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South African retail pharmacists' knowledge of cannabidiol and cannabis, and training recommendations

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Background: With the evolving legal landscape in South Africa, cannabidiol (CBD) and non-medical cannabis products are increasingly available, posing challenges for healthcare professionals. Retail pharmacists, as key figures in patient care, face a critical knowledge gap in providing informed advice on these products. This study assessed the attitudes and clinical knowledge of retail pharmacists in South Africa regarding the recommendation and patient counselling with respect to CBD and non-medical cannabis.

Methods: A cross-sectional quantitative design study was conducted, using an online survey to evaluate pharmacists' knowledge and attitudes towards CBD and non-medical cannabis. A sample of 178 pharmacists provided a statistical power of 0.997, ensuring robust results.

Results: While 69% of pharmacists recognised CBD's therapeutic potential, 63% felt unprepared to recommend it because of insufficient knowledge and 60% cited a lack of resources in their pharmacies. Only 13% scored above 50% in the knowledge assessment, which included legislative and clinical understanding related to CBD and non-medical cannabis, with 31% reporting no formal training to educate themselves on CBD products.

Conclusion: This study highlights the need for targeted educational initiatives and clear South African Health Products Regulatory Authority (SAHPRA) guidelines to bridge knowledge gaps among retail pharmacists. Updated resources on CBD safety, interactions and therapeutic use are critical to empower pharmacists to deliver evidence-based counselling.

Contribution: The findings contribute to healthcare education, policy reform, and health promotion by emphasising the importance of equipping pharmacists with the tools necessary for safe and effective counselling on CBD and cannabis products.

Keywords: public health; cannabis education; CBD; pharmacist knowledge; healthcare policy; patient counselling.

Introduction

Cannabidiol (CBD), a non-intoxicating cannabinoid found in Cannabis sativa, has garnered significant attention for its potential therapeutic uses.[1] While there are over 100 cannabinoids in cannabis, delta-9-tetrahydrocannabinol (THC) is the primary psychoactive component responsible for its euphoric effects.[2]

Cannabis, or 'dagga', has deep cultural and medicinal roots in South Africa,[3] although it became heavily restricted by laws such as the 1922 South African Drugs and Drug Trafficking Act. However, in 2018, South Africa's High Court ruled that adults may cultivate cannabis for personal use.[4] In 2019, CBD was removed from the Schedule 7 register, allowing its limited medicinal use under guidelines from the South African Health Products Regulatory Authority (SAHPRA).[5] Cannabidiol is now classified as a Schedule 4 medicine; however, it can also be classified as a Schedule 0 medicine provided the complementary medicine incorporates no more than 600 mg of CBD per sales pack, offers a maximum daily dose of 20 mg of CBD, or endorses minor general health enhancement, health maintenance, or mild symptom alleviation through CBD use.[6]

Critical role of pharmacists in education and the rising interest in cannabidiol

Retail pharmacists play a vital role in safeguarding patient health, especially as cannabis and CBD products become more integrated into healthcare. With the increasing availability of these

products, pharmacists are often the first point of contact for individuals seeking informed advice. This evolving role underscores the need to assess whether pharmacists are adequately equipped to confidently recommend cannabis products. Addressing knowledge gaps is essential, as pharmacists' ability to provide accurate, evidence-based guidance significantly impacts individual health outcomes and shapes community perceptions of health and wellness. This study aims to empower pharmacists to prioritise patient safety while promoting responsible cannabis use.

Research from countries such as Canada and Australia reveals that pharmacists often have limited knowledge about cannabis. For instance, an Australian survey found that only 32.2% of pharmacists scored above 60% on cannabis knowledge assessments,[7] while a Colorado study found that 75% of pharmacists lacked understanding of medicinal cannabis.[8] Despite recognising the therapeutic benefits of cannabis,[8,9] pharmacists continue to express concerns about drug interactions, side effects and the risk of abuse.[9] Furthermore, many face challenges related to the legal complexities surrounding CBD and cannabis.[10,11] Continuous education and collaboration with regulatory bodies and professional organisations are essential to equip pharmacists with the necessary knowledge and skills to offer informed advice.

Pharmacists' knowledge and attitudes towards CBD and recreational cannabis have significant implications for patient counselling and medication management. As trusted sources of information, pharmacists often lack the knowledge needed to provide accurate guidance, which can hinder effective patient care.[12] Those with negative views on medicinal cannabis may be less likely to counsel patients, potentially limiting access to crucial information.[13] Furthermore, insufficient knowledge about CBD can obstruct pharmacists' ability to manage drug interactions, creating risks to patient safety.[14]

This study aims to evaluate the current knowledge and attitudes of pharmacists concerning CBD and non-medical (recreational) cannabis. By identifying the gaps in understanding and the confidence to counsel patients, the findings may help shape education and training programmes designed to better equip pharmacists for their expanding role in patient care.

Research method and design

Research design

This study employed a cross-sectional quantitative design, using a structured questionnaire to assess pharmacists' knowledge and attitudes towards CBD and recreational cannabis. Most items were measured on a Likert scale, ranging from 'strongly disagree' to 'strongly agree', enabling statistical analysis of perceptions, confidence levels and behaviours. A structured questionnaire, adapted from Nichols et al.[12] was used to assess pharmacists' perspectives regarding CBD and recreational cannabis. This allowed for quantitative analysis of trends in confidence, perceptions, and readiness to recommend or counsel on CBD and cannabis products. The sample size was determined using SurveyMonkey®, and the survey was structured to be completed within 10–15 min.

Research setting

The survey was distributed via email to retail pharmacists across South Africa through a retail pharmacy network.

Population and sample

The target population in this study consisted of all 470 pharmacies in the accessible network. Convenience sampling was applied. Based on a 95% confidence level and a 5% margin of error, the ideal sample size was determined to be 212. The sample size was calculated using the SurveyMonkey® calculator, based on the standard formula for finite populations (Equation 1):

$$n = [N \times Z^2 \times p(1-p)] \div [(N-1) \times E^2 + Z^2 \times p(1-p)] \quad \text{[Eqn 1]}$$

Where:

N = population size
Z = Z-value for 95% confidence
p = maximum variability
E = margin of error

Data collection

SurveyMonkey® was used to send 470 survey invitations, with reminder emails sent bi-weekly.

Data analysis

Data from SurveyMonkey® were cleaned, coded and analysed using IBM SPSS v27. Descriptive statistics were employed to summarise demographics as well as pharmacists' knowledge and attitudes towards CBD and recreational cannabis. Of the 212 respondents, 178 completed the full survey (83.9%). In addition to descriptive analysis, Chi-square tests of independence were conducted to assess associations between variables where applicable. A p-value of < 0.05 was considered statistically significant. Pearson's correlation analyses were also used to examine relationships between variables. A p-value of < 0.05 was considered statistically significant.

Ethical considerations

Ethical clearance was obtained from the Humanities and Social Science Research Ethics Committee of the University of Western Cape (approval number HS22/6/47). To maintain anonymity, no personal information about respondents was collected on the questionnaire. The fact that their participation was optional and that the information they provided would be kept private was made clear to the participants. Consent was obtained via the digital questionnaire form.

Results

Socio-demographic information

There were 178 valid responses in this study. Table 1 shows the demographic characteristics of the pharmacists. The

TABLE 1: Demographics and professional characteristics of retail pharmacists in South Africa.

Variable	Category	Frequency	
		n	%
Age (years)	18–34	92	51.6
	35–54	59	33.1
	> 55	27	15.3
Gender	Female	108	60.7
	Male	70	39.3
Highest qualification	Bachelor's Degree (BPharm)	153	86.0
	Diploma in Pharmacy	7	3.9
	Master's Degree	14	7.9
	Doctorate	2	1.1
	Other	2	1.1

TABLE 2: Pharmacists' attitudes and behaviours towards cannabidiol (N = 178).

Statement	Strongly disagree and disagree (%)	Neutral (%)	Strongly agree and agree (%)
CBD is beneficial to different illnesses	8	23	69
Discusses CBD products with patients	40	28	32
No hesitation in recommending CBD products	48	30	22
Requires further studies to be conducted before recommending CBD to patients	13	19	68
Customers would express dissatisfaction if CBD products were not recommended	62	24	14
Knowledge of pharmacy peers consistently recommending CBD products to patients	34	23	43
Sufficient knowledge to recommend CBD products to patients	63	21	16
Sufficient CBD-related materials in their pharmacy	60	15	12

CBD, cannabidiol.

sample predominantly comprised younger respondents aged 18–34 (51.6%), with a majority being female respondents (60.7%) and holding a bachelor's degree in pharmacy (86%).

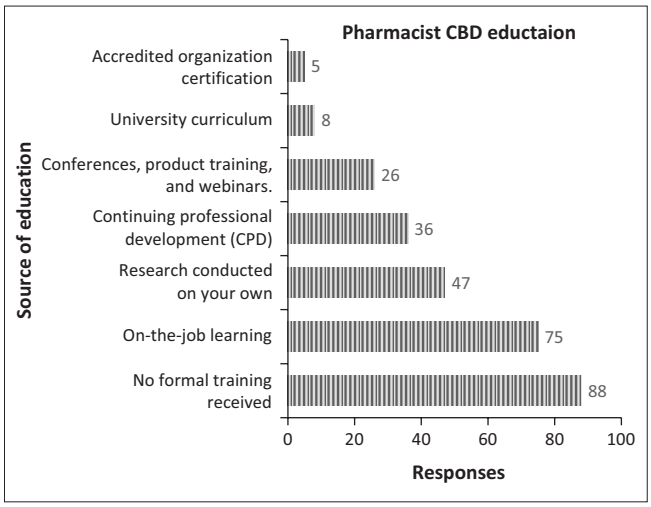
Pharmacists' attitudes and behaviours towards cannabidiol

The respondents were asked about their attitudes towards CBD products, with results summarised in Table 2.

Sixty-nine per cent of pharmacists believe that CBD holds therapeutic benefits for various illnesses. However, 40% expressed discomfort in advising patients on CBD products, likely because of the perceived need for more research, as observed by 50% of respondents. Furthermore, 63% of pharmacists reported feeling inadequately knowledgeable to confidently recommend CBD products. Around 60% stated a shortage of CBD-related resources, such as reference books detailing drug interactions and adverse effects. In addition, 48% of pharmacists expressed hesitancy in recommending CBD to their patients.

Statistical associations

A Chi-square test revealed a statistically significant association between age and the likelihood of recommending CBD (p = 0.021), indicating that younger pharmacists are more likely to recommend CBD products. However, no significant association was found between gender and CBD recommendations (p = 0.187). Pharmacists' qualifications also significantly impacted their likelihood of recommending CBD, with a Chi-square statistic of 28.14 and a p-value of 0.000088.



CBD, cannabidiol.

FIGURE 1: Sources of cannabidiol education.

Sources of cannabidiol education

Figure 1 illustrates the avenues pharmacists used to educate themselves on CBD products, with 31% (88) reporting no formal training, 26.5% (75) gaining on-the-job learning, 16.6% (47) conducting independent research, and 12.7% (36) participating in continuing professional development (CPD) training. Conferences, product training, and webinars accounted for 9.1% (26), while only 4.5% accessed university curriculum or accredited certification courses. Pearson's analysis revealed a positive correlation between attending CPD, conferences, independent research, and certification-based training and having sufficient knowledge to recommend CBD products (p < 0.001 for most sources). Conversely, pharmacists without formal education on CBD showed a negative correlation with sufficient knowledge to recommend CBD (p < 0.001).

Knowledge of cannabidiol among pharmacists

Knowledge of CBD was assessed through various questions related to its legality and interactions. The results are shown in Table 3.

Eighty-seven per cent of pharmacists scored below 40% on legislative and clinical knowledge assessments related to CBD. Notably, 69.2% scored between 0 and 10%, while only 13.3% scored above 50%. On legislative aspects, 55.3% incorrectly answered questions about CBD's classification as complementary medicine, while 46% were unsure about specific conditions for its use. Regarding clinical knowledge, 60.7% correctly identified that CBD lacks euphoric effects, but 78.7% were unaware of Cytochrome P450-mediated drug interactions, a critical safety consideration. Pearson's and Chi-square analyses indicated a significant association between pharmacists' qualification level and higher knowledge scores (p < 0.001), suggesting that formal education plays a key role in knowledge acquisition. However, no significant correlation

TABLE 3: Retail pharmacist cannabidiol knowledge.

Question number	Question or statement	Correct		Incorrect		Did not know answer	
		n	%	*n*	%	*n*	%
1.	CBD extracted from Cannabis sativa with less than 0.001% THC ('hemp') is not categorised as a regulated substance.	45	30.0	83	55.3	22	14.7
2.	Are food items legally permitted to include CBD sourced from hemp?	20	13.3	98	65.3	32	21.3
3.	Under what conditions is CBD regarded as a complementary medicine?	30	20.0	61	40.6	69	46.0
4.	CBD causes euphoric effects.	91	60.7	45	30.0	14	9.3
5.	Which is the most important cytochrome P450 drug interaction associated with CBD?	31	20.7	16	9.0	118	78.7

CBD, cannabidiol; THC, tetrahydrocannabinol.

TABLE 4: Pharmacists' attitudes towards recreational cannabis (N = 146).

Statement	Strongly disagree/disagree		Neutral		Strongly agree/agree	
	n	%	*n*	%	*n*	%
Favour the current legalisation of recreational cannabis	41	28.0	41	28.0	64	44.0
Recreational cannabis has become more acceptable to use now	13	8.9	25	17.1	108	74.0
Comfortable talking to patients about their recreational cannabis use	55	37.7	44	30.1	47	32.2
Have sufficient knowledge to answer patient questions on recreational cannabis	93	63.7	30	20.5	23	15.8
Believe there are pharmacological benefits using recreational cannabis	27	18.5	38	26.0	81	55.5
Current legislation should be changed so that only pharmacists can dispense recreational cannabis and cannabis-containing products to patients	25	17.1	34	23.3	87	59.6

was found between age and overall knowledge scores, despite age being linked to the likelihood of recommending CBD.

Pharmacists' attitudes towards recreational cannabis

In Table 4, 44% of pharmacists supported the current legalisation of recreational cannabis, while 28% opposed it. A majority (74%) believed recreational cannabis use has become more socially acceptable, yet 38% felt uncomfortable discussing cannabis use with patients. In addition, 64% reported insufficient knowledge to address patient inquiries about cannabis use, and 56% acknowledged its pharmacological benefits. Furthermore, 60% of pharmacists favoured legislative changes to grant pharmacists exclusive control over cannabis sales.

Discussion

Knowledge gaps and educational needs

Our study revealed substantial knowledge gaps among pharmacists regarding CBD and cannabis, with 63% reporting insufficient knowledge to confidently recommend CBD products. This aligns with a study in Australia, where only 39.3% of pharmacists felt confident addressing cannabis-related inquiries.[7] Pharmacists scored poorly on legislative and clinical knowledge assessments, with notable deficits in understanding Cytochrome P450-mediated drug interactions (78.7%) and legislative nuances (55.3%). This limited understanding may stem from the lack of formal cannabis-related education in pharmacy curricula, as highlighted in previous studies from Australia and the USA,[7,8,15] where pharmacists also reported inadequate training and limited exposure to clinical guidelines on cannabis.

By addressing these knowledge gaps, pharmacists can play a pivotal role in promoting health within communities. Enhanced knowledge ensures pharmacists can guide patients responsibly, mitigating risks associated with misuse while fostering health-promoting behaviours. This contributes to the broader public health goal of ensuring the safe and informed use of cannabis and CBD products.

Impact of education and training

A significant relationship was observed between formal education, CPD training and sufficient knowledge. Pharmacists who received accredited training with certification demonstrated higher confidence in CBD counselling and better access to resources ($p < 0.05$). This is likely because structured educational programmes offer evidence-based content that clarifies complex clinical and legal concepts such as pharmacological mechanisms, drug interactions and regulatory classifications. Conversely, those without formal CBD education felt less prepared, highlighting the need for structured educational initiatives, possibly as a result of relying on informal or inconsistent sources of information which contributes to uncertainty and a lack of clinical authority. Resource development efforts should focus on creating user-friendly reference guides and digital tools that provide information on product formulations, interactions and legal classifications.

This is consistent with previous research outside of South Africa,[16,17] emphasising the importance of education in improving pharmacists' competence and attitudes.

Collaboration between regulatory bodies and healthcare systems is vital to develop clear guidelines and accessible resources for pharmacists. Such efforts will bolster public health infrastructure and support pharmacists' roles as key contributors to societal awareness of cannabis use.

Generational and qualification influences

Generational differences significantly influenced CBD recommendations ($p = 0.021$), with younger pharmacists more likely to recommend these products. This may reflect their greater exposure to cannabis education and openness to

new therapies. Similarly, higher qualifications were positively associated with CBD recommendations ($p < 0.05$), underscoring the importance of advanced education in shaping pharmacists' expertise. These trends are consistent with international studies conducted in countries such as Australia, the USA and Canada, where legalisation of cannabis products has been in place longer.[7,8,9,12] These studies found that younger pharmacists and those with postgraduate training were more likely to engage with cannabis-related knowledge and recommendations. While South Africa's regulatory framework is relatively new, these findings suggest a global pattern, highlighting the importance of proactive curriculum development.

Regulatory and resource challenges

Resource shortages (reported by 60% of pharmacists) and regulatory ambiguity emerged as major barriers to effective CBD counselling, as seen in studies conducted in Australia[7] and Canada.[9] Concerns about regulatory compliance echo these findings,[18,19], which highlight the need for standardised guidelines and updated resources.[7,12] Addressing these challenges is critical to equipping pharmacists with the tools and confidence needed for safe and effective patient counselling.

Attitudes towards cannabis and professional roles

Our study showed mixed attitudes towards recreational cannabis, reflecting broader societal shifts. While 74% of pharmacists acknowledged increasing acceptance of its use, only 44% supported its current legalisation and 38% expressed discomfort in discussing cannabis use with patients. This finding is consistent with international research. Kondrad and Reid in the USA and Bawa et al. in Australia also reported that pharmacists often support the therapeutic potential of cannabis but hesitate to counsel patients because of limited training, legal ambiguity, and fear of professional scrutiny.[7,8] This may be because of historical stigma surrounding cannabis still influencing professional attitudes, particularly in regions where legal reform is recent. Furthermore, ongoing uncertainty around the legal boundaries of what pharmacists are permitted to say or do may lead to reluctance. Thirdly, many pharmacists may feel unprepared to initiate sensitive conversations because of a lack of training in patient communication on controversial health topics. As such, discomfort is likely the result of both systemic gaps (e.g. training, regulation) and personal factors (e.g. generational attitudes, cultural perceptions).

This underscores the importance of communication-focused training in pharmacy education as well as clearer regulatory guidance and institutional support to foster open, informed discussions between pharmacists and patients.

Recommendations based on the study's research outcomes

To achieve both immediate and long-term advancements in CBD education and practice, a strategic focus on structured learning, resource development, and collaboration is essential.

Health promotion and disease prevention

Pharmacists play a critical role in guiding the safe and effective use of CBD and cannabis for therapeutic purposes. In the short term, implementing CPD modules can address critical knowledge gaps. These modules should include structured courses on CBD pharmacology, therapeutic uses, legal considerations, drug interaction management, and patient counselling techniques. Practical learning can be enhanced through real-life case studies and simulation-based modules, with interactive platforms offering expert-led discussions and role-playing exercises, available both online and through in-person workshops. These initiatives will contribute to safer patient care, promoting health and preventing misuse.

Public health and resource development

Retail pharmacists have the potential to significantly impact public health by addressing knowledge gaps around cannabis – a topic of growing importance in healthcare. Resource development efforts can support this by creating comprehensive guides and digital tools, such as mobile apps or online databases, to provide pharmacists with real-time information on CBD products and interactions. Awareness campaigns should also be launched to emphasise the importance of CBD education and encourage active participation among pharmacists. These strategies aim to empower pharmacists to better serve their communities and promote healthier cannabis use practices.

Health policy and systems

A key aspect of advancing CBD education involves integrating it into undergraduate and postgraduate pharmacy curricula. This long-term goal includes detailed content on clinical applications, legal aspects, and patient counselling strategies. Furthermore, partnerships with regulatory bodies, such as the SAHPRA, will be vital in creating a robust regulatory framework for cannabis products. This includes ensuring quality, safety, and consistency through clear labelling standards, rigorous testing, and a transparent supply chain.

Global health and regulatory collaboration

The changing legal status of cannabis in South Africa reflects broader global trends and geopolitical influences on healthcare practices. Joint initiatives by SAHPRA and South African Pharmacy Council (SAPC) can create a synergistic system for regulatory oversight and professional development, ultimately enhancing the role of pharmacists in the evolving landscape of CBD education and practice. This can help ensure compliance with regulatory standards while equipping pharmacists for effective cannabis dispensing and counselling.

Conclusion

This study highlights the vital role of pharmacists in the evolving use of CBD and cannabis, exposing significant knowledge gaps that impact patient care. As trusted professionals, pharmacists are essential in ensuring the safe and informed use of these products, but many lack the education and resources needed to meet this demand. Particularly concerning is the limited understanding of CBD's legal status and classification. Furthermore, knowledge of clinical safety issues was notably poor. A substantial proportion of pharmacists also reported feeling unprepared to recommend CBD, citing both limited training and inadequate access to reliable resources in their workplace.

Some strategies that may address this include integrating cannabis-related content into pharmacy curricula, offering CPD-accredited training focused on CBD legislation and safety, developing practical reference tools such as mobile apps or clinical databases, and fostering interprofessional workshops.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

Y.N. and N.E. conceptualised the article, and Y.N. wrote the original draft. N.E. reviewed the drafts and provided feedback.

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Data availability

The data that support the findings of this study are not openly available because of agreements with respect to confidentiality between the authors, participants and institutional criteria but may be available from the corresponding author, N.E., upon reasonable request.

Disclaimer

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