ORIGINAL ARTICLE

NSW Cannabis Medicines Advisory Service preliminary survey results: enquirer perceptions and patient outcomes

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Abstract

Background: In 2018, an innovative, State government-funded cannabis medicines drug information service was established for health professionals in New South Wales (NSW). The NSW Cannabis Medicines Advisory Service (CMAS) provides expert clinical guidance and support to medical practitioners considering prescribing a cannabis medicine to their patient(s).

Aims: This research examines quality assurance and patient outcomes related to enquirers' experience with NSW CMAS.

Methods: Data collection involved an online, anonymous survey with two components. Following a health professional enquiry, quality assurance data were collected about the enquirers' experience with NSW CMAS. The second survey focussed on patient outcomes and provides real-world observational data about cannabis medicines safety and effectiveness across a wide range of indications.

Results: Data collection occurred between January 2020 and June 2021. Preliminary analyses were based on 68 quality assurance and 50 patient outcomes survey responses. General practitioners represented the highest proportion of survey responses ($n = 33$; 49%). The most common enquiry involved 'patient-specific advice' ($n = 50$; 74%). Patient-specific information provided by the service was mainly used for prescribing decision support ($n = 45$; 90%).

Conclusions: Preliminary findings highlight the impact of an innovative cannabis medicines drug information service in supporting health professional clinical practice in an area of rapid knowledge translation. Quality assurance data indicate that the service is perceived well by the majority of enquirers. Patient outcomes data across a wide range of indications suggest some effectiveness and a reasonable safety profile for prescribed cannabis medicines for most patients.

Introduction

The shift of cannabis medicines from research into clinical practice settings has occurred at a rapid speed. Despite a sig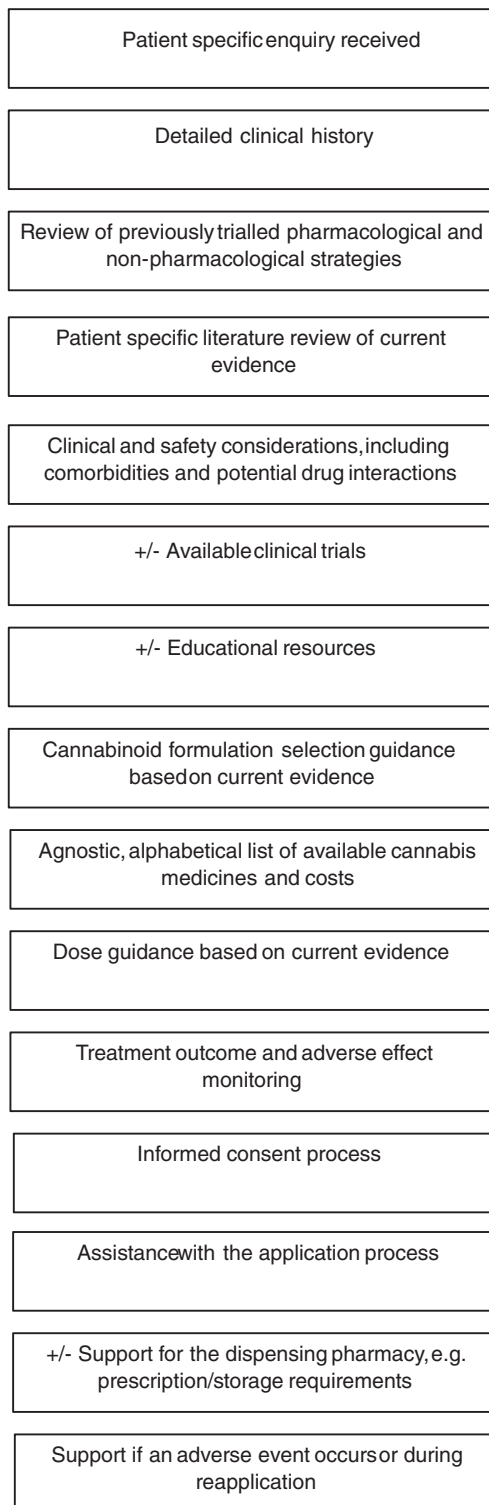nificant increase in the published literature on cannabis medicine in recent years, there are still significant gaps in research, including but not limited to effectiveness, safety, drug interactions, product selection and dose. New South Wales Cannabis Medicines Advisory Service (NSW CMAS) was the first innovative cannabis medicines drug information service in Australia. It was established in 2018 by NSW Health and funded by the NSW Government. NSW CMAS provided free, evidence-based clinical advice and guidance about cannabis medicines to NSW registered health practitioners. The service facilitated rapid knowledge translation based on recent research findings to support clinical practice. An overview of NSW CMAS services available to prescribers in the context of a patient specific enquiry is outlined in Figure 1.

In conjunction with survey outcomes, we hope in the future to be able to analyse a comprehensive retrospective database of over 2850 service enquiries.

In Australia, there are two cannabis medicines registered on the Australian Register of Therapeutic Goods, Sativex and Epidyolex. The majority of cannabis medicines available are unregistered and need to comply with the Therapeutic Goods (Standard for Medicinal Cannabis) (TGO 93) Order (cannabinoid content and quality specifications). There are greater than 250 unregistered cannabis medicine products. These differ in cannabinoid composition and dose form (Table 1). Oral oils are the predominant dosage form of unregistered cannabis medicines approved through the Special Access Scheme (SAS) in Australia.[1]

Quality assurance (QA) is an important part of any drug information service and this process provides the necessary information for continual quality improvement of a service. When the service was established, QA surveys were a NSW Health requirement.

Figure 1 Legend on next coloumn.

Figure 1 NSW CMAS services available to prescribers. Service methodology is focussed on supporting clinicians with the latest evidence related to cannabis medicines and patient safety considerations. On receipt of an enquiry and eliciting a detailed clinical history, NSW CMAS conducts patient-specific literature reviews in order to provide a response tailored to the individual clinical context. This process also involves review of previously trialled therapies. An analysis of patient specific clinical and safety considerations is provided. Enquirers may also request information about clinical trials a patient may be eligible for and educational resources. In the absence of contraindications, the service provides guidance on cannabinoid formulation selection, agnostic product availability and cost lists and dose guidance based on the latest evidence. Additional components of an enquiry response include guidance regarding treatment outcome and adverse event monitoring, informed consent and safety considerations. Support is also provided during the application or reapplication process, pharmacy dispensing and if an adverse event occurs. NSW CMAS, New South Wales Cannabis Medicines Advisory Service.

Table 1 Registered and unregistered cannabis medicine composition and dose form examples

Registration status	Cannabinoid composition	Dose form
Registered cannabis medicines	Sativex ((nabiximols) delta-9 tetrahydrocannabinol (THC), cannabidiol (CBD) and other cannabinoids)	Oromucosal spray
	Epidyolex (cannabidiol)	Oral liquid
Unregistered cannabis medicines	CBD only or predominant, THC only or predominant, ~1:1 THC and CBD, other cannabinoids and ratios	• Oral oils, sprays, solutions and tinctures • Capsules and chewable tablets • Lozenges • Oral sublingual wafers • Oromucosal/buccal sprays • Flos/granulate for vaporisation • Topical: topical balm, transdermal patch, lotion, cream • Crystals

A variety of resources were used to inform the development of the QA component of the survey, including Net Promoter Score model,[2,3] United Kingdom Medicines information survey,[4,5] Minnesota Medical Cannabis Program health professional survey,[6] a survey of pain medicine specialists in Israel[7] and a survey that accompanies insurance-covered prescriptions of cannabis-based medicines in Germany.[8,9] Internationally, real-world evidence (RWE) data collection has occurred to complement randomised controlled trials (RCT) investigating the use of cannabis medicines, including but not limited to the use of survey tools.[10]

Aims

The aims of this research project were to analyse enquirer experience with NSW CMAS and real-world cannabis medicine safety and effectiveness data in a variety of clinical indications.

Methodology

The data collection involved a two-part voluntary, anonymous, cross-sectional, online survey, encompassing the following:

• Survey 1 (QA): evaluation of health practitioner (enquirer) experience of NSW CMAS.
• Survey 2 (patient outcomes; asked only of medical practitioners reporting a patient-specific nature of enquiry): collection of cannabis medicine safety and effectiveness data across multiple clinical indications.

The survey tool was developed in consultation with cannabis medicine experts and researchers. The survey was tested by 12 subjects (including senior pharmacists, clinical pharmacologists, cannabis medicine, health service and policy researchers and senior policy officers) to gather feedback, establish the time required to complete the survey and refine the survey design and content. The QA component (Survey 1) consisted of nine questions and the patient outcomes component (Survey 2) consisted of five core questions and could be completed for multiple patients. Algorithms were incorporated into the survey design to reveal 16 further questions, depending on options selected. Survey 1 took approximately 5 min and Survey 2 approximately 5–10 min to complete (see the Appendix for a descriptive outline of both survey components).

Study participants (and inclusion criteria) were NSW-registered health professionals, including medical practitioners, nurses and pharmacists who had made an enquiry to NSW CMAS. Exclusion criteria included enquiries from non-health professionals or stakeholders, enquiries with one or more components requiring direct referral to another entity, enquiries from other Australian states and territories and international enquiries. The survey data were collected using the secure Research Electronic Data Capture (REDCap) platform.[11] Hunter New England Local Health District Ethics Committee approval was obtained (2019/ETH12588).

Eligible participants were approached by NSW CMAS through email with a survey link approximately 1 week after the enquiry response, inviting them to participate in the survey. A Participant Information Statement detailing the informed consent process was provided. Participants were given a 6-week time frame to complete the survey and a reminder email was sent after approximately 5 weeks. The 6-week time frame was selected to be the most appropriate as it allowed time for one or more follow-up patient visits with the medical practitioner.

Statistical analysis

Data analyses were performed using SAS Version 9.4 software and included descriptive statistical techniques. Both survey tools were examined in terms of missing or invalid data, appropriate and adequate response options

and correct filtering of questions. A qualitative thematic analysis of free text responses was undertaken.

Results

Preliminary results of the NSW CMAS survey included data collected between January 2020 and June 2021. It was intended that the preliminary results would be used to inform any modifications required for the survey. For example, more response options for survey questions with a high frequency of 'Other' responses.

Eligibility and survey response rates

Of the 1029 enquiries to the service between January 2020 and June 2021, using the criteria listed above,
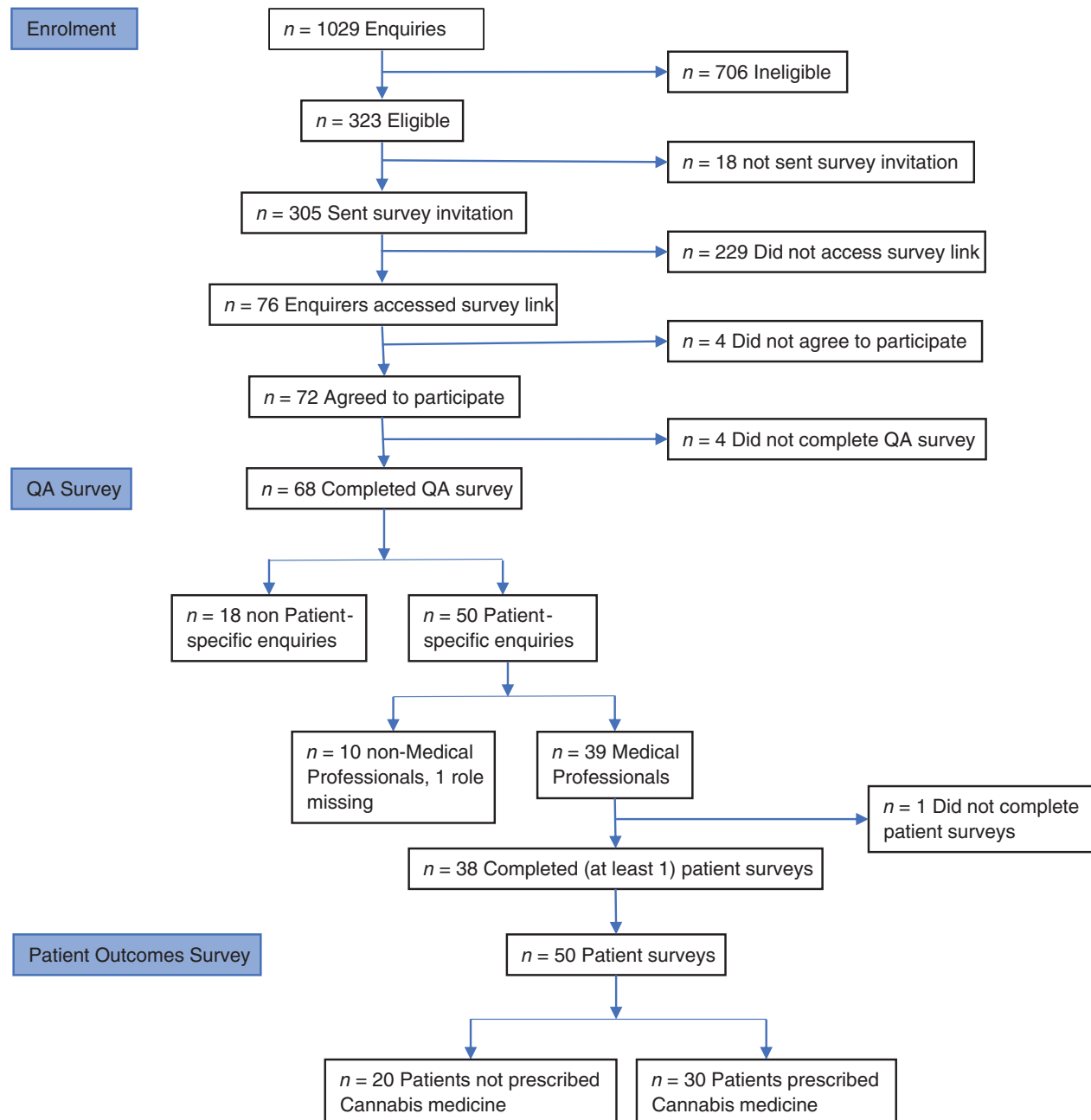

Figure 2 Survey participation results.

323/1029 (31%) were deemed eligible to participate in this research. Survey links were sent to 305/323 (94%) of these enquirers, and 86% of enquiries were sent a 5-week reminder email. Of those that were not sent 5-week reminder email, the majority were delayed due to sequential enquiries within the same time period. Due to the anonymous nature of the survey (as required by ethics), it was not possible to match up survey responses to enquirers, or direct reminders to enquirers who had not completed the survey. The survey link was accessed by 76 (*n* = 76/305; 25%) respondents, and 95% (*n* = 72/76) agreed to participate. A total of 68/305 QA surveys were started and have been included in the analyses, giving a response rate of 22% for this study (Fig. 2).

Survey 1 (QA)

Service demographics and enquiry types

Survey respondents were mainly general practitioners (*n* = 33/67; 49%), medical specialists (*n* = 12/67; 18%), pharmacists (*n* = 14/67; 21%) and nurses (*n* = 6/67; 9%; Table 2). The most common enquiries included 'patient-specific advice' (*n* = 50/68; 74%), 'cannabis medicine prescribing advice' (*n* = 29/68; 43%) and 'evidence-based literature review' (*n* = 21/68; 31%). A high proportion of respondents (*n* = 41/68; 60%) selected more than one enquiry type.

The most frequently selected terms used to describe NSW CMAS included 'useful' (*n* = 56/68; 82%), 'comprehensive' (*n* = 52/68; 76%), 'practical' (*n* = 40/68; 59%) and 'evidence-based' (*n* = 40/68; 59%). The service was described as 'helpful' in two of the three free text descriptors. All but one respondent reported receiving a response to their enquiry by the requested time (*n* = 67/68; 99%). Respondents indicated that 'literature review of current evidence' (*n* = 32/68; 47%), assistance with the application process (*n* = 8/68; 12%) and 'product advice' (*n* = 8/68; 12%) were the most useful aspects of NSW CMAS (Table 2).

The survey included three questions regarding perceptions of the service. On a scale of 0 (not at all likely/satisfied) to 10 (extremely likely/satisfied), the majority of responses for all three questions was 8–10 (98% likely to recommend, 94% satisfaction and 94% likely to contact CMAS again) indicating a high level of satisfaction with the service.

The survey also included a free-text question to obtain suggestions for how the value of the NSW CMAS could be enhanced. The majority of survey respondents used this section to provide complimentary statements (rather than suggestions) about the service. Thematic analyses suggested that respondents perceived the service as 'excellent', 'comprehensive', 'helpful', 'great' and 'fantastic'. In contrast to the predominant positive responses, a minority (*n* = 2) of respondents were dissatisfied.

Survey 2 (patient outcomes)

The majority (*n* = 38/39; 97%) of medical professionals whose enquiry was patient specific completed at least one

Table 2 Responses to QA survey questions

Characteristic	(Total *n* = 68)‡
Health practitioner type	
GP	33 (49.3%)
Medical specialist	12 (17.9%)
Pharmacist	14 (20.9%)
Nurse	6 (9.0%)
Other health professional	2 (3.0%)
Missing	1
Nature of enquiry to NSW CMAS†	
Patient specific	50 (73.5%)
Dose and titration guidance	11 (16.2%)
Evidence-based literature review	21 (30.9%)
Cannabis medicine prescribing advice	29 (42.6%)
Cannabis medicines supplier information	15 (22.1%)
Cannabis medicines product information	15 (22.1%)
Application process support	17 (25.0%)
Other regulatory information	14 (20.6%)
Other general information	4 (5.9%)
More than one enquiry type	
Single enquiry type selected	27 (39.7%)
Multiple enquiry types selected	41 (60.3%)
Words used to describe NSW CMAS†	
Practical	40 (58.8%)
Useful	56 (82.4%)
Comprehensive	52 (76.5%)
Accurate	32 (47.1%)
Evidence based	40 (58.8%)
Not useful	1 (1.5%)
Other	3 (4.4%)
Response by NSW CMAS received by the agreed time	
No	1 (1.5%)
Yes	67 (98.5%)
Aspect of NSW CMAS most useful	
Literature review of current evidence	32 (47.1%)
Assistance with the Special Access Scheme application process	8 (11.8%)
Dosing advice	1 (1.5%)
Product advice	8 (11.8%)
Cannabis medicine educational resources	3 (4.4%)
Other	16 (23.5%)

†This survey question allowed multiple responses. Percentage calculations are based on the number of respondents rather than responses.
‡ Missing responses have been excluded from percentage calculations.
GP, general practitioner; NSW CMAS, New South Wales Cannabis Medicines Advisory Service; QA, quality assurance.

Table 3 Prescribing information and patient outcomes, in patients prescribed a cannabis medicine

Survey question	Response	Total ($n = 30$)‡
Indication†	Chronic non-cancer pain	21 (70.0%)
	Insomnia	4 (13.3%)
	Palliative care	4 (13.3%)
	Other: anorexia and/or cachexia; nausea and/or vomiting; spasticity in multiple sclerosis	2 (6.7%)
	Other: mental health (anxiety; post-traumatic stress disorder)	3 (10.0%)
	Other: seizures and/or refractory epilepsy	2 (6.7%)
Cannabinoid composition of cannabis medicine trialled	THC and CBD 1:1 combination	19 (63.3%)
	CBD predominant product	10 (33.3%)
	THC predominant product	1 (3.3%)
Duration of cannabis medicine trial	1 month or more	21 (70.0%)
	1 week or more (less than a month)	3 (10.0%)
	Other: not yet initiated, recently commenced or ongoing use planned	6 (20.0%)
Patient reported that the cannabis medicine was effective	Yes	24 (82.8%)
	Unsure	5 (17.2%)
	Missing	1
Patient reported effectiveness type† ($n = 24$)	Symptom reduction	24 (100.0%)
	Reduced medication load	10 (41.7%)
	Improved quality of life	21 (87.5%)
	Other (improved diet/nutrition, yet to be determined)	2 (8.3%)
Reported effectiveness based on medical practitioner clinical assessment	Moderately effective	9 (36.0%)
	Very effective	11 (44.0%)
	Extremely effective	5 (20.0%)
	Missing	5
Reported effectiveness type based on medical practitioner clinical assessment† ($n = 25$)	Symptom reduction	23 (92.0%)
	Reduced medication load	13 (52.0%)
	Improved quality of life	22 (88.0%)
	Other (improved sleep and mood, improved nutrition)	2 (8.0%)
Palliative care: improvement in patient's quality of life ($n = 4$)	Yes	4 (100.0%)
Palliative care: improvement in patient's activities of daily living ($n = 4$)	No	1 (25.0%)
	Yes	3 (75.0%)
Adverse events	No	23 (85.2%)
	Yes	1 (3.7%)
	Unsure	3 (11.1%)
	Missing	3

†This survey question allowed multiple responses.
‡Missing responses have been excluded from percentage calculations. CBD, cannabidiol; THC, delta-9-tetrahydrocannabinol.

patient outcomes survey, with 87% ($n = 33/38$) only completing a survey for one patient. A total of 50 patient outcome surveys were started by medical practitioners and included in the analyses. Responses mainly pertained to patients aged 41–65 years ($n = 20/50$; 40%) and 65+ years ($n = 15/50$; 30%). There was a similar representation of female ($n = 26/50$; 52%) and male patients ($n = 24/50$; 48%).

Patient-specific information was predominantly used for prescribing decision support ($n = 45/50$; 90%). In 60% ($n = 30/50$) of patients, it was indicated that a cannabis medicine was prescribed and a high proportion of

patient survey responses ($n = 34/50$; 68%) indicated that the enquiry response from NSW CMAS influenced the decision to prescribe.

In those patients prescribed cannabis medicines, there were a broad range of indications (Table 3). Chronic non-cancer pain was the most frequent indication for cannabis medicine ($n = 21/30$; 70%), followed by insomnia ($n = 4/30$; 13%). Palliative care was the indication for cannabis medicine prescription for four of 30 (13%) patients. An improvement in quality of life (QoL) was indicated for all four of these patients and improvements in activities of daily living were reported for three of the four.

The majority of patients trialled the cannabis medicine for 1 month or more ($n = 21/30$; 70%). Delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) 1:1 combinations were most frequently prescribed ($n = 19/30$; 63%), followed by CBD predominant ($n = 10/30$; 33%) and THC predominant ($n = 1/30$; 3%) products. In patients prescribed a cannabis medicine for chronic non-cancer pain, 67% ($n = 14/21$) were prescribed a THC and CBD 1:1 combination product, 29% ($n = 6/21$) a CBD predominant product and 5% ($n = 1/21$) a THC predominant product; low numbers prohibited further examination of cannabinoid composition within other indications. Where multiple indications were recorded, we have assumed that the formulation specified in the survey response was the same for all indications.

In relation to patient reported outcomes, 24 of 29 (83%) patients reported to their medical practitioner that the cannabis medicine was effective for the indication(s) for which it was prescribed. The most common effectiveness reported was 'symptom reduction' ($n = 24/24$; 100%), followed by 'improved quality of life' ($n = 21/24$; 88%) and 'reduction of medication load' ($n = 10/24$; 42%). Based on clinical assessment, respondents were asked how effective they (the medical practitioner) thought the medication was and all respondents who answered this question ($n = 25$) indicated some degree of effectiveness: 'moderately effective' ($n = 9/25$; 36%), 'very effective' ($n = 11/25$; 44%) and 'extremely effective' ($n = 5/25$; 20%). Based on clinical assessment, 'symptom reduction' ($n = 23/25$; 92%) and 'improved quality of life' ($n = 22/25$; 88%) was most commonly reported.

No adverse events were reported for the majority of patients ($n = 23/27$; 85%). A renal adverse event was reported by one respondent. Additionally, three respondents were unsure whether the patient had experienced any adverse events and three respondents did not answer this question. Only 55% ($n = 27/49$; 1 missing) of respondents indicated that they were aware of the requirement to report adverse events to unregistered cannabis medicines to the Therapeutic Goods Administration within a specified time period.

Discussion

The preliminary survey analyses provide a unique snapshot of enquirer perceptions and the impact of a novel cannabis medicines drug information service. From a QA perspective, results of the analyses suggested that most respondents perceived the service as useful, comprehensive, practical and evidence-based. As stated by Hein *et al.*,[12] provision of drug information about cannabis medicines is heavily reliant on primary literature resources, particularly due to the rapid publication of cannabis medicines related literature. This is reflected in survey results, with literature review of current evidence perceived as most useful. The majority of survey respondents indicated that they received the response by the agreed time, were likely to contact NSW CMAS again, recommend the service to a colleague (this was reinforced by free-text comments) and were satisfied with the quality of advice received.

Consistent with national data on unregistered cannabis medicine SAS approval trends,[1] chronic non-cancer pain (70%) was the most prevalent indication for cannabis medicine prescription. Insomnia (13%) was the second most common indication. For all indications, 83% of medical practitioners indicated that the patient reported to them that cannabis medicines were effective, particularly in terms of symptom reduction (100%), QoL (88%) and reduced medication load (42%). While Gulbransen *et al.*[13] reported results from initial patients prescribed CBD in Aotearoa, New Zealand, the patients reported here were predominantly (63%) prescribed a THC and CBD 1:1 combination. Medical practitioners described that the cannabis medicine was 'very' or 'extremely' effective for the prescribed indication (64%) based on their clinical assessment. Based on medical practitioner clinical assessment of effectiveness, symptom reduction (92%) and improvements in QoL (88%) were noted for most patients.

A previously published health professional survey highlighted a disparity between health professional and patient perceptions of cannabis medicine effectiveness.[14] RCT are warranted to provide much needed data about the safety and efficacy of cannabis medicines and to clarify health professional and patient perceptions of effectiveness. Although as other authors[15] have noted, there will be a time delay before RCT research results are available with cannabis medicines, and RWE research outcomes are an important source of information in the interim. RWE can be collected from a variety of sources, including clinical trials and observational data. International RWE frameworks[16,17] could be adapted to a

cannabis medicines specific RWE research framework that establishes clear methodological guidelines and cohesive mechanisms of real-world data (RWD) collection.

Preliminary survey results suggested a reasonable safety and tolerability profile of cannabis medicines. The national adverse events data collection repository, the Database of Adverse Event Notifications does not include adverse events related to unregistered cannabis medicines.[18] Approximately half of all respondents indicated that they were aware of adverse event reporting requirements for unregistered cannabis medicines. Shakeri *et al.*[19] highlights the need for regulatory support in the collection and sharing of RWE data related to cannabis medicines. Facilitating public visibility of these data at a national level is one possible solution to promote reporting of adverse events with unregistered cannabis medicines.

One of the challenges faced in survey distribution was as a result of the comprehensive support provided, often involving multiple enquiries related to the same patient. Survey distribution patterns were adapted in the event of ongoing enquiry episodes; initial emails for multiple enquiries within one week were sent following the last enquiry received, and 5-week reminder emails were sent after the last related enquiry.

A limitation of the cross-sectional survey design is that it provided a snapshot at one time point. The cross-sectional design was necessary as the survey has a dual purpose of collecting Survey 1 (QA) and Survey 2 (patient outcomes) data. The generalisability of the results is limited by the specific population studied and characteristics of respondents. Comparative analyses of preliminary results are limited by the sample size; however, with more time there will be an accumulation of experience, allowing the analysis of a larger sample. It is not possible to exclude the possibility of bias (such as selection bias and response bias) as patients prescribed cannabis medicines are likely to be refractory to standard first line treatment options. The anonymous survey design does not preclude respondents completing the survey more than once. Therefore, the results of the preliminary survey analyses should be viewed with these limitations in mind.

Conclusion

The collaborative effort of researchers around the world has and is continuing to progress knowledge about cannabis medicines and we encourage the removal of barriers to undertake this research.[20] It is important that both RWE and RCT research is facilitated and funded to improve knowledge in this field. The preliminary NSW CMAS survey results highlight how an innovative drug information service can provide helpful clinical guidance in the translation of an emerging field of research into clinical settings. In addition to providing service QA, the patient outcomes component provides RWD about cannabis medicine safety and effectiveness that can be used to inform further research in this field.

Acknowledgements

References

1 Therapeutic Goods Administration (homepage on the internet). Medicinal cannabis Special Access Scheme Category B data. TGA SAS dashboard [updated 2021 Aug; cited 2021 Sep 29]. Available from URL: https://www.tga.gov.au/medicinal-cannabis-special-access-scheme-category-b-data

2 Koladycz R, Fernandez G, Gray K, Marriott H. The Net Promoter Score (NPS) for insight into client experiences in sexual and reproductive health clinics. *Glob Health Sci Pract* 2018; **6**: 413–24.

3 Krol MW, de Boer D, Delnoij DM, Rademakers JJ. The Net Promoter Score—an asset to patient experience surveys? *Health Expect* 2015; **18**: 3099–109.

4 McEntee JE, Henderson SL, Rutter PM, Rutter J, Davis HJ, Randall CJ. A survey of UK dental health professionals using a medicines information service: what questions do they ask and do they get useful answers? *Br Dent J* 2011; **211**: 17–21.

5 Kearney L. UKMi user satisfaction survey. 2019 [cited 2021 Jan 14]. Available from URL: https://www.sps.nhs.uk/articles/ukmi-user-satisfaction-survey/

6 McGriff D, Anderson S, Arneson T. Early survey results from the Minnesota Medical Cannabis Program. *Minn Med* 2016; **99**: 18–22.

7 Sharon H, Goldway N, Goor-Aryeh I, Eisenberg E, Brill S. Personal experience and attitudes of pain medicine specialists in Israel regarding the medical use of cannabis for chronic pain. *J Pain Res* 2018; **11**: 1411–9.

8 Schmidt-Wolf G, Cremer-Schaeffer P. Interim analysis of the survey accompanying insurance covered prescriptions of cannabis-based medicines in Germany. *Bundesgesundheitsblatt*

Gesundheitsforschung Gesundheitsschutz 2019; **62**: 845–54.

9 Cremer-Schaeffer P, Schmidt-Wolf G, Broich K. Cannabis medicines in pain management: interim analysis of the survey accompanying the prescription of cannabis-based medicines in Germany with regard to pain as primarily treated symptom. *Schmerz* 2019; **33**: 415–23.

10 Graham M, Lucas CJ, Schneider J, Martin JH, Hall W. Translational hurdles with cannabis medicines. *Pharmacoepidemiol Drug Saf* 2020; **29**: 1325–30.

11 Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)— a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009; **42**: 377–81.

12 Hein D, Cochrane ZR, Castillo S, Webster B. Characterization of cannabis-related consultations in an academic drug information service. *J Am Coll Clin Pharm* 2020; **3**: 182 (conference abstract).

13 Gulbransen G, Xu W, Arroll B. Cannabidiol prescription in clinical practice: an audit on the first 400 patients in New Zealand. *BJGP Open* 2020; **4**: bjgpopen20X101010.

14 Minnesota Department of Health – Office of Medical Cannabis. Minnesota Medical Cannabis Program: Patient Experiences from the First Program Year. [cited 2021 Jan 14]. Available from URL: https://idph.iowa.gov/ Portals/1/userfiles/234/Files/First% 20Year%20Report.pdf

15 Schlag AK. An evaluation of regulatory regimes of medical cannabis: what can be learned for the UK? *Med Cannabis Cannabinoids* 2020; **3**: 76–83.

16 U.S. Food & Drug Administration. Framework for FDA's real-world evidence program. 2018 [updated 2018 Dec; cited 2021 Jul 19]. Available from URL: https://www.fda.gov/media/ 120060/download

17 Canadian Agency for Drugs and Technologies in Health (CADTH). Use of Real-World Evidence in Single-Drug Assessments Environmental Scan. 2020 [updated 2020 May 26; cited 2021 Jul 19]. Available from URL: https://www. cadth.ca/use-real-world-evidence- single-drug-assessments- environmental-scan

18 Martin JH, Lucas CJ. Reporting adverse drug events to the Therapeutic Goods Administration. *Aust Prescr* 2021; **44**: 2–3.

19 Shakeri A, Zhang M, Tadrous M. The missed opportunity for real-world evidence to shape our understanding of medicinal cannabis. *Br J Clin Pharmacol* 2020; **87**: 732–4.

20 Martin JH, Hill C, Walsh A, Efron D, Taylor K, Kennedy M *et al.* Clinical trials with cannabis medicines-guidance for ethics committees, governance officers and researchers to streamline ethics applications and ensuring patient safety: considerations from the Australian experience. *Trials* 2020; **21**: 932.

Appendix A.

Survey question content and structure

Quality assurance (part 1 survey component)

The QA survey component collected demographic data about health professional type. Multiple choice options (including a free text option) were used to collect data about the nature of the enquiry, terminology that the enquirer would use to describe the service and what aspect of the service was most useful. A dichotomous (yes/no) question was included to determine whether the response was received by the agreed time. Likert scales (0 – not at all likely/ satisfied; 10 – extremely likely/satisfied) were used to determine how likely the enquirer is to re-contact the service, whether they would recommend the service to a colleague and satisfaction with the quality of the advice. A free text option was included to facilitate suggestions for how the value of the service could be enhanced.

Patient outcomes (part 2 survey component)

The patient outcome survey collected demographic data. Multiple choice options (including a free text option) were incorporated to determine how the enquirer used patient-specific information provided by the service. Dichotomous (yes/no) questions were used to gather information about whether the medical practitioner elected to prescribe a cannabis medicine and whether the NSW CMAS enquiry response influenced their decision to prescribe. It is important to note that NSW CMAS provides advice to health professional enquirers who would like to prescribe, are considering the prescription of or have elected not to prescribe a cannabis medicine. In the instance that an enquirer to the service elected to prescribe a cannabis medicine, further multiple choice (including free text option) questions gather information about the indication, which product was trialled (delta-9-tetrahydrocannabinol (THC) and cannabidiol ~1:1 combination product, THC predominant, cannabidiol predominant and a free text option), dose range (specific to the cannabinoid selected) and trial duration. If a palliative indication was selected, dichotomous (yes/no) questions were used to assess whether the medical practitioner observed an improvement in the patient's quality of life and activities of daily living. Patient outcome data collection involved questions about whether the patient reported the cannabis medicine was effective for the indication prescribed (yes/no/unsure) and descriptors of effectiveness measures. Additionally, medical practitioners were asked to provide their own clinical assessment of effectiveness (not at all effective to

extremely effective) and to select measures of effectiveness. Medical practitioners were requested to indicate whether the patient had experienced any adverse events (yes/no/unsure), type and outcome of the adverse event and this section included a question about awareness of reporting requirements for unregistered cannabis medicines to the Therapeutic Goods Administration.