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MEDICAL CANNABIS IN MALAYSIA: SUPPLY AND DEMAND ON FACEBOOK

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ABSTRACT

The internet has become a key hub for communication and information, including drug-related information. Evidence from other nations suggests that medical cannabis is also available online. Yet little is known about medical cannabis dealing on online services in Malaysia. This study examines the current supply and demand of medical cannabis on Malaysian Facebook Pages. Researchers searched for cannabis Facebook Pages in Malay and English between April and June 2022, using the keywords associated with cannabis and marijuana in popular search engines. The Facebook content, including the posts and users' responses to supply and demand information for medical cannabis, were screened and analysed. Subsequently, the contents of the Facebook Pages were categorised into five themes: (1) demand for medical cannabis; (2) testimony; (3) supply information; (4) adverse health effects of medical cannabis; and (5) product types and routes of administration. The findings indicate that medical cannabis is available online and searchable via popular search engines, despite being illegal in Malaysia. A total of 46 Facebook Pages related to cannabis were identified in this study, where 13 pages sell medical cannabis directly, and 3 sell both medical and recreational cannabis. In addition to private messages via Facebook Messenger, most pages share contact details. The information on the sampled Facebook Pages reflected the growing demand and illegal sales of medical cannabis in Malaysia via online platforms since 2012. Thus, there is an urgent need for proper regulations and laws

to control medical cannabis usage besides protecting patients against potentially harmful medical cannabis online.

Keywords: medical cannabis, cannabis legalisation, Facebook, drug policy, marijuana, supply and demand

INTRODUCTION

Technology advancements offer the public access to limitless information on the internet from health, medication to various healthcare products, with just a few clicks. The statistics showed that Malaysia had 30.25 million social media users and 29.55 million internet users in January 2022 (Kemp 2022). Over the last decade, the internet has evolved into a key hub for communication and information, including drug-related information, illicit prescription drugs and illegal drugs (Hanson et al. 2013; Shutler et al. 2015; Thompson, Rivara and Whitehill 2015). According to Demant et al. (2019), social network is a widely utilised medium for selling and purchasing illegal narcotics in Denmark, Sweden, Finland, Iceland and Norway, despite the differences in the legal and sociocultural background of each country. Despite having similar societies, Nordic countries differ regarding drug legislation. Earlier studies have reported that the supply and demand of cannabis are available online, and consumers can purchase the products for medical use and alternative treatment at their convenience (Cavazos-Rehg et al. 2016; Pinyopornpanish et al. 2018; Thaikla et al. 2018). Similarly, Malaysian internet users searched for information relating to cannabis via social media platforms (Hadirah and Noor Munirah 2019).

Studies on online information on cannabis, opiates, and kratom have been conducted in other countries in the past (Cavazos-Rehg et al. 2016; Demant et al. 2019; Pinyopornpanish et al. 2018; Thaikla et al. 2018), but little is known about the supply, demand and medical cannabis use through social media platforms in Malaysia. The literature only studied public opinion on the medical cannabis controversy by analysing the content of selected Facebook pages related to medical cannabis in Malaysia (Hadirah and Noor Munirah 2019). The study findings demonstrated that the attitude of Malaysians towards medical cannabis usage has also improved in recent years (ibid.). Despite some Malaysians considering cannabis dangerous and taboo, there is a certain extent of acceptance of it for medical purposes.

Cannabis Sativa is a therapeutic plant (Fitzcharles et al. 2019) that contains more than 750 compounds. Some of the most studied chemical compounds are cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC) (Abuhasira, Shbiro and Landschaft 2018; Fitzcharles et al. 2019). The main psychoactive component of cannabis is THC, which is responsible for the intoxicating effects. On the other hand, most medical benefits of cannabis are derived from CBD, which is not psychotropic and has no adverse effects on memory or motor skills (Pisanti et al. 2017). There are two classes of Cannabis Sativa: hemp and marijuana (Qatanani, Umar and Padela 2021; Russo 2007; Thomas and ElSohly 2016). Hemp has a lower or non-existent THC (< 0.3%) and a higher CBD content; hence, an ideal source for CBD medications. In contrast, marijuana has a lower CBD content and higher THC, causing users to feel high, hallucinate, or experience euphoria. Nevertheless, both Cannabis Sativa components are useful for therapeutic purposes. In this study, medical cannabis refers to marijuana and hemp extracts used for therapeutic purposes (Qatanani, Umar and Padela 2021).

To date, cannabis remains illegal in Malaysia, even for medicinal uses. A person who possesses cannabis, regardless of the purpose, will be punished by the law, including fines, imprisonment, or whipping. Meanwhile, cannabis trafficking offences may entail the death penalty or life imprisonment. Therefore, desperate patients go online for information about cannabis and find a dealer who can supply them with medical cannabis. Several studies have analysed users' behaviours by examining their interactions relating to cannabis on social media platforms (Cavazos-Rehg et al. 2016; Demant et al. 2019; Pinyopornpanish et al., 2018; Thaikla et al. 2018; Thompson, Rivara and Whitehill 2015). For instance, Facebook is a prominent forum for openly discussing substance use habits (Thaikla et al. 2018; Thompson, Rivara and Whitehill 2015), providing the appropriate data for substance use epidemiological research (Demant et al. 2019; Pinyopornpanish et al. 2018; Thaikla et al. 2018). Furthermore, Facebook is popular among Malaysians as the platform allows potential buyers and sellers to communicate, share information, and exchange contacts conveniently (Statista Research Department 2022).

Around 800 patients buy medical cannabis illegally through Facebook Pages (*Free Malaysia Today* 2018; Coconuts KL 2018). In the case of *Muhammad Luqman bin Mohamad v. Public Prosecutor 2021 4 MLJ 494*, and *Public Prosecutor v. Amiruddin Nadarajan Abdullah* (High Court of Klang Malaysia, 20 February 2019), the people purchased cannabis oil from the accused through Facebook. These cases demonstrate the existence of a supply and demand chain for medical cannabis in the online marketplace in Malaysia. Consequently, the Malaysian government has been considering granting access to medical cannabis in recent years. Therefore, this study examines the current supply and demand of online

information about medical cannabis on Facebook in Malaysia by reviewing the content of posts and comments by Facebook users and categorising their content into five themes. Facebook was chosen because the platform boasts 21.70 million users in Malaysia (Kemp 2022). Therefore, Malaysians and other users residing in Malaysia use Facebook as the most common social networking platform. These content analysis findings may shed some light on the necessity of allowing patients access to medical cannabis in Malaysia. In addition, the findings could help put the present medical cannabis legal ambiguity into context and highlight the importance of monitoring and regulating medical cannabis in Malaysia.

Although this review and analysis possess commendable strengths, it is crucial to consider certain limitations when interpreting the presented findings. First, the search for Facebook Pages was limited to Malaysia and those available in the Malay and English languages. As a result, the count of posts containing hashtags might have been underestimated since it excluded pages in other languages, such as Mandarin, Hokkien, Cantonese, or Tamil, which are also prevalent in Malaysia and accessible to users.

Additionally, this review focused primarily on analysing posts, comments and testimonies found on Facebook Pages up until 17 June 2022. Consequently, our study did not examine comments and testimonials exchanged on Telegram, which could potentially contain valuable insights regarding the benefits and adverse effects of CBD oils and medical cannabis for users.

METHODOLOGY

This qualitative study adopted the content analysis approach for data analysis. The researchers manually browsed websites daily by inserting terms related to medical cannabis or marijuana into popular search engines, including Google, Microsoft Bing, and Yahoo in Malay and English from January to May 2022 (see Table 1). The web pages were selected following the methods of previous studies (Pinyopornpanish et al. 2018; Thaikla et al. 2018). Furthermore, other keywords, such as street names or slang of ganja, cannabis, or marijuana, were utilised in the search process. New terms discovered during the initial search were also used for a more extensive search. Table 1 provides the descriptions for each term. The first 200 results were examined for each search, and relevant Facebook accounts were shortlisted for further analysis. Moreover, the Facebook.com search tools were utilised in the search process (e.g., *ganja perubatan* site: Facebook.com) and recorded the selected Uniform Resource Locators (URLs) and pages. Additionally, the number of followers on each page was recorded to estimate the popularity

of the page. New Facebook Pages discovered daily were accumulated, and the duplicates were removed. Subsequently, the researchers reviewed the Facebook Pages content for information about supply and demand. The Facebook page was regarded as a source of supply and demand data for medical cannabis in Malaysia if at least one of the following characteristics was present in the posts and the users' comments:

1. The testimony on the medicinal benefits of cannabis by previous users, which may help persuade customers to future purchases.
2. Information on dosage and administration of medical cannabis for new buyers.
3. Marketing of medical cannabis products, including price, types of products, contact details, or any means of communication that allow consumers to obtain more information from the sellers about their products.
4. Information about the adverse health effects of medical cannabis on the users.

Table 1: Keywords in Malay language and English utilised for the search process on popular search engines (Microsoft Bing, Google and Yahoo)

Drugs	Keywords
Cannabis/marijuana	In Malay: Ganja perubatan Malaysia; ganja Malaysia; kanabis Malaysia; minyak CBD Malaysia; bani tenang Malaysia, hem Malaysia; minyak hem Malaysia, minyak hemp Malaysia; minyak kanabis Malaysia; minyak ganja Malaysia; kanabis perubatan Malaysia; minyak cannabidiol Malaysia, ganja herba Malaysia; produk CBD Malaysia; tenang is good; sahabat tenang. In English: Cannabis Malaysia; CBD oils Malaysia; marijuana Malaysia; weed Malaysia; Hemp Malaysia; hashish Malaysia Facebook; medicinal marijuana Malaysia; stoner Malaysia; hash Malaysia; Malaysia weed; Malaysia Cannabis; 420 Malaysia; marijuana Malaysia; medical marijuana Malaysia; Medical cannabis Malaysia; medicinal cannabis; Malaysia marijuana; Mary Jane Malaysia; CBD products Malaysia.

The researchers employed similar approaches from previous studies that evaluated and extracted information from websites selling illegal drugs online (Pinyopornpanish et al. 2018; Hillebrand, Olszewski and Sedefov 2010). In

addition, this study focused solely on Facebook Pages since this platform is the most popular social network in Malaysia.

A research team conducted a content analysis of the posts on 38 Facebook Pages pertaining to cannabis in Malaysia up to 17 June 2022 (see Appendix: Table A). After the screening process, 26 Facebook Pages were selected based on the criteria of supply and demand information (see Appendix: Table A). The 50 most recent posts on Facebook Pages and the 50 most recent comments on each post were extracted independently by all researchers. Two researchers (EK: Ekmil Krisnawati Erlen Joni and RN: Rohaida Nordin) independently classified the first 50 posts and worked together to conclude the first 50 posts. A third researcher, SMI: Shahrul Mizan Ismail, was consulted to resolve any discrepancies. The research team analysed the post and comments using a thematic approach and categorised the data into five themes (1) demand information; (2) testimony; (3) supply information; (4) product types and route of administration; and (5) adverse health effects, adapted from Pinyopornpanish et al. (2018).

Posts or comments inquiring if cannabis can be used as a treatment for certain diseases are demand information. Meanwhile, comments or posts that explain the user's experience with the medicinal benefits of cannabis would be categorised as testimony. Posts or comments detailing the price and types of the product, contact information or any method of communication and marketing information would be classified as supply information. Furthermore, users' comments or posts on how to use medical cannabis products and the frequency were placed under the product types and route of administration theme. Finally, posts or user comments explaining the harmful effects of consuming medical cannabis products were classified as adverse health effects.

A total of 46 public Facebook Pages related to cannabis or marijuana in Malaysia were found in the initial search process. These pages advocated for the medical and recreational use of cannabis while selling cannabis or hemp products. If the pages did not provide any information stated above (inclusion criteria) or sell cannabis for recreational purposes only, without giving any information related to medical cannabis, the researchers would exclude the pages from the analysis. After the screening process, only 26 Facebook Pages were selected for this study (see Appendix: Table A). Thirteen Facebook Pages sell medical cannabis directly to the public (FB1 to FB13), and one page promotes growing cannabis and teaches the public how to grow cannabis (FB14). Meanwhile, FB15 and FB25 use their pages to sell recreational cannabis and as a platform for members and administrators to share information on the supply and demand of medical cannabis. In addition,

eight Facebook Pages promote both recreational and medical cannabis, while another five focus on promoting hemp and CBD only.

The data collected from the Facebook Pages indicated that the supply and demand for medical cannabis information in Malaysia began in 2012. Only one supplier has an approved license from the United Kingdom (UK) to sell CBD products certified by the Medicines and Healthcare Products Regulatory Agency (MHRA) and the UK Food Standards Agency (FSA) (FB3 to FB6). On the contrary, the remaining suppliers were not licensed to participate in the sales of any cannabis products. Most Facebook Pages have many followers and likes, suggesting that Malaysians are aware of the medicinal properties of cannabis and are interested in buying the products. The number of pages selling medical cannabis in Malaysia remains limited and illegal.

RESULTS AND DISCUSSION

Thematic Analyses of Posts and Comments from the Administrators and Users

The content analysis of 50 posts and comments on the selected Facebook Pages was performed and categorised under five themes: (1) demand information; (2) testimony; (3) supply information; (4) product types and route of administration; and (5) adverse health effects.

Theme 1: Demand information (questions about types of disease that can be treated with medical cannabis)

The posts and comments in this subtheme are mainly inquiries from the public to the administrator or other users about cannabis as a cure for certain diseases, either for themselves or family members. Appendix: Table B demonstrates the public's demand for cannabis as medicine and their inquiries for affirmation and testimonies from other users. In addition, some users enquired about obtaining medical cannabis in Malaysia or requested the administrator to send them more information about medical cannabis products via private message. In summary, these posts indicated the public interest and demand for the medical usage of cannabis in Malaysia, regardless of the illegality of the products under the Malaysian Dangerous Act 1952 (Act 234).

Appendix: Table B illustrates the urgency of some patients or family members in searching for medical cannabis products. Most questions were directed to the

administrator or other users on obtaining medical cannabis products or CBD oils for specific illnesses. Furthermore, the highest demand for cannabis products was from cancer patients. For instance, some users admitted to having stage four cancer and require medical cannabis urgently by using phrases such as, "Please message me. I want to know about it. Urgent", "Hi, I have messaged you. I require medical cannabis on an urgent basis", and "Please get back. Thanks". Some cancer patients also asked for Rick Simpson Oil (RSO), which originated from the marijuana plant. The RSO is unique because the oil contains highly potent THC that offers promising efficacy (Singh and Bali 2013). Moreover, studies have reported the benefits of RSO in cancer therapy and other chronic health conditions, like multiple sclerosis and asthma (Braun et al. 2020; Singh and Bali 2013).

The data also indicated the demand for medical cannabis products to treat various illnesses (Appendix: Table B). The patients or their family members believe that medical cannabis is an alternative or traditional treatment for different diseases. Nonetheless, some patients lack knowledge of the medicinal properties of cannabis; thus, entirely relying on the seller's information and testimonies from experienced buyers (Appendix: Table B and Table C). For example, one user asked the seller whether medical cannabis could cure syphilis (FB5). The seller responded that none of his customers had used cannabis for that purpose and urged the buyer to try the product. Medical cannabis is illegal under Malaysian law; patients have to use medical cannabis products without a proper prescription or medical advice, which could be harmful in case of adverse reactions. Conversely, the patients can get advice from a licensed doctor on the suitability of medical cannabis for their treatment if medical cannabis is legalised in Malaysia.

Theme 2: Testimony

Previous studies have reported that Facebook Pages provided information on the benefits of medical cannabis by sharing links to research or news from other countries with their users (Demant et al. 2019; Thaikla et al. 2018). Nevertheless, this study focused on the testimony of Malaysians who are experienced medical cannabis users, which can be divided into two categories. Firstly, the seller who posted the testimony on the Facebook Pages by showing the screenshot of communication with satisfied customers to convince potential buyers to purchase their product. The second type of testimony is comments from medical cannabis users who shared their experiences by responding to new users' questions. Appendix: Table C shows the users' testimonies on the benefits of medicinal cannabis.

Most patients shared how medical cannabis improved their quality of life. For example, a patient with stage two nasal cancer used cannabis to regain his health

and claimed that the doctor had confirmed he was now cancer free. Similarly, a patient who suffered from depression and insomnia testified that medical cannabis improved his mood, sleeping pattern, and focus at work. The testimonies supported earlier studies that revealed medical cannabis' benefits in improving an individual's quality of life, a medicine for the mind, and life-preserving characteristics (Bottorff et al. 2011; Erridge et al. 2021; Haroutounian et al. 2016; Pritchett et al. 2022; Safakish et al. 2020). Despite that, not all users achieved the desired result. For instance, when one user shared how medical cannabis cured his insomnia, another responded that the product did not work for her. Nonetheless, using medical cannabis helped her feel relaxed and reduced the pain that resulted from a broken leg.

Most patients use medical cannabis to supplement the treatment they receive from the hospital. Conversely, some patients claimed to have replaced their treatment with cannabis and have since stopped receiving treatments from the hospital. For instance, a father testified to using medical cannabis for his daughter suffering from a brain tumour and stopped medication from the hospital. His daughter, who previously could not walk, was now healthy, and the medical report stated that the tumour was shrinking. Meanwhile, another user stopped his medical treatment for epilepsy after consuming cannabis oil. Based on the content analysis, it can be concluded that improving the patient's quality of life motivated them to use medical cannabis as an alternative treatment. This finding is consistent with previous research where patients use medical cannabis as a substitute for prescription medications or in combination with their current treatment, leading to improved quality of life (Mercurio et al. 2019; Pritchett et al. 2022).

Reading the testimonies posted by the sellers or experienced users may influence consumers' decisions in trying and continue using medical cannabis. This data is vital for local policymakers to fund and conduct more research and clinical trials on the effectiveness of medical cannabis for patients in Malaysia. The findings of this study are limited to self-reporting and require validation before the Malaysian government decriminalises or legalises medical cannabis.

Theme 3: Supply information

Most sellers include their contact information on their Facebook Pages for potential consumers to contact them for further inquiries. Moreover, potential buyers can choose to private message the sellers through Facebook Messenger or other applications, such as WhatsApp and Telegram (six Facebook Pages). Some pages have Instagram accounts, but the sellers are more active on their Facebook Pages than on Instagram. For example, two (FB24 and FB26) out of three pages

(FB26, FB24, FB23) offered medical and recreational cannabis and promoted the latter on Telegram by sharing pictures and videos of their cannabis as a marketing strategy. Notably, sellers refuse to sell medical cannabis via cash and delivery and prefer mailing the products to the buyers. On the contrary, some sellers are willing to meet up with their clients or set up a place to drop off recreational cannabis.

Some page administrators have been blocked by Facebook (FB9 to FB13), but they created new pages and updated contact details for potential buyers to contact in the comments section. Furthermore, active members often share the sellers' contact information with new and potential users in the comments section. These members also inform users that sellers cannot respond to private messages and should be contacted directly through WhatsApp. Additionally, some sellers posted attractive offers on their Facebook Pages, such as "buy one free one" (FB7 and FB8) and providing discounts of up to 30% for year-end sales (FB3 to FB6). Finally, two Facebook Pages stopped selling medical cannabis (FB12 and FB13) because the police arrested the administrator, and the supplier could not procure ample supply for their users.

Theme 4: Product types and route of administration

Potential buyers are widely exposed to product details on most Facebook Pages. Furthermore, some pages offered medical and recreational cannabis (buds, dab, hash, brick weed, vape cart, bong), along with merchandise, such as lighters, and illustrated T-shirts of cannabis leaves. Despite the wide product offering, a few Facebook Pages (FB7, FB8, FB9, FB10, FB12, FB13 and FB14) displayed the price; thus, necessitating potential buyers to contact them personally. Consequently, the researchers contacted them via WhatsApp and joined their Telegram channels to obtain more information about the products and prices. Numerous medical cannabis products are available in the market, ranging from CBD oils, cannabis oils, hemp seed oil, hemp seed capsule, e-liquid for vaping, CBD gummies and lollipops for children, gummies for adults, hemp soap, CBD balms, skin treatment cream (eczema, psoriasis), CBD cosmetics (toner, serum lotion), shampoo, conditioner and pomade, edible CBD or THC, cookies, chocolate, brownies and candies mixed with cannabis (see Figure 1).

Legitimate medical cannabis products must undergo strict lab testing, leading to high prices. For example, original CBD products manufactured in the UK and sold in Malaysia were priced from RM199 to RM1,450. Meanwhile, CBD products from Thailand cost RM150–RM700. On the other hand, CBD products made in Malaysia were significantly cheaper, ranging from RM5–RM400. Nevertheless, medical cannabis products from Malaysia derived from compressed marijuana

may contain harmful substances, such as pesticides, chemical fertilisers, or heavy metals. Furthermore, cannabis products may contain THC compounds that may lead to the users experiencing a high euphoria and overdose. Therefore, it is hazardous for consumers to purchase cannabis products illegally.

Some parents also turn to these Facebook Pages for medical cannabis treatment for their children (FB1 to FB13). Nonetheless, product safety, including dosage, quality, and efficacy, is not guaranteed without certification from the governing authorities. Two users raised the issue of product safety and asked the administrator how to ensure the originality of their products. The seller responded by urging potential buyers to purchase the product and referring to other patients' testimonies. In addition, sellers that offer medical cannabis products from Malaysia and Thailand did not provide evidence of any lab test for their products to guarantee the originality and the safety of the product contents. Some sellers claim that their medical cannabis product can be used as a supplement; therefore, no quality certificate is necessary. This statement is misleading since all supplementary products in Malaysia must be certified by the Ministry of Health and registered with the National Pharmaceutical Regulatory Agency (NPRA) (Sale of Drugs Act 1952; NPRA 2018).

The UK CBD products have different flavours (peppermint, orange, or natural flavours), while the CBD oils are available at different concentrations (3%, 5%, 10%, 20%, and 40%), which are claimed to be suitable for various illnesses. In contrast, Malaysian CBD oils were categorised based on their net weight (500 mg, 1000 mg, 5000 mg). The sellers claimed that 1000 mg of the medical cannabis product is similar to 10% CBD, but they could not provide any evidence for this statement, such as lab tests or a quality assurance certificate. Therefore, the CBD concentration in their products may be lesser than they claimed. Other issues concerning product safety were inexplicit content, mislabelling, and incorrect and misleading information (Hazekamp 2018; Watts et al. 2021; Vandrey et al. 2015). Despite the questionable product quality, previous studies reported that most medical cannabis and CBD oil available online were unsafe for medicinal purposes (Hazekamp 2018; Lachenmeier and Diel 2019; Watts et al. 2021). Several CBD-only products have been reported to contain no detectable CBD (Hazekamp and Epifanova 2017) and trace quantities of THC, which could result in a positive urine drug test (Hazekamp 2018; Lachenmeier and Diel 2019). Additionally, studies have revealed the presence of harmful substances and contaminants in some medical cannabis products (Dryburgh et al. 2018; Evans 2020; Montoya et al. 2020). For instance, Seltenrich (2019) and McPartland and McKern (2017) revealed that the medical cannabis products sold in pharmacies contained harmful substances and microorganisms, including salmonella, *E. coli*, pesticides, and dangerous

solvents. Furthermore, the products were falsely labelled, and the products failed the purity and potency tests (Spindle et al. 2022). Reliable information is essential, particularly for medicinal use, because mislabeling cannabis products could seriously harm consumers, especially patients, senior citizens, and children. Therefore, consumers must insist that sellers provide lab test certificates to ensure product quality and safety.

Potential buyers often ask how to administer medical cannabis products in the comments section. The seller and experienced users recommended several administration methods: (1) drop cannabis oil under the tongue (3 to 7 drops) and wait a few minutes before swallowing it. The product should be taken twice daily, after breakfast and before sleep. Some users take it five times daily (after/before prayer); (2) add a few drops of cannabis oil into a glass of water, stir and drink; (3) add a few drops of cannabis oil in food; (4) apply cannabis cream or oil on the skin (psoriasis/eczema); and (5) take two teaspoons of hemp oil twice daily. Moreover, some users enquired if it is safe to consume medical cannabis with other medications provided by the hospital. The sellers advised them to consume the medical cannabis one to four hours before or after taking their prescribed medication. Some users also shared that they did not like the taste of the medicinal cannabis due to the bitterness; it felt like they were swallowing olive oil. Nevertheless, none of the sellers requested medical reports from the buyers to ensure they had legitimate medical conditions. It should be highlighted that the sellers are not medical doctors that can prescribe any product as treatment. Therefore, the government must establish the proper legislation and a monitoring mechanism to regulate the activities of these sellers and ensure the patients' safety in Malaysia.

Figure 1: Types of medical cannabis products and price.

Theme 5: Adverse health effects

Earlier studies have revealed the lack of discussion and information on the harmful effects of medical cannabis in various countries, including Malaysia (Hadirah and Noor Munirah 2019; Thaikla et al. 2018). Conversely, this study found that the topics were discussed on the selected Facebook Pages. Nonetheless, potential users did not seem too concerned about the adverse health effects of medical cannabis; only a handful of consumers asked the administrators or other followers about the issue. The adverse health effects mentioned in the pages were hunger pangs, food cravings, dizziness, fever, nausea, diarrhoea, fatigue, drowsiness, and dry mouth. In addition, a user who is diagnosed with a nerve problem experienced body pain after consuming medical cannabis products. Other users reported feeling high, which may be caused by the absence of genuine CBD in the products purchased from the black market.

Alternatively, the products may have been derived from compressed marijuana leaves that contain higher THC that may cause "highness" or euphoria. Therefore, the users must choose certified and lab-tested medical cannabis to ensure the product's originality and quality. One user claimed that the medical cannabis cured his illness and has since stopped using the product because he was concerned about the content's originality and safety. In addition, several testimonies stated that they did not feel any adverse health effects after consuming the medical cannabis product, such as nausea or vomiting. This situation illustrates that the side effects of cannabinoids vary between individuals (see Appendix: Table D).

Past research has emphasised the potential of CBD as a new-age medication with novel mechanisms of action to address unmet therapeutic needs (Huestis et al. 2019). Despite that, CBD has been known to cause adverse health effects and toxicities like other drugs (Huestis et al. 2019). Common side effects of CBD are dizziness, drowsiness (Caulley, Caplan and Ross 2018; Rapisarda, Lim and Lee 2017), nausea (Ogborne et al. 2000), vomiting (Ogborne et al. 2000), sedation (Nurmikko et al. 2007; Huestis et al. 2019), dry mouth or eyes (Kudahl et al. 2021), diarrhoea, hepatic abnormalities, malaise and lethargy (Huestis et al. 2019). Based on the testimonies on the Facebook Pages, most reported side effects are mild, well-tolerated, and only last a few days until the patient's body adapts to the products. This observation may be explained by the cannabis compounds that condition the human body to develop tolerance towards the products.

Earlier studies have also reported prolonged side effects for up to weeks that are mild to moderate and well-tolerated (Beaulieu et al. 2016; Devinsky et al. 2017). According to Dos Santos et al. (2020), serious adverse effects are rare and

primarily comprise increased transaminases, drowsiness, convulsion, fatigue, and upper respiratory tract infections. Conversely, Hazekamp (2018) highlighted the possible hazards of long-term CBD usage, particularly in youngsters, older people, and those with impaired immune systems. Despite the therapeutic benefits of CBD in the short term, it is unclear if these effects will last and how CBD may interact with other medications prescribed to the patients.

RECOMMENDATIONS

This research found medical cannabis is available on popular social media platforms, despite the illegal status of cannabis in Malaysia. The current findings also corroborated earlier reports that Facebook users are exposed to information that encourages the usage of medical cannabis. Furthermore, the supply and demand for medical cannabis are highly evident in Malaysia. Most patients look for medical cannabis online as a part of their conventional therapy or an alternative to their current treatment. Moreover, cannabis is a natural herb; thus, making the product cheaper than their existing treatment. Therefore, patients, particularly those who cannot afford medical attention in hospitals, turn to cannabis as an alternative treatment. In addition, some cancer patients cannot undergo chemotherapy or surgery because of their age and conditions. Medical cannabis offers a solution to modulate and control their pain. Ultimately, it is essential to give patients access to medical cannabis since some of them are in desperate need of medical cannabis as an alternative solution to their illnesses. They are willing to break the law and risk being penalised for a chance to improve their quality of life.

The research findings indicated that conversations about the risks and benefits of medical cannabis are being conducted freely on social media platforms, such as Facebook. As a result, the public is comfortable broadcasting their experiences in using medical cannabis and discussing the harmful side effects. Furthermore, the testimonies revealed that medical cannabis could improve patients' health and quality of life, which aligned with the literature. In addition, the adverse effects of medical cannabis were reportedly mild and only lasted a few days. Therefore, the Malaysian government should actively fund and conduct research and clinical trials on the benefit of medical cannabis. In addition, it is recommended that the government establish a medical cannabis centre for research and education purposes to improve the public understanding and awareness of the different types of cannabis, medicinal benefits, and products suitable for Malaysian users.

The study findings also raised concerns about the non-regulated and illegal medical cannabis products available in Malaysia. Studies have shown that untested and uncertified medical cannabis products could be contaminated, sub potent, or super potent; thus, risking the patients' lives. The manufacturing process is not transparent; thus, compromising the quality, safety, and chemical content of the cannabis products. Furthermore, the cannabis product may be derived from compressed marijuana; hence, containing high percentages of THC that may harm the users. Compressed marijuana is known to contain pesticides and other harmful substances that may put the patient's life at risk. Therefore, the risks and long-term impacts of medical cannabis, particularly for vulnerable groups such as children, young adults, the elderly, and chronic or terminally ill patients, remain uncertain. The *halal* status of medical cannabis products is also questionable since the contents are seldom specified; thus, compromising Muslim consumers. According to Alzeer et al. (2020), in Islam, a cannabis product is only *halal* if it contains a maximum of 0.03% THC. Therefore, it is dangerous for Muslim consumers, especially in Malaysia, to purchase medical cannabis from the black market. Furthermore, reported side effects of THC include anxiety, tachycardia, drowsiness, and hunger.

CONCLUSION

In conclusion, the current study illustrated the crucial need for the accessibility of medical cannabis in Malaysia. Patients will continue to access cannabis from the black market without proper law and regulation because supply and demand exist in Malaysia. Therefore, it is recommended that the new cannabis law must require manufacturers to adhere to significantly stricter safety, efficacy and quality standards. Furthermore, this study provided up-to-date data about the supply and demand of medical cannabis on Facebook in Malaysia, which can aid the development of strategies to control and curb unlawful activities. Therefore, the Malaysian government needs to decriminalise and regulate medical cannabis products, particularly CBD, to ensure that patients can access proper medical advice about the safety and usage of medical cannabis and plan their course of treatment to improve their quality of life.

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APPENDIX

Table A: Facebook pages in Malaysia related to cannabis (as of 17.6.2022)

Pages	Number of likes	Number of followers/ members	Types of online content	Date of starting page	Date of the last post	Mode of communication	Product origin
FB1	1,945	2,049	Direct selling medical cannabis	25.04.2021	06.05.2022	Private messenger and Telegram	Malaysia
FB2	5,347	5,467	Direct selling of CBD oils and recreational cannabis	28.01.2020	07.09.2020	Private messenger and Telegram	Malaysia
FB3(a)	–	43,000	Direct selling of CBD products and hemp seed oil	10.11.2014	06.06.2022	Private messenger and WhatsApp	UK
FB4(a)	1,700	1	Direct selling of CBD products and hemp seed oil	10.01.2019	15.06.2022	Private messenger and WhatsApp	UK
FB5(a)	15,966	16,932	Direct selling of CBD products and hemp seed oil	29.06.2018	16.06.2022	Private messenger and WhatsApp	UK
FB6(a)	5,934	6,345	Direct selling of CBD products and hemp seed oil	30.09.2017	06.06.2022	Private messenger and WhatsApp	UK
FB7	–	4,251	Direct selling of medical cannabis	17.06.2021	26.04.2022	Private messenger and WhatsApp	Malaysia
FB8(a)	1,062	1,147	Direct selling of medical cannabis	06.03.2021	01.05.2022	Private messenger and WhatsApp	Malaysia
FB9	125,688	128,211	Direct selling of medical cannabis	12.08.2015	08.02.2021	WhatsApp	Thailand
FB10(a)	1,217	1,285	Direct selling of medical cannabis	17.03.2021	13.04.2021	WhatsApp	Thailand
FB11	2,240	2,456	Direct selling of recreational cannabis, e-liquid, CBD oil, flavoured cannabis	02.11.2020	10.06.2022	WhatsApp	Malaysia

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Table A (*continued*)

Pages	Number of likes	Number of followers/ members	Types of online content	Date of starting page	Date of the last post	Mode of communication	Product origin
FB12	5,045	5,250	Direct selling of hemp oil products	17.05.2016	24.08.2021	Private messenger and WhatsApp	Malaysia
FB13	11,433	11,438	Direct selling of medical cannabis	26.10.2013	23.11.2015	Private messenger	Malaysia
FB14	4,430	4,552	Promotes medical cannabis	21.02.2017	23.02.2022	Private messenger	Thailand
FB15	41,946	66,292	Education on how to grow cannabis Provides information on how to purchase cannabis seed and medical cannabis	31.03.2020	16.06.2022	Private messenger and Telegram	Malaysia
FB16	2,900	876	Direct selling of medical and recreational cannabis	20.04.15	16.06.2022	Private messenger and Telegram	Malaysia
FB17	122,922	–	Promotes medical and recreational cannabis Provides information on how to purchase medical cannabis	19.04.2012	16.06.2022	Private messenger	Malaysia
FB18	26,584	–	Promotes medical and recreational cannabis Provides information on how to purchase medical cannabis	28.08.2020	16.06.2022	Private messenger	Malaysia
FB19	20,053	–	Promotes medical and recreational cannabis Provides information on how to purchase medical cannabis, CBD product and Kratom	18.03.2020	16.06.2022	Private messenger	Malaysia

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Table A (*continued*)

Pages	Number of likes	Number of followers/ members	Types of online content	Date of starting page	Date of the last post	Mode of communication	Product origin
FB20	30,540	40,919	Members provide information on how to purchase CBD products Education and awareness on hemp and CBD	11.05.2016	16.06.2022	Private messenger	Malaysia
FB21	–	10.815K	Members give information on how to purchase CBD products Education and awareness on hemp and CBD	12.10.2013	16.06.2022	Private messenger	Malaysia
F22_	39,465	44,034	Testimony and demand for information Education and awareness of medical marijuana	20.12.2012	12.06.2022	Private messenger	Malaysia
F23	9,880	10,054	Give information on how to purchase medical and recreational cannabis	20.08.2012	12.07.2020	Private messenger	Malaysia
F24	–	2,490	Direct selling of medical and recreational cannabis	13.04.2020	16.06.2022	Private messenger	Malaysia
F25	22,977	23,055	Give information on how to purchase medical and recreational cannabis	20.03.2012	20.04.2016	Private messenger	Malaysia
F26	7	7	Direct selling of medical and recreational cannabis	19.01.2022	06.06.2022	Private messenger and Telegram	Malaysia

Note: (a) Similar product but has different Facebook pages/same name but a different URL

Table B: Posts and comments categorised by types of diseases

Types of diseases	Example of posts
Cancer: Brain tumour, prostate, colon, nasal, breast, leukaemia, lymphoma, neuroblastoma, cervical, ovarian, gallbladder, peripheral nerve tumours	Can blood cancer patients use this product? My wife has stage four cervical cancer, and the cancer has spread to the hip, bones, liver, and lungs. The doctor used morphine. The cost of treatment is very high. Therefore, I requested the doctor to discharge her from the ward. I want to try CBD oil as a painkiller. Where can I get this CBD oil? Thank you. Where can I get the CBD oil? My aunt is suspected of having liver cancer or lymphoma. I hope someone can help me to get this CBD 🙏 I would like to know if CBD oil is suitable for nerve cancer. My friend's wife is suffering from stage four nerve cancer. Hi everyone. I need Rick Simpson Oil for stage four breast cancer. Please private message me. My father was diagnosed with cholangiocarcinoma cancer. Do you have a contact number? My brother has stage four oral cancer. Excuse me, is medical cannabis suitable for lymphoma?
Cyst	Can I use this medicine for cyst treatment, and how do I use it, sir?
Blood clots	Can I use CBD for blood clots in the brain?
Auto-immune diseases	Greetings everyone! Is CBD suitable for auto-immune inflammatory bowel disease?
Anxiety, panic attack, depression, schizophrenia, bipolar disorder	Where can I find CBD? I suffer from panic disorder and anxiety. Greetings, I want to ask if CBD oil can treat schizophrenia. I have schizophrenia. Can CBD oil be used for depression or bipolar disorder?
Syphilis	I want to ask, sir. Can CBD cure syphilis?
Gout	How do I get cannabis oil? I have gout.
Haemorrhoids	Is cannabis a suitable treatment for haemorrhoids?
Intestinal and liver disease	Which cannabis oil is suitable for intestinal and liver disease?
High blood pressure	I have purchased hemp oil. How do I use it? I have cholesterol and high blood pressure.
Diabetic	Can type two diabetes be cured using CBD oil? I have a question. My father has diabetes and uses insulin injections as a treatment. Now his legs are numb and painful when sitting or standing for a long time. Is CBD suitable for his condition? Please advise.
Parkinson's disease	Can I use hemp oil for Parkinson's?
Slipped disc	Is it helpful to use CBD for slipped disks?
Short-sightedness	Can I use cannabis for short-sightedness?
Eczema	Can I use cannabis oil for eczema?
Asthma	Can I use cannabis oil for asthma?

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Table B (*continued*)

Gerd, gastric	Hi, anyone with GERD, gastric, anxiety, or panic attacks who have tried using CBD oil? I've tried all kinds of products except CBD.
Crohn's disease	Which product is suitable for Crohn's disease?
Hepatitis C	Can hepatitis C be treated with CBD oil?
Heart disease	I would like to know if cannabinoids are helpful for heart blockage
Thyroid	Can CBD be used for thyroid patients?
High cholesterol	Can those with high cholesterol and heart problems use this cannabis oil?
Kidney disease/failure	Can kidney disease be treated with cannabis oil? Which treatment is more efficient?
Urinary incontinence	If a person suffers from urinary incontinence, can he use cannabis oil?
Epilepsy	Can I use cannabis oil for children with epilepsy?
Insomnia	Can a person with insomnia use CBD?
Chronic pain	Admin, please private message the price to me. I want to purchase the product for my mum because she suffers from chronic pain.
Cyst	Can I use this medicine for cyst treatment? How to use it, sir?
Autism	Which cannabis oil is suitable for an autistic child?
Stroke	My mother-in-law has suffered a stroke. Can this remedy help her?
Severe acne	Can I use CBD oil for severe acne? Please private message me.
Psoriasis	Can CBD oil treat psoriasis?
Broken bone	I have a broken leg. Can anyone tell me if CBD oil can mend broken bones?
Rheumatoid arthritis	Is cannabis oil a suitable treatment for rheumatoid arthritis?
Tonsilitis	My daughter is six years old and suffers from tonsilitis. Can cannabis oil treat tonsilitis?

Table C: Testimonies posted by the sellers or medical cannabis users on the benefit of medical cannabis

Disease	Testimonies
Anxiety, depression	I have anxiety and depression. Alhamdulillah, I thank God for my health after taking several drops of CBD oil under the tongue, according to the prayer time. My anxiety is improving gradually. I can sleep peacefully and no longer wake up in the middle of the night. I used to suffer from panic attacks and breathing difficulties. My health has improved after taking this CBD oil. CBD oil is good for anxiety. I have almost fully recovered from severe anxiety. I am completely fine now. The CBD oil works for anxiety and depression.
Insomnia	I have been using this product for only four days, and I can already tell the difference. I sleep better, my mood has been uplifted, and I have more energy, memory, and focus. I recommend this remedy to everyone. So far, so good. If I cannot sleep, I use two drops. It improves my sleep quality. I consume CBD, but this product does not work for insomnia. This treatment is helpful for relaxation and to reduce my pain due to a broken leg.
Nasal cancer	I am a CBD user. I am suffering from stage two nasal cancer. I also continue with the treatments at the hospital. Now I am healthy. Based on the feedback from the doctor, my cancer is no longer active. Now I attend monthly follow-ups.
Chronic pain	I have SLE, chronic eczema, graves disease, and anxiety. I use CBD oil, hemp capsules, and hemp oil. These products are effective for my anxiety and other chronic pain. I feel calmer and relaxed and have better control of my emotions. I used one drop while suffering the pain of childbirth. The CBD is effective, and the pain is currently severe but manageable.
Cancer	The CBD oil is suitable for all types of cancer. Alhamdulillah. My neighbour has stage four colon cancer. The doctor said there was no need for chemotherapy. Subhanallah, with God's permission. My neighbour only consumed six bottles of CBD oils.
Cervical cancer	My boss's mother-in-law, who had stage four cervical cancer, is now completely cancer-free. She consumed CBD oils.

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Table C (*continued*)

Breast cancer	After consuming CBD for one month, the lump in my breast has shrunk. The pus is also gone. Maybe the pus in the breast is all out. The wound has dried, but the pain remains.
Lymphoma	My dad suffers from stage four lymphoma. He exhibited positive results after using 1000 mg of CBD oil a week. My dad says CBD makes the pain bearable. He uses CBD oil instead pain killers. I would like to introduce 5000 mg CBD oils to him soon. I will update here if there are any improvements, InsyaAllah.
Brain tumour	I fully support the use of medical cannabis. I used it to treat my son, who had a brain tumour. My son is 90% paralysed. Alhamdulilah, my son is now healthy after consuming cannabis oil by Allah's permission.
Epilepsy	I have epilepsy and tried CBD. Alhamdulillah I am ok. Make sure not to skip hospital medication.
High blood pressure	Alhamdulillah. My high blood pressure rate has been good and in control since using CBD oil. I am a stroke survivor.
Stroke	Alhamdulillah. My mother had a minor stroke four years. After taking medical marijuana, she regained her energy and got better.
Diabetic	Good. I am diabetic and use insulin four times daily. Alhamdulillah, with God's permission, I have reduced my insulin doses, and my sugar level is below 5.
Haemorrhoids	My haemorrhoids disappeared within seven days of using the cannabis oil.
Gastric	The CBD oil is the best. I feel calm. My gastritis is recovering without taking medicine prescribed by the doctor.
Psoriasis	Yesterday was my second-day consuming hemp capsules. Psoriasis has dried up. My skin is getting better. It is not red anymore. Otherwise, I feel itchy and have to scratch until my skin is wounded.
COVID-19	I'm a long covid patient. My cough persisted for approximately four months. My body feels weak. The covid subsided after a week, and the body is getting better after using CBD Malaya hemp and hemp seed oil
Asthma	I use hemp seed oil. Alhamdulillah, my asthma is getting better.
Sinusitis	Alhamdulillah, my mom has recovered from sinusitis. She spent 40 years trying all sorts of medicine that did not aid in her recovery.
Stress	Alhamdulillah. I feel calm and happy.
Autism	My son is autistic, and CBD is beneficial for him. He can say a few words now. He is gradually improving.

Table D: Harmful effects of medical cannabis

Testimonies on harmful effects of medical cannabis
Norliza [redacted]: Does it have any adverse effect? Is it suitable for a boy with a disability who has tantrums to calm him down? Where can I get this oil?
Ummi [redacted]: I also just started using it early Ramadhan. I have a problem with the nerve in my right limb. After consuming cannabis oil, my condition got worse. I feel pain
Ct [redacted]: I stopped taking cannabis oil temporarily because the effect makes me hungry and nauseous. I also felt pain on the right side of my body. I was fasting during Ramadhan at that time. I had difficulty waking up for Subuh prayer. My stomach feels empty for a long time. I will start take the oil again on Syawal.
Ireen [redacted]: It's the same. My throat is dry. I feel sleepy. I sleep deeply. So far, it is ok. Thanks to God.
Ain [redacted]: I took CBD oil and felt weak, lethargic, and had a sore throat. My cough is getting worse. I still continue. Our body tolerance is not same.
Mohd [redacted]: The first time I used CBD, I had some adverse effects, such as vomiting, diarrhoea, and lethargy, until my body got used to CBD. After some time, I don't feel any side effects. I already stopped taking medicine from the hospital for a long time.
Dato [redacted]: I use cannabis oil, but I don't feel any side effects.
Rahim [redacted]: Thanks, God. Now, I don't feel dizzy anymore. I have used two bottles of cannabis oil.
Yong [redacted]: I use it for my gastric. It makes me constantly hungry and eat more than usual.
Azad [redacted]: It is nonsense for those who said CBD can cause you to become high. You can consume one bottle, and it will not make you high. I consume it, and I am not even stoned. I am so happy my blood pressure is now stable. I had a stroke due to high blood pressure.
Izzaty [redacted]: I just tried last night. I feel pain on my head.
Wan [redacted]: I bought CBD oil. I drip it under my son's tongue. My son had a fever that night, but he only had a fever for a day. I'm afraid to feed him CBD again.