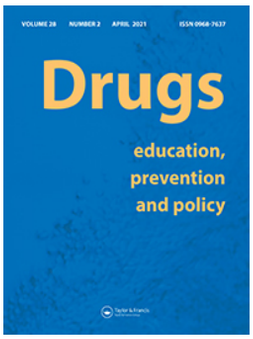

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Assessment of Norwegian physicians' knowledge, experience and attitudes towards medical cannabis

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ABSTRACT

Background: Medicinal cannabis (MC) has been used extensively throughout history. However, its criminalization in the United States in 1937 spurred the international community to follow suit, including Norway. Despite being reintroduced as a medical treatment in many countries in recent years, the use of MC in Norway is confined to a select few patient groups, and medical specialists must formally apply for authorization from the Norwegian authorities to prescribe the drug.

Objective: To assess Norwegian physicians' perceived knowledge of, experience with, and attitudes towards MC.

Methods: A cross-sectional survey consisting of 31 closed-ended items captured physicians' perceived knowledge of, experience with, and attitudes towards this treatment.

Results: A total of 102 physicians participated in this study. Physicians generally agreed that MC is a legitimate treatment option ($n = 45$, 44.1%), that it represents a therapeutic agent for treating cancer and chemotherapy-induced side effects ($n = 88$, 86%), and that it has the potential to reduce unnecessary opioid use in patients with chronic pain ($n = 40$, 39.2%). Statistically significant differences were found between subgroups in the sample in terms of years of practice, specialty, age, country the medical diploma was obtained from, and practice type.

Conclusions: This study found acceptance of cannabis as a therapeutic agent as well as acceptance towards MC being introduced by prescription in Norway. Further large-scale in-depth studies on provider perspectives towards MC are warranted.

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Introduction

Medical cannabis (MC) is a treatment option currently under discussion by academicians, health professionals, and policy-makers in many countries, including Norway (Kristensen & Mlodozeniec, 2017; Pisanti & Bifulco, 2017). Despite widespread prohibition, numerous patient groups have reported using cannabis for analgesia and psychological relief (Clark et al., 2004). To date, 29 states in the United States have introduced cannabis for medicinal purposes, with several states expecting to do so in the future (Sarvet et al., 2018). Moreover, more than 20 countries in Europe and several in Latin America have granted regulatory approval for cannabis-based formulations for medicinal purposes (European Monitoring Centre for Drugs & Drug Addiction, 2016).

The research on physicians' attitudes towards, experience with, and perceived knowledge of MC shows that it is a legitimate treatment option. The most notable potential therapeutic effects of cannabis have been reported for palliative care (Nussbaum et al., 2011; Whiting et al., 2015), cancer (Doblin & Kleiman, 1991; Nussbaum et al., 2011; Robson, 2001), chronic arthritis (Blake et al., 2006), neuropathic pain (Abrams et al., 2007; Boehnke et al., 2016; Bushlin et al., 2010; Donvito et al., 2018; Nussbaum et al., 2011; Ware et al., 2010; Wilsey et al., 2008), and multiple sclerosis (Consroe et al., 1997; de Lago & Fernández-Ruiz, 2007; Kavia et al., 2010; Killestein et al., 2002; Robson, 2001; Whiting et al., 2015). Studies have indicated that physicians perceive the consumption of cannabis to cause adverse effects, most notably on mental health, but that they did not believe it to be addictive. (Budney et al., 2004; Hall, 2015; Schlossarek et al., 2016). In these studies, physicians thought MC should be available by prescription. However, a few studies have reported that physicians were unsure or undecided on the matter (Charuvastra et al., 2005; Kondrad & Reid, 2013).

Previous studies have demonstrated that the legalization of MC has had no significant impact on public health and safety, consumption, or related adverse effects (Hall & Weier, 2015; Nussbaum et al., 2011; Rubens, 2014; Sznitman & Zolotov, 2015; Ziemianski et al., 2015). Moreover, the legal introduction of MC has been reported to increase safety and awareness among patients, as users are no longer breaking the law (Troutt & DiDonato, 2015). Such findings partially provide the basis for the ongoing shift in attitudes among governments around the world towards reintroducing MC.

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Healthcare providers have voiced concerns in relation to prescribing MC. The most cited barriers for prescribing MC are the potential for increased drug abuse and the lack of clinical guidelines and knowledge in relation to dosage and potency (Carlini et al., 2017; Kondrad & Reid, 2013; Michalec et al., 2015; Ziemianski et al., 2015). In addition, physicians have raised concerns about recreational use (Ablin et al., 2016; Carlini et al., 2017; Ebert et al., 2015; Michalec et al., 2015; Ziemianski et al., 2015). There is a general trend in the literature that most physicians consider their current knowledge on MC to be moderate. The sources of information by which physicians obtained their knowledge on MC varied considerably between studies and included the medical literature, lectures, seminars, news media, and other physicians (Ebert et al., 2015; Hall, 2015; Schlossarek et al., 2016). The current literature provides robust evidence that physicians desire more education on MC (Kondrad & Reid, 2013; Kweskin, 2013).

The Norwegian healthcare system is founded on the principles of universal access, decentralization, and free choice of provider. The system is financed by taxation together with income-related employee and employer contributions and out-of-pocket payments (copayments) (Tynkkynen et al., 2018). All residents are covered by the National Insurance Scheme, which is managed by the Norwegian Health Economics Administration. Private medical insurance is limited. The Ministry of Health and Care Services (MOH; the legislative authority) and the Norwegian Medicines Agency (NMA; subordinate to the MOH) are the main actors in charge of marketing authorization, classification, vigilance, pricing, reimbursement, and providing information on medicines to prescribers and the public (Ringard et al., 2013). In 2016, the NMA formalized new guidelines which enable specialists to apply for permission to prescribe MC to patients. This application process is strictly regulated, and only a small number of patients have been granted approval to receive cannabis as medical treatment in Norway since 2016 (NMA, 2018; Stortinget, 2017; Teigen et al., 2019).

Considering MC is not readily available for patients in Norway, it is compelling to study what Norwegian physicians view as prominent barriers to making such a potential policy change. To the best of our knowledge, no such study has been conducted on physicians in Scandinavia, let alone in Norway. This study aims to shed light on this field of study by exploring the attitudes, experiences, and perceived knowledge of Norwegian physicians. Moreover, uncovering the perspectives of physicians within a healthcare system that has yet to make MC readily available to patients provides valuable and much needed insight not only for the Norwegian healthcare system but also for others in countries that are currently debating and revising drug policies. In light of this, this research will provide answers for the following research questions: 1) Do physicians in Norway view cannabis as a legitimate treatment option, and for what medical conditions may cannabis hold therapeutic value? 2) What is the position of physicians in Norway towards introducing MC by prescription, and what are the justifications for their stance?

Materials and methods

Sample

This study was carried out at Oslo University Hospital (OUS). OUS is publicly owned and serves as a local and acute hospital for the majority of Oslo's population. A non-random convenience sample of 334 physicians was identified from the hospital. The electronic questionnaire was sent to all department heads across the hospital, who distributed it to sampled physicians. The study was approved by the Norwegian Centre for Research prior to the distribution of the survey instrument.

Instrument

A self-administered closed-ended questionnaire consisting of four parts was used in the study. The design of the electronic survey instrument was based on previous research studies (Ablin et al., 2016; Ebert et al., 2015; Michalec et al., 2015; Ziemianski et al., 2015) and modified for the Norwegian healthcare system and the legislation surrounding MC in Norway. The electronic survey contained four sections and had 31 items.

The first section concentrated on perceived knowledge of MC and contained 10 closed-ended questions. The second section entailed questions on the experience of physicians with MC in a clinical setting. The third section included 11 closed-ended questions in order to capture physicians' attitudes towards MC. The fourth section collected demographic data, such as age, gender, country where the medical diploma was received, specialty, and number of years in practice.

The survey instrument was reviewed for construct validity by five physicians working at a local hospital in Oslo in order to make any necessary adjustments to both the instrument and its instructions. In accordance with their comments, minor changes were made to the original survey instrument, mostly in relation to medical terminology but also in regards to the overall functionality of the instrument.

Data collection

In February and March of 2018, the electronic survey was distributed to 20 department leaders at OUS, who forwarded the questionnaire to 334 physicians working in their departments. Of these, 114 responded (34.1% response rate). No incentive or compensation was provided for participation. Twelve physicians did not provide enough answers and were therefore excluded from the subsequent analysis.

Statistical analysis

Data were stored in Microsoft Excel 2016 and SPSS (version 25). All variables were analyzed using frequencies, means, proportions, standard deviations, and percentages. The chi-square test, independent *t*-test, and one-way ANOVA were used to test the research questions in the analysis. Characteristics of physicians and groups of physicians were

described, and inferential statistics were utilized to compare answers between groups. Statistical significance was defined as a *p*-value less than .05.

Results

Females ($n = 58$) constituted 56.7% of the sample (44 males or 43.1%). About 55% of physicians in Norway are female (Statistics Norway, 2020). The mean age of the participants was 44.80 ± 9.12 years. Over half of the sample ($n = 63$, 62.0%) were 44 years or younger, whereas 37.6% ($n = 38$) were 45 years or older. The mean number of practice years was 15.70 ± 10.11. More than half of the sampled physicians ($n = 58$, 58%) had 16 or less years of practice, while 42% ($n = 42$) had 17 or more years of practice. Of the participating respondents, 65 (63.7%) were specialists, 35 (34.3%) were physicians currently undergoing specialist training, and two physicians did not state their status.

The majority ($n = 70$, 70.2%) of physicians ranked their current level of knowledge on MC as a treatment option as either no knowledge ($n = 23$, 23.7%) or little knowledge ($n = 47$, 46.5%). The physicians who obtained their medical diploma abroad ($n = 22$, 22.2%) registered having greater knowledge on MC ($\bar{X} = 2.2 \pm 1.0$) compared with physicians trained in Norway ($n = 77$, 77.7%; $\bar{X} = 2.1 \pm 0.8$) ($p < 0.05$).

The respondents did, however, report to be familiar with the adverse effects of cannabis ($\bar{X} = 3.1 \pm 0.9$) (Table 1). The physicians undergoing specialist training ($\bar{X} = 2.12 \pm 1.14$) reported being more familiar than specialists ($\bar{X} = 1.78 \pm 0.82$) on the Endocannabinoid system (ECS) ($p < 0.05$). Regarding the question 'To what extent are you familiar with the dosage of MC?', male physicians ($\bar{X} = 1.7 \pm 0.96$) reported being more familiar with MC dosage compared with female physicians ($\bar{X} = 1.38 \pm 0.64$) ($p < 0.05$). In addition, doctors currently undergoing specialist training ($\bar{X} = 3.41 \pm 0.85$) were more familiar with the adverse effects of cannabis than specialists ($\bar{X} = 2.93 \pm 0.94$) ($p < 0.05$).

The most frequently reported source of information that the physicians obtained their knowledge of MC from was news and television ($n = 70$, 39.5%), followed by medical literature ($n = 48$, 27.1%), healthcare providers ($n = 30$, 16.9%), lectures and seminars ($n = 13$, 7.3%), and friends and family ($n = 12$, 7.3%). Three physicians indicated other sources of information such as patients, documentaries, and travelling.

The most prominently indicated adverse effects of cannabis consumption were psychosis ($n = 73$, 14.1%), hallucinations ($n = 67$, 12.9%), addiction ($n = 66$, 12.7%), anxiety ($n = 59$, 11.4%), dizziness ($n = 55$, 10.6%), depression ($n = 53$, 10.2%), impaired memory ($n = 52$, 10.0%), dry mouth ($n = 41$, 7.9%), respiratory diseases ($n = 32$, 6.1%), and cancer ($n = 15$, 2.9%). Four physicians (0.7%) each provided one additional category: concentration problems, listlessness, impair coordination, and abdominal pain.

The majority of respondents noted the therapeutic value of MC for cancer and chemotherapy-induced side effects ($n = 88$, 88%). This was followed by multiple sclerosis ($n = 64$, 64.0%), side effects of HIV/AIDS ($n = 43$, 43.0%), rheumatic disease (e.g. arthritis and ulcerative colitis) ($n = 42$, 12.2%), Parkinson's ($n = 19$, 5.6%), glaucoma ($n = 16$, 4.7%), anorexia ($n = 14$, 4.1%), epilepsy ($n = 11$, 3.2%), eating disorders ($n = 11$, 3.2%), and depression ($n = 7$, 2.0%). Two physicians (0.5%) felt that cannabis has no therapeutic effects. In addition, five physicians (1.4%) indicated additional categories that can be treated by MC: spasticity ($n = 1$), chronic pain ($n = 3$), and post-traumatic stress disorder ($n = 1$).

In terms of the physicians' experience with MC, 27 physicians (26.5%) reported that they treated patients for the adverse effects of cannabis, 4 physicians (3.9%) informally recommended cannabis to patients, and 22 physicians (21.6%) reported they were consulted by patients or next of kin about MC. Of these, the majority ($n = 20$, 90.1%) were approached by 10 or fewer patients or next of kin. Specialist physicians ($\bar{X} = 3.26 \pm 1.19$) were more likely to agree that cannabis is a legitimate treatment option compared to doctors undergoing specialist training ($\bar{X} = 2.58 \pm 1.28$) ($p < 0.05$) (Table 2).

The main justifications for not making cannabis available by prescription in Norway included risk of increased drug abuse ($n = 19$, 33.3%), the adverse effects of cannabis ($n = 19$, 33.3%), the lack of information about cannabis as a treatment option ($n = 13$, 22.8%), the perception that cannabis has no therapeutic effects ($n = 1$, 1.7%), and the belief that cannabis bears too much stigma ($n = 1$, 1.7%).

The physicians were asked to choose justifications for why cannabis should be available by prescription in Norway. Of the physicians who felt that MC should be available by prescription ($n = 25$, 24.5%), the majority stated that cannabis may improve the quality of life for patients with chronic pain ($n = 19$, 28.7%), the current legislation inhibits patients from

Table 1. Physicians' perceived knowledge on central medical cannabis-related topics.

	Very little extent		Little extent		Neutral		Great extent		Very great extent			
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	Mean	SD (+/−)
To what extent are you familiar with the endocannabinoid system?	43	43	32	32	19	19	5	5	1	1	1.8	0.9
To what extent are you familiar with the legislation on medical cannabis in Norway	43	42.5	33	32.6	18	17.8	6	5.9	1	0.9	1.9	0.9
To what extent are you familiar with the process of prescribing medical cannabis in Norway?	53	51.9	38	37.2	9	8.8	1	0.9	1	0.9	1.6	0.7
To what extent are you familiar with the dosage of medical cannabis?	64	62.7	23	23.4	8	7.8	2	1.9	1	0.9	1.5	0.8
To what extent are you familiar with the adverse effects of cannabis?	4	3.9	24	23.5	37	36.2	33	32.3	4	3.9	3.1	0.9

Table 2. Physicians' concerns about medical cannabis and its applicability.

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree			
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	Mean	SD (+/−)
Cannabis is a legitimate treatment option.	19	18.6	9	8.8	29	28.4	22	21.5	23	22.5	3.2	1.3
Physicians in Norway should receive more education on medical cannabis.	6	5.8	5	4.9	19	18.6	38	37.2	34	33.3	3.8	1.1
Medical cannabis may reduce unnecessary use of opioids in patients with chronic pain.	7	6.8	6	5.8	49	48.0	28	27.4	12	11.7	3.3	0.9
Cannabis should be available by prescription in Norway.	17	16.8	12	11.8	40	39.6	15	14.8	17	16.8	3.0	1.2
Physicians in Norway should have significant influence on future changes in legislation regarding medical cannabis.	3	2.9	4	3.9	21	20.5	35	34.3	39	38.2	4.0	1.0

optimal quality of care ($n = 17$, 25.7%), cannabis holds a wide range of therapeutic effects ($n = 16$, 24.2%), and cannabis may reduce unnecessary use of opioids ($n = 13$, 19.6%). One physician also stated that 'the current prohibitionist legislation is based on emotions rather than evidence.'

The most prominent barriers for making MC more accessible to patients were risk of increased drug abuse ($n = 50$, 17.7%), political resistance ($n = 51$, 18.1%), lack of clinical studies on the therapeutic effects of cannabis ($n = 48$, 17.0%), adverse effects of cannabis ($n = 44$, 15.6%), stigmatization of cannabis users ($n = 27$, 9.6%), lack of information on dosing MC ($n = 27$, 9.6%), uncertainty regarding the interaction with other drugs ($n = 27$, 9.6%), and financial expenses for patients ($n = 3$, 1.0%). Four physicians added the following additional barriers in the category of others: 'too little knowledge altogether on cannabis,' 'risk of prescribing cannabis for incorrect indications,' and 'risk of dealing.'

Regarding their attitudes towards prescribing MC, 37% of males ($n = 16$) indicated yes, and 18% ($n = 8$) indicated no to the question of whether they would prescribe MC if they were eligible to do so. For females, 22% ($n = 13$) indicated yes, and 32% ($n = 19$) indicated no to the same question. The remaining 44.1% of males ($n = 19$) and 44.8% of females ($n = 26$) answered that they were uncertain whether they would prescribe MC. Further, 38.2% ($n = 13$) of physicians who obtained their medical diploma in Norway indicated yes, whereas 61.7% ($n = 21$) indicated no. However, 69.2% ($n = 9$) of physicians with a medical diploma from overseas indicated yes, and 30.7% ($n = 4$) stated no.

Physicians willing to prescribe MC were more likely to agree with the statement 'MC is a legitimate treatment option' ($\bar{X} = 4.45 \pm 0.91$; $p < 0.05$). Moreover, these respondents were more likely to agree with the statements 'Physicians in Norway should receive more education on MC' ($\bar{X} = 4.52 \pm 0.63$, $p < 0.05$) and 'The use of MC may reduce the unnecessary use of opioids in patients with chronic pain' ($\bar{X} = 4.03 \pm 0.94$; $p < 0.05$). Moreover, they were more likely to agree with the statement 'MC should be available by prescription' ($\bar{X} = 4.34 \pm 0.76$; $p < 0.05$).

Discussion

The purpose of the research was to assess Norwegian physicians' perceived knowledge of, experience with, and attitudes towards MC. Based on results, the majority of the participating physicians reported to have very little knowledge about MC as a treatment option. This finding is comparable to several previous studies (Ablin et al., 2016; Fitzcharles et al., 2014; Michalec et al., 2015; Ziemianski et al., 2015), all of which found relatively low scores of knowledge on MC among physicians. Additionally, the current study revealed that physicians have very low knowledge on the ECS. This finding echoes that of previous research studies (Ablin et al., 2016; Fitzcharles et al., 2014).

The majority of participating physicians reported that they obtained their knowledge on MC through the news media, followed by medical literature and other healthcare providers. This may indicate that currently, in Norway, there are no continuing medical education opportunities related to MC for the physicians and they should be developed in the near future. Since physicians' information sources about MC cannot be news media, the need to inform physicians about MC should be met by educational programs and information platforms to be organized by medical professional organizations.

The results from the current study showed that the majority of participating physicians expressed being unfamiliar with the legislation surrounding MC in Norway and dosing of MC. Moreover, physicians were unanimously unfamiliar with the process of prescribing MC in Norway, which is explained by the fact that only a small number of physicians in Norway can prescribe MC to patients. This could suggest a lack of awareness among participants regarding the guidelines formalized by the NMA (2018) and the MOH.

Furthermore, the results of this study indicate that physicians in Norway are very familiar with the adverse effects of cannabis. Moreover, the majority of participating physicians indicated psychosis, addiction, and mental disorders (e.g. anxiety and depression) as the most prominent adverse effects associated with the consumption of cannabis. Similar findings were reported in Ireland, the USA, Canada, and Israel (Adler & Colbert, 2013; Ananth et al., 2018; Brooks et al., 2017; Carlini et al., 2017; Charuvastra et al., 2005; Crowley et al., 2017; Doblin & Kleiman, 1991; Ebert et al., 2015; Kondrad & Reid, 2013; Kweskin, 2013; Uritsky et al., 2011).

A small fraction of the sample in this study reported having informally recommended cannabis to patients.

Furthermore, one-fifth of respondents reported to have been approached by patients or next of kin wishing to consult them about MC. In the Canadian study by Ziemianski et al. (2015), as many as 79% of respondents reported being routinely approached by patients in order to discuss cannabis as a viable treatment option. Moreover, 84% of Israeli physicians in a previous study had been approached by 25 or more patients regarding MC (Ebert et al., 2015).

The majority of physicians in the current study tended to agree with the notion that MC is a legitimate treatment option. This finding is mirrored in most of the previous research on provider perspectives towards MC (Ablin et al., 2016; Adler & Colbert, 2013; Ananth et al., 2018; Carlini et al., 2017; Crowley et al., 2017; Doblin & Kleiman, 1991; Ebert et al., 2015; Uritsky et al., 2011). However, two studies reported that physicians did not recommend cannabis as a legitimate treatment option due to concerns that it is harmful to both physical and mental health (Kondrad & Reid, 2013; Kweskin, 2013).

According to the study results, slightly more than half (52%) of participating physicians agreed that prescription MC should be introduced in Norway versus 47% who opposed such a proposition. Most of the studies examining physicians' perspectives towards prescription cannabis demonstrated that the majority of physicians favored such a proposition (Carlini et al., 2017; Crowley et al., 2017; Doblin & Kleiman, 1991; Uritsky et al., 2011; Ziemianski et al., 2015).

Limitations

The main limitation of the current research study lies in its low response rate and small sample size. Further, the results of this sample cannot be generalized to represent the entire population of physicians in Norway. An additional limitation of this study is the narrow spectrum of specialties in the sample. Despite the limitations of this research, the current study is the first of its kind in Norway and should be taken into account when new legislation and regulations surrounding MC are considered. More clinical studies are needed in order to reach conclusive evidence regarding both the therapeutic and adverse effects attributed to cannabis use in order to facilitate evidence-based clinical decision making on MC as a treatment option.

Conclusion

This study is unique in terms of providing an account of the perspectives of physicians in Norway towards MC, and it is one of few studies available assessing physicians' views on this topical issue. Because of the lack of knowledge and education on MC, the majority of the respondents in this study displayed having very little knowledge of MC as a treatment option, which is a recurring finding among previous studies in other countries. Despite their limited knowledge, the majority of participants viewed MC as a legitimate treatment option and agreed that it should be accessible by prescription in Norway. Physicians also indicated that 1) cannabis has a wide range therapeutic effects, 2) the current legislation inhibits patients from optimal quality of care, 3) cannabis may reduce unnecessary use of opioids, and 4) cannabis may improve the quality of life for patients with chronic pain. As expert opinions, these justifications provide vital information in relation to future debates surrounding the availability of MC by prescription.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Author contributions

All authors have equal contributions.

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