

Knowledge, perception, and beliefs of Saudi physicians at King Abdulaziz Medical City, Riyadh related to medical cannabis: Literature review and a cross-sectional survey

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ABSTRACT

Cannabis is an herbaceous flowering plant, originally an indigenous plant in Eastern Asia, which later spread globally due to widespread agricultural practices. Cannabis was used medicinally until the early twentieth century, but subsequently prohibited due to the psychoactive effects. **Aims:** To explore the medical cannabis-related level of knowledge of physicians at King Abdulaziz Medical City, including patient needs, perceptions of therapeutic effects, potential harm, and the willingness to prescribe if legalized in future. **Methodology:** The study was a cross-sectional questionnaire-based survey. It was conducted at King Abdulaziz Medical City in Riyadh from February 2020 to February 2021. All physicians from the different specialties, who consented to participate, were included in this study. **Statistical Analysis:** Descriptive statistics are presented as mean and standard deviation and proportions. An ANOVA test was applied to measure the association of the beliefs regarding the right to prescribe with overall knowledge. All tests were considered significant at $P < 0.05$. **Results:** A total of 249 physicians participated with the majority (70%) male. The sample was similar regardless of the physician's position in the medical hierarchy, with a mean work experience of 8 years. Almost half of the participants indicated that they do not have good knowledge regarding the effects of MC products and more than half that they are unaware of the different MC products and formulations currently available. **Conclusion:** The majority of the sample lacked knowledge about the medicinal use of cannabis for specific indications and felt uncomfortable to discuss the medicinal use of cannabis with their patients.

Keywords: Cannabis, knowledge, physicians, Saudi

Introduction

Cannabis is an herbaceous flowering plant, indigenous to Eastern Asia, which spread globally due to widespread

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agricultural practices.^[1] The parts of the plant are harvested differently depending on the specific use.^[2] Cannabis was used medicinally until the early twentieth century, but subsequently opium, coca, and cannabis were prohibited due to the psychoactive effects. During this period, healthcare professionals were educated in a system where cannabis was considered illegal.^[3]

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A comprehensive review of medical literature related to the health effects of cannabinoids and cannabis was reported by the National Academies of Sciences, Engineering, and Medicine (NASEM).^[4] NASEM concluded that there is “conclusive and substantial evidence” that medical cannabis (MC) is potent to relieve spasticity in multiple sclerosis, nausea, and vomiting-associated chemotherapy and chronic pain.^[5] Currently, medication containing natural or synthetic cannabinoids are approved by the FDA for medicinal use as an antiemetic in cancer patients, an appetite stimulant for weight loss in AIDS patients, overactive bladder, epilepsy, neuropathic pain, and spasticity, and less frequently to augment analgesic treatment in several countries.^[6] However, NASEM also concluded that there is substantial evidence of the relationship between cannabis use and motor vehicle accidents, smoking cannabis and airway disorders, lower birth weight offspring, and schizophrenia or other psychosis.^[5,6]

Controversy between patients and physicians exists regarding the medical use of cannabis. In this paper, we discuss the medical use of cannabis. In Canada, a survey assessing the MC-related knowledge of physicians indicated a lack of knowledge in terms of dosing and initiating a treatment plan for patients using MC and prescribing cannabinoid medication. The level of knowledge was higher in terms of the warning signs, risks of MC, and safety. The survey concluded that 87.5% and 87.3% of the physicians had a good or very good level of medical knowledge of MC. The majority (64%) indicated a strong educational need related to MC use, compared to 19% neutral, and 17% not very strongly or not at all.^[7] In Australia, a survey assessing the knowledge and attitudes of general practitioners (GPs) to MC reported that the majority (61.5%) indicated one or more patient asking for MC in the previous three months. The majority of the sample considered their knowledge insufficient and only 28.8% felt comfortable talking about MC with their patients. Over half (56.5%) of the GPs supported prescribing MC and preferred trained GPs prescribing independently of specialists. The GPs supported the use of MC for specific conditions such as pain, epilepsy, palliative care, and cancer, with much lower support for use in grief and anxiety.^[8]

The legal status of MC is highly controversial.^[9] Cannabis has been legalized medically in many country such as Denmark, Switzerland, Norway, Poland, Thailand, the Netherlands, Spain, Georgia, Germany, Austria, South Korea, Romania, Colombia, San Marino, Turkey, Argentina, Israel, Lithuania, Canada, New Zealand, Italy, Greece, Bermuda, Malta, Vanuatu, Luxembourg, Cyprus, Finland, Jamaica, Chile, Portugal, Australia, Czech, South Africa, Uruguay, Croatia, Zimbabwe, Ireland, North Macedonia, Peru, Republic of Slovenia, Philippines, Sri Lanka, the UK, and the USA. In the Middle East and the rest of the world, cannabis is still illegal.^[10] In countries such as the USA, legal MC use is spreading in many states (29 states and districts) and recreational use is allowed in seven states (Oregon, California, Alaska, Maine, Massachusetts, Colorado, Washington, and Washington, D.C.).^[11]

The aim of the study was to explore the level of knowledge of Saudi physicians regarding MC, including patient needs, perceptions of therapeutic effects, and potential harm and willingness to prescribe. A second aim was to explore whether Saudi physicians are sufficiently prepared and educated about MC before the legalization of marijuana for medical purposes, due to the predictable increase in use. To our best knowledge, no study in Saudi Arabia or the Arab world focused on MC use. Our objective was to assess the knowledge, perceptions, and beliefs of Saudi physicians at King Abdulaziz Medical City (KAMC) regarding MC and their preparedness to prescribe MC, if legalized in future.

Subjects and Methods

Study design and participants

The study was a cross-sectional questionnaire-based survey. The study was conducted at a tertiary healthcare hospital in Riyadh from February 2020 to February 2021. Ethical approval was obtained before the commencement of the study. Institutional review board (IRB) approval for the research was obtained from King Abdullah International Medical Research Centre (KAIMRC). All physicians from the different specialties, who consented to participate, were included in this study. The participants were selected using a purposive sampling technique. The sample size was calculated with a 5% margin of error, 95% confidence level, and the optimal sample size was 249.

Data collection process and the questionnaire

The questionnaire was selected based on a thorough literature review and adopted from a prior study.^[8,9] The questionnaire had four sections, including a demographic information section, attitude toward restrictive and non-restrictive use of MC, beliefs, and knowledge about the conditions for which MC can be prescribed, side effects of MC, and the improvement of symptoms after a MC prescription. The responses were recorded on a 5-point Likert scale, with 1 representing disagreement and 5 agreements. To measure the attitude toward MC, four items, also with a 5-point Likert scale, were used. A non-restrictive attitude was measured with items 2 and 6, and items 11 and 12 measured a restrictive attitude. The score for the attitude section restrictive and non-restrictive ranged from 2 to 10. The total scores were converted to a mean score to be comparable with the Likert scale score.

The section assessing the beliefs about MC included nine items (1, 3, 4, 5, 7, 8, 9, 10, and 13). The total score for the beliefs section ranged from 9 to 45. Similar to the attitude section, the total score was converted to a mean score. The knowledge section had 34 items, divided in four subsections: 1) specific indications for MC, 2) major side effects of MC therapy, 3) comparison of MC with other psychotropic medications, and 4) the effect of MC on the improvement of symptoms. The indications for prescribed subsection consisted of 14 items, and the score ranged from 14-70, subsection two eight items (score 8-40), subsection three six items (score 6-30), and the fourth six items, with the

score ranging from 6-30. The total score for the knowledge items ranged from 34-170.

Reliability analysis

To assess the suitability of the questionnaire in our population, reliability testing was performed for the 47 items. The Cronbach alpha was 0.88. The domain, beliefs of participants, had 13 items, and none scored less than 0.77, and for the combined score, the Cronbach alpha was 0.81. The reliability of the knowledge sections about the use of MC (14 items), side effects (8 items), indications for MC (6 items), and comparison with other medication (6 items) was 0.93, 0.88, 0.85, and 0.92, respectively. The questionnaire had good internal reliability in our population.

Statistical analysis

The statistical analysis was performed using the Statistical Package for Social Sciences (IBM® SPSS® version 21). The descriptive statistics are presented as mean and standard deviation (SD) as well as frequency and proportions. The score for each section was converted to a mean score. Subsequently, the mean was categorized in three categories: disagree (1-2), uncertain (3), and agree (4-5) for the restrictive and non-restrictive attitude, and the beliefs and knowledge about MC to make it comparable to a Likert scale for the purpose of interpretation. The cutoff level for sufficient knowledge about MC was based on a mean score of >66% of the maximum score, based on the double of what can be achieved by random sampling. For example, as the maximum score for the 34 items was 170, the cutoff score for sufficient knowledge was >112.2. To measure the association of sufficient knowledge with the demographic variables, attitude, and beliefs, a Chi-square test was used. To measure the opinions regarding the right to prescribe with the overall knowledge, an ANOVA test was used. The *P* value was considered significant at 0.05 for all the tests used.

Results

Profile of participants

The majority of the sample were male 70% (n = 218), specialists and consultants represented 50% (n = 156) and the residents and physicians also 50% (n = 154). Specialists in medicine constituted 26% (n = 80), surgery and anesthesia 23% (n = 70), oncology 16% (n = 50), family medicine, neuropsychiatry and ER (13% (n = 40), 13% (n = 40), and 10% (n = 30)), respectively. The age of the sample ranged from 25 to 43 years, with a mean age of 34 ± 9 years. Work experience ranged from 1 to 15 years, with a mean of 8 ± 7 years and the time in hours spent in clinical practice per week from 29 to 57 hours, with a mean of 43 ± 14 hours. Only 11% (n = 33) of sample's relatives used street cannabis, and the majority (57%, n = 175) of the patients would not have benefitted from MC products in the last three months. The highest proportion (47%, n = 146) indicated that the right to prescribe MC should be for specialists only [Table 1].

Participants' attitudes and beliefs regarding medical cannabis

A third (36%, n = 33) of the sample, in terms of their beliefs, agreed to the use of MC, 34% (n = 74) agreed with the indications for MC, 50% (n = 109) with the major side effects of MC consumption, and 27% (n = 59) that MS is hazardous compared to other psychotropic medication. Less than a third (28%, n = 88) of the sample agreed that they had patients who may benefit from MC, 42% (n = 129) that MC products should be available on prescription for specific indications, 21% (n = 64) felt comfortable discussing MC with their patients, and 30% (n = 92) indicated that they had a good level of knowledge of the effects of MC products. In terms of MC products and formulations, only 23% (n = 72) knew the MC products and formulations currently available, 69% (n = 215) agreed that MC should be prescribed by specialists, 48% that MC should be provided in "shared care" with a specialist, and 44% (n = 136) that only GPs who have undergone specific training and credentialing should be allowed to prescribe MC. Less than a third (29%, n = 90) agreed that there is little difference between "street cannabis" and MC products and 32% (n = 98) that there is sufficient scientific evidence of the efficacy of MC. However, the overall agreement about the use of MC was only 36% (n = 33) [Table 2].

The majority of the sample (66%, n = 206) agreed that MC could be used for chronic cancer pain, 34% (n = 105) chronic non-cancer, 44% (n = 136) neuropathic pain, 27% (n = 82) intractable epilepsy, 23% (n = 70) anti-tumor effects, 30% (n = 94) spasticity in multiple sclerosis, 24% (n = 75) dementia patients with agitation, 20% (n = 62) insomnia, 24% (n = 74) PTSD, 25% (n = 77) anxiety, 25% (n = 77) depression, 57% (n = 176) end of life/palliative care, 42% (n = 129) chemotherapy-induced nausea and vomiting, and 30% (n = 93) cachexia associated with severe illness. The overall agreement with the indications of MC use was 34% (n = 74). Regarding the major side effects, the majority (63%, n = 195) agreed with addiction and dependence, 54% (n = 168) cognitive impairment, 62% (n = 192) driving impairment, 37% (n = 116) weight gain, 50% (n = 155) psychosis, 44% (n = 137) other long-term mental health issues, 43% (n = 133) interactions with other medication, and 44% (n = 137) the impact on the developing brain. The overall perception of the major side effects of MC consumption was 50% (n = 109). Regarding the belief that MC was more hazardous, less than a third (27%, n = 83) indicated opioids, 29% (n = 91) benzodiazepines, 27% (n = 82) antipsychotics, 32% (n = 100) statins, 21% (n = 64) chemotherapy drugs, 30% (n = 92) antidepressants, with the overall perception 27% (n = 59) [Tables 2 and 3].

Regarding the effect of MC on the psycho-social mode of patients, only 7% agreed that MC affects physical function, 9% energy, 30% mood, 27% enjoyment of life, 13% social engagement, with only 9% with the effect on the ability to work [Figure 1].

Table 1: Demographic profile of the sample (n=310)

Variables	Category	Frequency	%
Age (years)	Mean±SD	34±9	
Work Experience (years)	Mean±SD	8±7	
Hours spend in clinical practice (per week)	Mean±SD	43±14	
Gender	Male	218	70
	Female	92	30
Designation	Resident/staff physician	154	50
	Specialist/consultant	156	50
Speciality	Medicine	80	26
	Surgery and Anesthesia	70	23
	Neuropsychiatry	40	13
	ER	30	10
	Oncology and other	50	16
	Family Medicine	40	13
Use of street cannabis by relatives	Yes	33	11
	No	277	89
How many of your patients in the past 3 months could benefit from medicinal cannabis products	None	175	57
	Only one	45	15
	2-5 patients	50	16
	6-10 patients	24	8
	>10	16	5
Right to prescribe MC should be given to,	All GPs	12	4
	Only GPs with specific training	59	19
	Only GP in shared care with specialist	43	14
	Specialists only	146	47
	MC should not be available on prescription	50	16

MC: Medical cannabis, SD: Standard deviation, GP: General practitioners

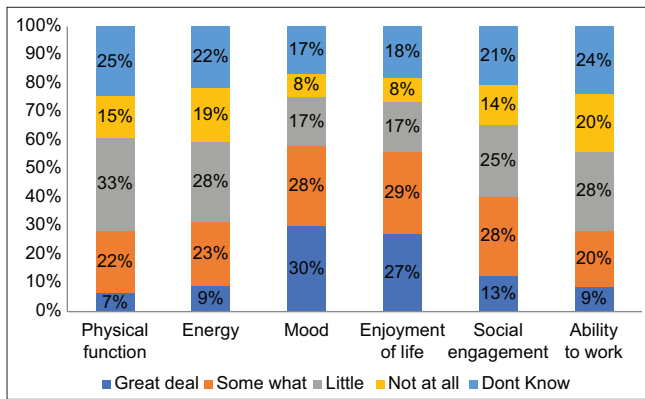


Figure 1: Knowledge of physicians about the effect of MC on patient symptoms (n = 310)

The group who had a non-restrictive attitude toward the prescription of MC had significantly better knowledge compared to the restrictive group (32% vs 62%) and (40 vs 11%) (p value < 0.001) [Figure 2].

The association between sufficient knowledge and the overall beliefs regarding MC was significant as 70% (n = 65) of the sufficient knowledge group agreed with MC, compared to the counter group (14%, n = 30). The association between knowledge of the MC indications and the group who agreed with MC is 85% (n = 78), compared to the group who disagreed with MC without sufficient knowledge, 26% (n = 54). Similarly, the sufficient knowledge of major side group and overall beliefs

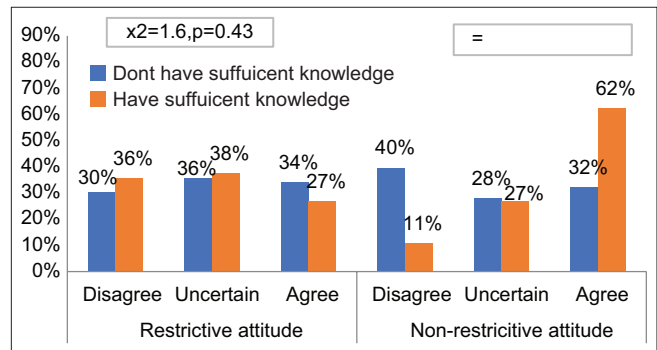


Figure 2: Comparison of level of knowledge with attitude of prescription

toward MC is significant (85%, n = 79) compared to the group without sufficient knowledge and in disagreement (27%, n = 59). Regarding the group who were knowledgeable of MC being more of hazardous, 48% (n = 45) of the group who agreed with MC had sufficient knowledge, compared to only 27% (n = 59) of the counter group. Finally, the majority of the group (74%, n = 69) agreed with MC use and the improvement of symptoms, compared to 27% (n = 59) in the counter group [Table 3].

There was a statistically significant association between the attitude toward MC prescription, knowledge of MC, and the level of knowledge (p value < 0.01). The one-way ANOVA indicated that the right to prescribe MC had a significant effect on the sample's overall MC knowledge (F = 16.08, P value < 0.001). The post hoc multiple comparison using the Bonferroni test indicated

Table 2: Descriptive statistics of all the items related to belief, knowledge of MC (n=310)

Items	Disagreement		Neutral		Agreement	
	n	%	n	%	n	%
Beliefs about the use of Medical Cannabis						
I have patients who may benefit from medicinal cannabis	131	42%	91	29%	88	28%
Medicinal cannabis products should be available on prescription now for certain indications	98	32%	83	27%	129	42%
I feel comfortable discussing medicinal cannabis with my patients	146	47%	100	32%	64	21%
I have good knowledge around the effects of medicinal cannabis products	136	44%	82	27%	92	30%
I am aware of the different medicinal cannabis products and formulations currently available	170	55%	68	22%	72	23%
Medicinal cannabis should only be prescribed by specialists	42	14%	53	17%	215	69%
Medicinal cannabis should be provided in “shared care” with a specialist	60	19%	101	33%	149	48%
Only GPs who have undergone specific training and credentialing should be allowed to prescribe medicinal cannabis	104	34%	70	23%	136	44%
There is little difference between “street cannabis” and medicinal cannabis products	128	41%	92	30%	90	29%
There is sufficient scientific evidence of the efficacy of medicinal cannabis	65	21%	147	47%	98	32%
Indications of Medical Cannabis use recommended in patients with						
Chronic cancer pain	46	15%	58	19%	206	66%
Chronic non-cancer	82	26%	123	40%	105	34%
Neuropathic pain	76	25%	98	32%	136	44%
Intractable epilepsy	88	28%	140	45%	82	27%
Anti-tumor effects	108	35%	132	43%	70	23%
Spasticity in multiple sclerosis	92	30%	124	40%	94	30%
Dementia patients with agitation	108	35%	127	41%	75	24%
Insomnia	130	42%	118	38%	62	20%
PTSD	119	38%	117	38%	74	24%
Anxiety	125	40%	108	35%	77	25%
Depression	138	45%	95	31%	77	25%
End of life/Palliative care	60	19%	74	24%	176	57%
Chemotherapy-induced nausea and vomiting	89	29%	92	30%	129	42%
Cachexia associated with severe illness	95	31%	121	39%	93	30%
Major side effects of medical cannabis consumption						
Addiction and dependence	44	14%	71	23%	195	63%
Cognitive impairment	45	15%	97	31%	168	54%
Driving impairment	33	11%	85	27%	192	62%
Weight gain	60	19%	134	43%	116	37%
Psychosis	47	15%	108	35%	155	50%
Other long-term mental health issues	42	14%	131	42%	137	44%
Interactions with other medications	48	16%	128	41%	133	43%
Impact on the developing brain	43	14%	130	42%	137	44%
Medical Cannabis is more hazardous than other medications	n	%	n	%	n	%
Prescription opioids	128	41%	99	32%	83	27%
Benzodiazepines	114	37%	105	34%	91	29%
Antipsychotics	110	36%	118	38%	82	27%
Statins	112	36%	98	32%	100	32%
Chemotherapy drugs	142	46%	104	34%	64	21%
Antidepressants	114	37%	104	34%	92	30%

that the mean level of knowledge of the group who agreed that MC should not be available on prescription was significantly lower compared to the group who agreed with the prescription, either by a GP (p value < 0.001 , one-tailed) or GP with training (p value < 0.001 , one-tailed), specialist ($p < 0.001$, one-tailed), or GP with shared care ($p < 0.001$, one-tailed) [Table 4].

Discussion

Based on the current findings, the majority of the sample, regardless of their position in the medical hierarchy, had a

knowledge deficit about the medicinal use of cannabis for specific indications. This finding is consistent with studies which highlighted a low knowledge score in physicians regarding MC in Norway,^[12] Israel,^[13] Canada,^[14] and Australia.^[9]

Nearly half of the current sample disclosed that they were uncomfortable to discuss the medicinal use of cannabis with their patients. This finding is similar to several non-regional studies. A systematic review of systematic reviews reported that the physicians had a low level of comfort to talk about MC use with their patients.^[9,15,16] Inadequate knowledge and discomfort

Table 3: Association of overall beliefs, attitude with knowledge about medical cannabis among physicians (n=310)

Variables	Level of knowledge				P*
	Insufficient knowledge		Sufficient knowledge		
	n	%	n	%	
Attitude Toward MC Prescription					
Restrictive Attitude Preferred					
Disagree	66	30%	33	36%	$\chi^2=1.67, P=0.43$
Uncertain	77	36%	35	38%	
Agree	74	34%	25	27%	
Non-Restrictive Attitude Preferred					
Disagree	86	40%	10	11%	$\chi^2=1.67, P<0.001$
Uncertain	61	28%	25	27%	
Agree	70	32%	58	62%	
Belief About MC					
Disagree	30	14%	2	2%	$\chi^2=29.9, P<0.001$
Uncertain	106	49%	26	28%	
Agree	81	37%	65	70%	
Knowledge of MC					
Indications					
Disagree	54	26%	0	0%	$\chi^2=65.5, P<0.001$
Uncertain	79	38%	14	15%	
Agree	73	35%	78	85%	
Side Effects					
Disagree	16	7%	1	1%	$\chi^2=13, P<0.001$
Uncertain	59	27%	13	14%	
Agree	142	65%	79	85%	
Harm Compared to Other					
Disagree	59	27%	15	16%	$\chi^2=20.7, P<0.001$
Uncertain	109	50%	33	36%	
Agree	49	23%	45	48%	
Improvement of Symptoms					
Disagree	59	27%	6	7%	$\chi^2=30, P<0.001$
Uncertain	68	31%	18	19%	
Agree	90	42%	69	74%	

*The Chi-square statistic is significant at the 0.05 level

Table 4: Association of knowledge with perception of right to prescribe MC (n=310)

Right to prescribe MC should be given to	n	Mean	SD	Std. error	95% Confidence interval for mean		P*
					Lower Bound	Upper Bound	
					All GPs	12	
Only GP with specific training	59	3.2502	0.41531	0.05407	3.142	3.3585	
Only GP in shared care with specialist	43	3.2695	0.38583	0.05884	3.1508	3.3882	
Specialists only	146	3.0804	0.41758	0.03456	3.0121	3.1487	
Should not be available on prescription	50	2.6564	0.59961	0.0848	2.486	2.8268	

MC: Medical cannabis, SD: Standard deviation, GP: General practitioners. *ANOVA test applied significant at <0.05

to discuss MC with patients are barriers to providing quality patient care services.^[4,16] Being comfortable with authorizing MC can be achieved with adequate training, guidelines for treatment protocols, and the availability of best clinical practices to physicians.

Almost half of the current sample (44%) had a knowledge deficit in terms of the effects of MC products, though half were specialists and consultants. Similarly, more than half indicated that they were unaware of the different MC products and formulations currently available and were uncertain of the

sufficiency of the scientific evidence about the efficacy of MC. A low knowledge score is frequently reported for physicians globally,^[9,16-18] emphasizing the necessity of advanced training, and the lack of continuing medical education opportunities about MC for healthcare personnel in Saudi Arabia. As physicians cannot rely on informal information sources, such as the news or general social media platforms, the necessity to educate physicians about MC must be presented in specialized educational presentations and information podia, structured by the medical professional organizations. In terms of the statement that there is little difference between “street cannabis” and MC products, 41%

disagreed, 30% were not able to decide, and 29% agreed. Even though the hair of humans or domestic animals is frequently found in street cannabis, it is not potentially harmful. According to the literature, the addition of chalk, sand, and tiny glass fragments contributes to the required appearance and increases the density. Lead has also been used in street cannabis to increase the weight, which could result in poisoning the consumers.^[19] Dangerous drugs or plants are also added to street cannabis,^[10] providing evidence that there is a huge difference between cannabis of medicinal grade and that available in the streets.

Most of the sample in the current study indicated that MC was safer than chemotherapeutic agents, followed by prescription opioids, benzodiazepines, and antidepressants. This is in line with a 2018 study by Karanges *et al.*,^[9,20] exploring the knowledge and attitude of Australian physicians regarding MC. The opinion of the comparative safety of MC, in contrast to benzodiazepines and prescription opioids, might reflect its insignificant mortality rate and comparatively mild dependence.^[20] However, cannabis can undoubtedly cause dependence, according to an American study investigating the indicators of cannabis-related problems and their effects on treatment outcomes.^[21] The current findings indicated that the physician's belief that MC is generally more hazardous than other drugs such as benzodiazepines, opioids, antipsychotics, statins, and chemotherapy was significantly associated with adequate knowledge about MC, in contrast to the group with inadequate knowledge (48% vs. 23%, $P < 0.001$).

In the current study, the majority supported the use of MC when evidence-based research supported the use, for example, chronic cancer pain and neuropathic pain, or where there were few effective alternatives available, for example, in end of life or palliative care.^[4,9,22] Concerns about the incorrect use, inadequate evidence of efficacy, and risk of deteriorating disease may be the cause of the low support for use in PTSD, anti-tumor effects, and insomnia.^[4,9] There is increasing evidence in the literature about the efficacy of MC in anxiety, chemotherapy-induced nausea and vomiting, chronic neuropathic pain, insomnia, multiple sclerosis, and resistant pediatric epilepsy. However, systematic and quality research is essential to establish the safety and efficacy in several chronic diseases.^[23] The current findings indicated that the level of knowledge about the indications of MC was significantly associated with adequate knowledge about MC, in contrast to the group with inadequate knowledge (85% vs. 35%, $P < 0.001$).

A systematic review reported critical undesirable psychiatric effects, including anxiety, mania, psychosis, and severe dysphoric reactions.^[23] Insignificant dose-dependent side effects include dizziness, dry mouth, nausea, and somnolence. In addition, neurocognitive as well as non-cognitive side effects have been reported.^[16] The current study indicated that the side effects of MC, endorsed by more than half of the sample, included addiction and dependence, driving impairment and cognitive impairment, comparable with previous studies.^[9] Half the sample indicated psychosis as a major side effect and less than half other long-term mental health issues,

the impact on the developing brain, interactions with other medications, and weight gain as side effects. These findings indicate that the sample was knowledgeable about the adverse effect profile of cannabis. Similar findings were reported in the literature.^[3,24-26] The knowledge about the side effects of MC was significantly associated with adequate knowledge about MC, in contrast to the group with inadequate knowledge (85% vs. 65%, $P < 0.001$).

The group who agreed with a non-restrictive attitude toward the prescription of MC had significantly ($p < 0.001$) better knowledge, compared to the restrictive group (32% vs 62% and 40% vs 11%, respectively). A similar association between knowledge and attitude has been reported in Spanish nursing students.^[27] It is noteworthy that the source of information plays a major role in articulating knowledge and attitude to certain topics.^[28] It is important to assess the knowledge and beliefs of health professionals regarding MC. Without the support of these vital stakeholders, patients who may benefit from MC may not be treated. Implementing strategies to change the behavior of healthcare personal is essential. The current research indicated a significant association between a positive belief and sufficient knowledge regarding MC, in contrast to the group with inadequate knowledge (70% vs. 37%, $P < .001$). A Minnesota-based survey revealed that healthcare professionals generally believed that MC is a legitimate medical treatment; however, a small number believed that MC improved the quality of life domains of the patient.^[29]

The current findings indicated that MC could improve mood (30% a great deal; 28% somewhat) and improve the feeling of enjoying life (27% to a great deal; 29% somewhat). A smaller proportion indicated that MC could improve social engagement, energy, ability to work, and physical function. A prospective cohort survey was conducted to investigate the safety of MC for chronic non-cancer pain.^[30] The study reported that MC use was associated with an improvement in cognitive function, physical function, pain, and quality of life. Similarly, an observational study reported that treatment with inhaled cannabis improved the patients' quality of life, their ability to uphold a social life, completing routine activities and their general health status. However, the current findings suggested that the belief in the extent of improvement of symptoms was significantly associated with adequate knowledge about MC, in contrast to the group with inadequate knowledge (74% vs. 42%, $P < 0.001$).

Glickman and Sisti reviewed the ethical considerations of prescribing MC by primary healthcare professionals.^[31] The study indicated that cannabis is not a normal medication to be prescribed, but a multifaceted category of therapies which should be managed and adjusted in cooperation with individual patients. The healthcare personnel must cautiously gather data of their patients as they develop patient-centered therapy plans for the indications of MC. The current study investigated the opinions regarding right to prescribe MC and the majority believed that

the right to prescribe must be for specialists only. The sample also indicated that the right to prescribe MC must be provided to GPs with specific training, a small proportion indicated only GPs in “shared care” with a specialist and lastly all the GPs must have right to prescribe MC. However, a group also indicated that MC should not be available on prescription.

The findings of this study must be considered in the context of some limitations. The primary limitation is the limited sample size. The responses of the sample do not represent physicians working in another region of Saudi Arabia. The responses may vary from a physician working in primary care, tertiary care, or any other healthcare facility, and the findings cannot be generalized to the whole population of physicians. The study did not include other healthcare personnel such as pharmacists, nurses, and physiotherapists. Despite these limitations, this research initiative provides unique results about the knowledge, attitudes, and beliefs of physicians regarding MC that may contribute to national policy as well as the medical education curriculum about cannabis.

Conclusion

In conclusion, the majority of the sample had a knowledge deficit about the medicinal use of cannabis for specific indications, its effects, and the different products and formulations currently available. The low level of knowledge highlights the lack of continuing medical education opportunities about MC for healthcare personnel in Saudi Arabia. Inadequate knowledge and discomfort when discussing MC with patients are barriers in the provision of quality patient care services. We recommend the provision of adequate clinical training, guidelines for treatment protocols, and the availability of best clinical practices for the physicians.

Key messages

1. The majority of the sample lacked knowledge.
2. The majority of the sample is uncomfortable to discuss it with the patients.
3. We recommend the availability of best clinical practices for the physicians.

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Conflicts of interest

There are no conflicts of interest.

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