision-making about treatment, the physicians take part in the process. The main principle is to focus on the patient's benefits and safety by providing the information they are confident to give, based on clear academic evidence together with their treatment experience. Eventually, the decision is up to the patients themselves:

"We doctors use our knowledge, beliefs and experience; therefore, we need to provide information about the pros and cons if they use it. Also, we must take part in the decision-making because we are the ones who prescribe. That is both of us (doctor and patient). If the patients want to use it, we know that using it causes more harm than benefit, we know it's not safe for them. Even if they force us, we won't give it to them. (ID1 1 2 1)"

"If the patients want to use it, they should make decisions themselves. Our job as doctors, pharmacists, Thai traditional practitioners or knowledgeable people is to let them know both the benefits and the downsides. We should allow them to choose so that they can accept the consequences. (ID3 1 2 3)"

The information and recommendations provided by the doctors depend on their respective attitude and knowledge, which directly influences what the patients receive. Essentially, if the doctors know many aspects of treatment, it will be a good opportunity for the patients.

"If we have knowledge in other areas of medicine, there will be more choices in referring patients to treatment. But some modern practitioners who have not studied traditional Chinese medicine or have not used traditional Thai medicine, they won't feel that they can suggest this way to the patients. Or they just can't figure out which way to go due to their own treatment experiences. (ID1 1 4 1)"

"To some extent, doctors are obligated to give them advice. It depends on how much the care providers know about cannabis. If they know nothing about medicinal cannabis or what they know is inaccurate, they will dissuade their patients

from using it. But if they get doctors who have both knowledge and experience in this matter, the doctors will encourage them to try it and might provide a lot of information about the experience of patients who have used it, including both domestic and international research studies. (ID1 1 1 3)"

"If the doctors have positive experience in getting good results, any marketing is not necessary. It's still in use; but if it doesn't work at all, it's useless to advertise. The doctors will see it as exaggerated advertising. (ID1 0 3 2)"

6) Legitimacy status of MC denotes both positive and negative impacts of the policy. Data collected show that the policies have a great impact on decision-making.

6.1) The patients feel comfortable meaning they can legally access cannabis products/ services.

"The policy is effective. If it's easy, you can exercise your rights. We want to use it and it's legal now. We are not concerned that the police will arrest us. Once it's announced that it is legal, we are free to use it. (ID5 1 4 3)

Prohibition can be viewed as detrimental rather than beneficial. It is an opportunity for people to be self-reliant.

"Prohibition keeps interested people from growing cannabis for their own use, so they have to buy products from the bootleg market. I don't know if I will get a good or adulterated product. I will support this so that people can become self-reliant. (ID1 1 1 3)"

In addition, it also helps create income opportunities.

"The legalization policy makes communities wake up. They want to participate, to learn and know more, and to use it legally. Think about when people are more confident that they can earn more from cannabis cultivation. This is another factor that supports them to decide to use it. This is because they're confident that medicinal cannabis can help them with other things, too. (ID2 1 3 2)"

6.2) Limited/exclusive access to services/products means insufficient access to medicinal cannabis clinics. Legal medicinal cannabis products are not available publicly for sale. Public demand is so high that people try all means to buy them, especially from the black market.

"*The Ministry of Public Health produced medicinal cannabis products for hospitals under the Ministry of Public Health, but hospitals under the universities have not yet had them. I think it's still not comprehensive in practice. And cannabis is scarcely available. Where can we buy it besides from the black market? So, people turn to the underground economy. (ID1 0 3 3)"*

In addition, the rights to treatment are not equal.

"If in the future, cannabis will not be free, public access will be difficult for people in general as reflected in the current cannabis policy (2021) that medicinal cannabis is free for now. But in the next fiscal year (2022), it must be paid for. That will certainly affect dispensing among patients with different medical rights. Reimbursements are applied only to civil servants while gold card holders cannot have the same privilege. These people will end up receiving just some regular balm. Or else, only patients with more money can afford to use medicinal cannabis. (ID1 1 4 3)"

"In patients with modest medical welfare, including those with gold cards or social security, they will not get to use this treatment. The exception is for patients who are wealthy enough or those on government welfare. Civil servants can access medicinal cannabis using the direct reimbursement track. That's access inequality. (ID3 1 1 2)"

In addition, hospital staff are pressured to achieve a certain number of service recipients to meet the goals set by the Ministry of Public Health. They are apprehensive about the issues of lack of transparency and the concerns about this kind of work might come from political interests behind the scenes. This means common people might be, to some extent, deprived of the benefits meant for them.

"The policy puts some pressure on staff to work on the balance sheet. Now, the numbers we reported were the lowest in the whole country—that's a shame. So, we have to increase the number and therefore it adds to our workload so much that we can't do our best to take care of the patients. It's quite difficult for us to get by. (ID3 1 1 2)"

"*I think it is just politics—they want to commercialize it for politics. Yes, it is used for medical purposes, but it is politics driven. Medicine adds more credibility to it. I believe they plan to turn it commercial and finally common people will not get to access it; they will have to secretly go*

underground and get harmed and come back to our public health system as before. That adds more to our responsibilities. (ID2 1 6 2)"

"I think the people who made us do it try too hard to please people in politics. Like it or not, they can't get away from it. Interests and benefits are so great that they can't leave it alone. (ID2 0 5 5)"

6.3) Lack of readiness of medical cannabis clinic staff and data record systems refers to medical cannabis clinic staff's lack of knowledge and the complicated and unstable data recording systems.

"*There are quite a lot of terms and conditions to prescribe. We need to follow the same tiring steps as morphine. This adds more work to doctors, so they don't want to deal with the prescription steps. But I believe that this trouble will go away if there are pressures or petitions for change to the procedures. In the future, it may be available at 7-11 stores (laughing) so anyone can walk in and buy it like Fathalaijon. (ID1 1 4 1)"*

"The policies matter. For example, the limitations of prescriptions come with many conditions that we have to keep in check such as blood tests and existing diseases. The requirements of data transmission are redundant. Instead of submitting a single file to both the central office and the hospital, we need to submit different forms. I don't know what they really want. It's not clear. (ID2 0 5 5)"

"*There has been a problem with data entry to be submitted to the Ministry. At first, we used the Ministry's program. We were later asked to use a different one and the problem was that we couldn't enter any data. The program has been broken since July 2021. So I have to record the data on paper. (ID4 1 1 2)"*

"*We work with a lot of challenges. It is quite risky, and I have to be a mentor to other colleagues too. We have no experience and we're not very confident in what we are offering to the patients. (ID3 1 1 3)"*

7) Product design~~s~~ refers to a form of therapeutic use that covers both color and scent. Both groups of informants reflected that product design affects their decision to use MC as follows.

7.1) External use: The reason is that it is most likely to be safe for users.

"*Osteoarthritis is ideal because it is for external use so it is safe and convenient to use. (ID5 1 2 5)"*

7.2) Sublingual drops: The reason is that it will be more effective than external use.

"In my opinion, the external use won't work. For osteoarthritis, even topical NSAIDs have not been effective. I think sublingual drops will work better. (ID1 0 3 3)"

Some patients did not like sublingual drops because it is hard to control the dripping. They were concerned about the dangers of getting an overdose.

"I don't want to prescribe sublingual drops because it's difficult to be exact when applying. We don't know if the elderly have good enough eyesight. If they accidentally take more than two drops, they might have chest tightness. It's dangerous. (ID2 0 5 4)"

7.3) Both sublingual and transdermal drops can increase the effectiveness of synergistic effects.

"Apart from external use, you can add sublingual drops too. The patients will sleep soundly. Their immune systems will get better too. (ID1 1 1 1)"

"If the pain is chronic, you should apply both external use and under-the-tongue drops. Applying only one way will not be enough. (ID2 1 4 5)"

7.4) Capsules and tea: *It is convenient and easy to control the dosage.*

"Products in the forms of capsules or tea are safer for the elderly because the concentration is low. This should be good for the elderly in terms of temperament and better sleep. (ID1 1 4 7)"

7.5) Scent affects the good feelings, such as

"Even the scent matters. This lot of the product stinks. The patient can't stand it. Work on the scent so that the patients can handle it. (ID1 1 4 7)"

7.6) Colors: Currently hemp oil products are dark in color, and they stain clothing after applying/massaging.

"It would be nice if it's a clear color. The one I'm using now is black and it leaves stains on my clothes. (ID5 1 2 5)"

5. Discussion

The research objective was to study the decision-making experience of medicinal cannabis use from the perspectives of care providers and

patients with knee osteoarthritis. The results of the study revealed 7 key elements in the decision-making process to use medicinal cannabis. These elements will be discussed below.

1) The need for medicinal cannabis (MC) arises from recognizing the painful nature of osteoarthritic pain and the limited treatment options available: As a person realizes that pain is a problem, acceptance is an important factor in their decision-making. "It is considered as motivation which refers to the drive that compels the person. Motivation is based on necessity. Without necessity, there is no motive, which motivates a person to act or do something. Motivation originates from within individuals, but it may be affected by external factors (Kotler, 2000). For example, seeing public relations or advertisements via online media, and television causes a feeling of desire to use as self-treatment. Learning from friends with osteoarthritis who used it and their pain reduced, one might want to experience the same feeling of relief as well, etc. When people with osteoarthritis are aware of the problem, and if the problem isn't deemed serious, they might not try hard to address it. But if the problem does not go away or it keeps coming back and even gets worse, it will become a driving force to find a new solution. Motivation that arises within human beings can be regarded as a need. Because pain is the main symptom of osteoarthritis, it causes the patients to suffer. From a survey of 20 cannabis clinics in 5 provinces in Canada, chronic pain was found to be the first symptom that made patients decide to seek treatment (79%), followed by insomnia (40%) and anxiety (34%) (Cyr et al., 2022). Likewise, online surveys of people with chronic pain have shown that the use of cannabis for pain relief has been found to be the most clinically useful (Piper et al., 2017; Sexton et al., 2016). In Thailand, a prospective observational cohort study has been conducted at 22 sites in 18 provinces of 13 regions of Thailand, and they found that one of the three factors that brought the patients to see the doctors was pain (Stienrut et al., 2020). Due to the chronic course of the disease, ongoing treatment is required. In addition, the time spent by patients and caregivers results in loss of income for both patients and caregivers. Because they cannot work to earn a living, they become a burden on the family and the government (Losina et al., 2015; Peungsuwan et al., 2019). This affects the patients' mental health and social activities (Litwic et al., 2013). In addition, patients are also exposed to risks and harm from seeking treatment in a variety of ways. In particular, treatment with NSAIDs, one of the most commonly prescribed medicines, can lead to several complications (Bindu et al., 2020).

2) Attitudes and beliefs towards MC: This element refers to a feeling of like, dislike, or a positive or negative feeling towards cannabis products. Positive or negative feelings arise from receiving news or information about a product. It might come from a person's thoughts about how that trademark came about. If the product information is received about the trademark in a positive way, there will be positive feelings towards the product. On the other hand, if one receives negative information and feels negatively about it, they will develop a negative perception of the product. A person's attitude towards the product will influence his/her determination to continue using the product (Kirnan et al., 1989). The attitudes found in this study were based on previous experiences that the patients had and heard from acquaintances and online media. It was found that most of the patients had a positive attitude and believed that cannabis would help them recover from the pain because it is a natural, harmless herb. From a study of patients at trauma centers in Massachusetts, 78% of patients believed that cannabis could be used to treat pain, followed by anxiety (62%), and 60% of them had used cannabis at least once before. Moreover, among those who used cannabis during their recovery, 90% believed that it could reduce pain and 81% believed it could reduce the amount of opioid they were using (Heng et al., 2018; Piper et al., 2017; Rochford et al., 2019). Physicians' pre-existing attitudes about medicinal cannabis were another driving factor that supports the willingness of physicians to recommend medicinal cannabis to people (Newhart, & Dolphin, 2019).

For the indecisive group, there were mixed feelings, both positive and negative. They were not sure about the efficacy and safety due to the unclear amount to be used, potential for extraction of beneficial substances, complications from use, and a long-time impression of cannabis as an addictive drug. Some of them have never actually tried it themselves, so they needed verification with trustworthy facts. This finding is consistent with the qualitative study of physician perceptions of medicinal cannabis, in which data was collected from 24 physicians showing that physicians were in

disagreement in identifying medicinal cannabis as a drug and a non-drug. Compared to biomedical standards, medicinal cannabis is seen as a drug, but the common point is the use of medicinal cannabis as a therapy in combination with a new standard drug in palliative care. Doctors emphasized their positive experiences with the medicinal cannabis and recognized its limitations (Zolotov et al., 2018).

This suggests that knowledge and facts about medicinal cannabis should be reviewed and communicated more, especially on the part of the physicians. This is because they can influence decision-making and prescribing. These doctors put their trust in clear empirical data. Medical care providers generally believe that medicinal cannabis is a legitimate medical treatment. Yet, there are gaps in the knowledge of the caregivers regarding the efficacy of medicinal cannabis, clinical experimental data, and drug interactions. They need the information to use for clinical decision-making (Philpot et al., 2019).

3) Evidence on efficacy and safety of MC products: Upon considering cannabis as a viable treatment option, potential users agree that medicinal cannabis can help reduce the use of widely-used modern painkillers, which undoubtedly pose risks of complications. The results of the two informant groups reflected that medicinal cannabis is helpful and safe. This finding is consistent with that of online surveys in people with chronic pain; medicinal cannabis has greatest health benefits regarding pain relief (Piper et al., 2017). The value of pain reduction is greater than the risk (Mücke et al., 2018; Zeng et al., 2021). Therefore, medicinal cannabis is an important treatment option to reduce the reliance on widely-used modern painkillers, which carry significant risks of complications.

Because interest in the use of cannabinoids as an adjuvant therapy for pain management has increased in the past decade, both patients and care providers want more empirical evidence about the benefits and risks of medicinal cannabis use. The notable limitations of the previous studies included the short period of treatment, heterogeneity, small patient populations, testing methods of different cannabinoids, different amounts and interactions between cannabinoids, use of different performance endpoints, as well as slightly observable results. Side effects of short-term medical cannabis use are generally found moderate to mild, well-tolerated and transient. However, there is little information about the long-term safety of medicinal cannabis use (Vučković et al., 2018; Wilsey et al., 2016). It is crucial for healthcare providers around the world to stay updated with accurate information about the benefits and risks of using medicinal cannabis. Providing both doctors and patients with precise data is essential for informed decision-making.

4) Trustworthiness of information and communication about MC: This study found that both care providers and patients wanted reliable information, in particular, empirical evidence on the benefits and risks of cannabinoid use. However, care providers seem to be more enthusiastic about the reliability of the information. In addition, the acceptable information or facts must have clear empirical evidence; it should be substantiated and well-documented. Trustworthy information is the most important thing that encourages treatment providers to feel confident in decision- making to prescribe (Philpot et al. , 2019) . However, the information and recommendations from the doctors depend on their own attitudes and knowledge. Therefore, what the patients receive from their doctors is directly influenced by the pre- existing attitudes towards medicinal cannabis that the doctors have, and so it is another driving factor that affects the willingness of physicians to recommend medicinal cannabis (Newhart, & Dolphin, 2019).

5) Influence from other people: The results of this study reflect that the people who influence the decision to use medicinal cannabis are diverse, either themselves, friends or acquaintances, doctors or medical personnel. This finding is consistent with some previous studies which showed that patients' use of medicinal cannabis for chronic pain is influenced by both positive factors (e.g., friends and family support) and negative social factors (stigma surrounding cannabis use) (Mücke et al. , 2018; Philpot et al., 2019; Zeng et al., 2021; Zolotov et al., 2018) . Even though doctors are authorized to prescribe treatment, this study found that it was a shared decision between the patients and their physicians. Doctors share evidence-based information about the benefits and risks of medicinal cannabis with their patients, presenting the information with confidence. Physicians' pre-existing view of medicinal cannabis is a driving factor that affects the willingness of physicians to recommend medicinal cannabis (Newhart, & Dolphin, 2019) . Patients are willing to try it if the doctor prescribes it. The lack of confidence among physicians and therapists in the effectiveness of medicinal cannabis is partially due to insufficient

knowledge in this matter. This finding is consistent with a study that found that healthcare practitioners often believe that medicinal cannabis is a legitimate medical therapy. However, there are gaps in care providers' knowledge about the effectiveness of medicinal cannabis in terms of dosage, contraindication and limitation in application, and accurate information about drug interactions. Such data should be more widely disseminated among healthcare providers to assist in their clinical decision-making (Philpot et al., 2019). As for the patients themselves, there are different attitudes and beliefs in relation to the experience gained. Therefore, it is possible that the patient's decision-making is encouraged by the processing of information received from family members, friends or acquaintances, as well as the doctors that they consulted. And the patients themselves are the persons who make the final decisions. Therefore, the clinical factor that the care providers should consider when discussing medicinal cannabis is the extreme unpredictability of the patient's values and preferences. This issue should be considered when care providers and patients make decisions together (Zeng et al., 2021).

6) Legitimacy status of MC: This study refers to both the positive and negative impacts of the MC-related policy. Recently, there has been a growing debate about the use of medicinal cannabis in many countries regarding legalization of medicinal cannabis usage. Some countries have also legalized the recreational use of cannabis (Vučković et al., 2018).

On a positive note, patients feel at ease to use it now, because access to medicinal cannabis is easy. This means medicinal cannabis can be used legally with administration standards. In the past, many patients applied medicinal cannabis without prescriptions; they purchased cannabis products within their own circle of friends and acquaintances, mostly underground. They kept their medical history legally clean because the medicinal cannabis status was not yet legalized. Now that medicinal cannabis treatment is allowed by law, people are motivated and convinced to decide to use it (Zeng et al., 2021). As mentioned in some studies, there have been legal limitations and cautions of the quality of medicinal cannabis; patients need to receive treatment in government hospitals (Martell et al., 2018; Singh et al., 2019).

The negative impact is concerning access to medicinal cannabis products/services. This is probably because Thailand has recently legalized medicinal cannabis in 2019. There are currently few medical cannabis clinics. More importantly, no legal products are available for sale. In other parts of the world, access to cannabis for medicinal and research purposes are still restricted by governments (Sexton et al., 2016). Medicinal cannabis clinic staff are pressured to increase medicinal cannabis users in order to meet the criteria set by the Ministry of Public Health. In addition, there is a concern that there may be political interests behind the legalization of cannabis and that in the end, people in general may not have access to services and products like before. This finding is in line with problems in the United States where medicinal cannabis is legal in some forms in 47 states, 3 state territories, and the District of Columbia. There is also an inequality by state laws. There are significant social and health inequalities regarding access to medicinal cannabis (Ryan et al., 2021).

In addition, the study found that medicinal cannabis clinic practitioners and staff were not well prepared. The data recording system is problematic and unstable. Even though the interest in using cannabinoids as supplemental treatment for pain management has increased throughout the past decade, preparation in practice has not been completely inclusive. In particular, nursing staff who are positioned in the front line in providing services revealed that they have not gained related knowledge and received proper training regarding medicinal cannabis. With no experience nor comprehensive understanding, they feel insecurity and lack confidence to perform their work. Feeling inexperienced and underprepared certainly has an impact on the performance of their duties.

7) Regarding product designs or forms, most informants in the study emphasized the safety of medicinal cannabis products. The products can take the forms of cream, lip balm, shampoo, lotion, salve or dermal patch. However, Ryan et al. (2021) states that human studies are rather rare. The transdermal form has fewer negative effects than other forms on health and most of these options are currently still in laboratory or animal studies. Some informants wanted cannabis products for oral administration such as sublingual drops because it takes effect faster. Currently, this product form is prevalent in Thailand because it is used to treat a wide range of symptoms such as insomnia, pain and epilepsy (Yangsud et al., 2021). Other previous studies also

showed that applying simultaneously more than one form of medicinal cannabis has been a common practice (Boehnke et al., 2019). Patients who refused to use faster-acting inhalation and injection forms were concerned about the side effects. Cannabinoids may have different side effects depending on the product form, the dosage taken, and the proportion of cannabinoids to other active ingredients. In addition, individual users can have different responses regarding their experience, sensitivity, tolerance and drug combinations or polypharmacy (Boehnke et al., 2022).

The price differences between licensed and unlicensed is frequently cited as a factor influencing purchasing decisions. Product features and qualities (e.g., size, color, or moisture content) as well as social influences also play a role in purchasing decisions (Rice, & Cameron, 2018).

Limitations:

Since the results were extracted from a limited number of informants whose experiences and opinions might not be sufficient to offer a clear understanding and propose clinical guidelines for cannabis management, future quantitative research is needed. In the meantime, the results in this study can be used as an important starting point for discussions on MC-related issues and concerns. The 7 themes found in this study can be simplified, revised or modified when more evidence and assertions are substantiated and verified.

6. Conclusion

The study findings unveiled 7 essential elements influencing the decision to utilize MC. The primary element of utmost significance is the requirement for pain relief in individuals with knee osteoarthritis. These patients must unequivocally possess the necessary needs for MC to alleviate their symptoms. Additionally, the effectiveness of MC and its legal status are significant factors to consider. Conversely, the remaining four components hold lesser importance or are not pivotal in the decision-making process for MC utilization. Therefore, policies pertaining to MC should address these factors accordingly.

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