



## Prevalence and correlates of cannabis use for medicinal reasons – An Australian cross-sectional study

Janni Leung<sup>a,b,\*</sup>, Carmen C.W. Lim<sup>a,b</sup>, Vivian Chiu<sup>a,b</sup>, Jack Chung<sup>a,b</sup>, Tesfa Mekonen<sup>a,b</sup>, Danielle Dawson<sup>a,b</sup>, Wayne D. Hall<sup>a,c</sup>, Gary C.K. Chan<sup>a</sup>

<sup>a</sup> National Centre for Youth Substance Use Research, The University of Queensland, Australia

<sup>b</sup> School of Psychology, The University of Queensland, Australia

<sup>c</sup> Queensland Alliance for Environmental Health Sciences, The University of Queensland, Australia

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### ABSTRACT

**Objective:** It is important to know the prevalence and source of medicinal cannabis use in the population because non-prescribed medicinal use of cannabis products places individuals at higher risk of harms. We estimated the prevalence and correlates of the use of cannabis for medicinal purposes in Australia, three years after Australians were given legal access.

**Design:** Cross-sectional.

**Setting:** The 2019 Australian National Drug Strategy Household Survey.

**Participants:** Participants were 22,015 Australians aged 14 or above.

**Outcome measure:** Self-reported cannabis use in the last 12 months for medicinal purposes only, both medicinal/recreational reasons, or recreationally only. Those who reported medicinal use were asked if it had been prescribed by a doctor. Prevalence estimates were weighted to the population and multinomial logistic regression examined the correlates.

**Results:** The prevalence of any medicinal cannabis use in the past year was 2.6%. Only 0.8% of the sample reported using cannabis solely for medicinal reasons, 95.9% of whom did not have a prescription. A self-reported diagnosis of cancer was associated with medicinal use only. Self-reported chronic pain was associated with both medicinal only and medicinal/recreational use. Medicinal cannabis use was associated with opioids use.

**Conclusions:** In 2019, the prevalence of cannabis use solely for medicinal reasons remains under 1%, was more common among people with specific medical conditions, but most individuals do not have a prescription. The prevalence of self-reported medicinal cannabis use in Australia is low and there is limited use of the legal pathway for medicinal cannabis.

### 1. Introduction

An increasing number of jurisdictions around the world have legalized patient access to cannabis for medicinal purposes (Hall et al., 2019). This trend began with the legalization of medical cannabis use by popular ballot in California in 1996, and a court decision in Canada in 2000, saying that laws denying patients access to cannabis for medical use violated their human rights.

Australia legislated to allow the medicinal use of cannabis in November 2016 under the Special Access Schemes (SAS) of the Therapeutic Goods Administration (TGA). This scheme allows medical

practitioners to prescribe medical cannabis products as unapproved therapeutic products for a variety of conditions that include chronic pain, anxiety, cancer-related symptoms, epilepsy, and other neurological disorders (Arnold et al., 2020). Medical practitioners can also prescribe medical cannabis to children under 16 years of age by obtaining special approval.

A previous community survey was conducted in 2016 immediately after the approval of prescribed medicinal cannabis (Lintzeris et al., 2018). They found that the majority of the 1,629 respondents, who self-identified as individuals who used medicinal cannabis, reported getting their cannabis from recreational cannabis dealers or other unauthorised

\* Corresponding author at: The University of Queensland, NCYSUR, 17 Upland Road, St Lucia, QLD 4072, Australia.

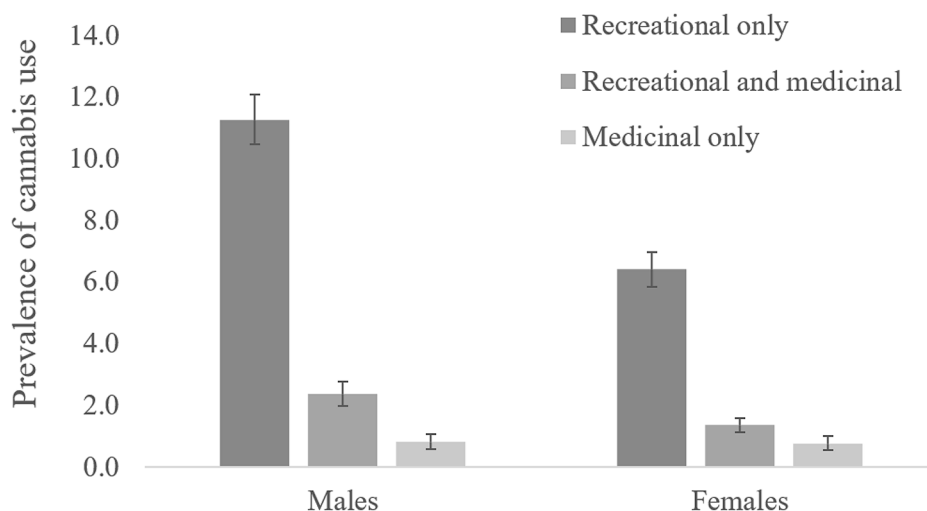
E-mail addresses: [j.leung1@uq.edu.au](mailto:j.leung1@uq.edu.au) (J. Leung), [c.lim@uq.edu.au](mailto:c.lim@uq.edu.au) (C.C.W. Lim), [vivian.chiu@uq.net.au](mailto:vivian.chiu@uq.net.au) (V. Chiu), [yiuchak.chung@uq.edu.au](mailto:yiuchak.chung@uq.edu.au) (J. Chung), [t.yimer@uq.net.au](mailto:t.yimer@uq.net.au) (T. Mekonen), [danielle.dawson@uq.net.au](mailto:danielle.dawson@uq.net.au) (D. Dawson), [w.hall@uq.edu.au](mailto:w.hall@uq.edu.au) (W.D. Hall), [c.chan4@uq.edu.au](mailto:c.chan4@uq.edu.au) (G.C.K. Chan).

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**Fig. 1.** Prevalence of past year cannabis use in Australia in 2019: self-reported use for recreational only, any medicinal use, and only medicinal use (N = 22,015; data available in Appendix Table S1).

sources (Lintzeris et al., 2018). Only one person obtained cannabis on a prescription (Lintzeris et al., 2018). A follow-up survey conducted 2 years later found that 2% accessed legally prescribed medical cannabis (Lintzeris et al., 2020).

To our knowledge, there has been no existing studies on the population prevalence of cannabis use specifically for medicinal reasons in Australia. In the 2018 International Cannabis Policy Study (ICPS) conducted across Canada and the USA, the prevalence of self-reported ever cannabis use for medical purposes was 27%, with similar rates by sex and the highest prevalence in young adults (Leung et al., 2022). A study of US medical cannabis registry data between 2013 and 2020 found that program enrollment increased in states without recreational laws (Okey et al., 2022).

Most existing literature on the correlates of cannabis use have been on non-medical cannabis. Systematic reviews have shown that non-medical cannabis use is associated with being males, young age, not being married or having a partner, lower education or socio-economic status, school drop-out and unemployment (Hall et al., 2020). There has been mixed evidence regarding the association between non-medical cannabis use with mental health and other substance use, such as alcohol and opioids (Hall et al., 2020).

There is a dearth of studies on the epidemiology and associates of medicinal cannabis use. Existing online surveys recruited non-random snowball samples of people who self-identified as individuals who used medical cannabis (Lintzeris et al., 2020). It is unclear if their findings on reasons for use, individual characteristics, and their sources of cannabis are representative in the general population.

It is important to know the prevalence and source of medicinal cannabis use in the population because non-prescribed medicinal use of cannabis products places individuals at higher risk of harms. This study presents national data on the prevalence and correlates of cannabis use for medicinal purposes in the Australian population in 2019, three years after the approval of legal access to medical cannabis. Cannabis for recreational use was not legalised in any of the Australian jurisdictions at that time.

## 2. Methods

### 2.1. Design

We used data from 22,015 participants of the 2019 Australian National Drug Strategy Household Survey (NDSHS), a national survey that used stratified multistage random sampling (Australian Institute of Health and Welfare, 2020). Individuals aged 14 or above were eligible.

Ethics exemption for this secondary analysis study was approved from University of Queensland (Human Research Ethics Committees).

### 2.2. Medicinal cannabis use status

Participants self-reported on whether they have used marijuana/cannabis in the last 12 months, then if yes, if they have used it for medical purposes, which responses were: yes, only for medical purposes (medicinal only); yes, but sometimes for medical purposes and sometimes for other reasons (recreational and medicinal); or no, have not used it for medical purposes (recreational only). Those who reported use for medical purposes were asked if the cannabis was prescribed by a doctor.

### 2.3. Individual characteristics

We examined the following correlates of medicinal cannabis use: sex, age-group, marital status, household/personal income, remoteness of residence, education, country of birth, employment, and past month psychological distress (Kessler Psychological Distress Scale). Age groups were categorised as 14–17, 18–29, 30–49, and 50+, due to small cell size by more detailed age groups. Cancer and chronic pain were self-reported diagnoses or treatment in the past 12 months. Other substance use in the past 12 months included alcohol, meth/amphetamine, cocaine, extra-medical opioids, and hallucinogens. These variables were selected because they have been shown to be associated with cannabis use in previous studies and are available in the survey.

### 2.4. Analysis

We estimated the prevalence of cannabis use by recreational/medicinal use status (recreational only, recreational and medicinal, or medicinal only). Multinomial logistic regression examined the odds ratios (95% CI) of the medicinal cannabis use only and both medicinal and recreational use (compared to recreational use only) by respondent characteristics. All variables were entered into one regression model simultaneously. All analyses were weighted to account for the differential probability of selection within households and were conducted in STATA version 17.0. Significance were evaluated at the 0.05 level.

**Table 1**  
Multiple regression on cannabis use for medicinal reasons among Australians who used cannabis in the past 12 months in 2019 (N = 2,273).

	Odds ratios of past 12 months medicinal cannabis use among people who used cannabis (Ref: recreational use only)			
	Medicinal cannabis use only OR (95% CI)	p	Both medicinal and recreational OR (95% CI)	p
<b>Gender (ref: females)</b>				
Males	0.79 [0.49–1.27]	0.335	1.08 [0.80–1.47]	0.606
<b>Age group (ref: 18–29)</b>				
14–17	0.23 [0.03–2.02]	0.185	0.50 [0.14–1.81]	0.290
18–29	1.00 [ref]		1.00 [ref]	
30–49	0.87 [0.42–1.79]	0.704	1.38 [0.86–2.23]	0.182
50+	1.72 [0.78–3.76]	0.176	1.23 [0.72–2.12]	0.448
<b>Marital Status (ref: currently married)</b>				
Never married	0.94 [0.50–1.79]	0.860	1.00 [0.65–1.54]	0.988
Divorced/separated/widowed	1.37 [0.68–2.76]	0.375	1.05 [0.66–1.66]	0.846
<b>Household income (ref: 1st quartile: high)</b>				
2nd quartile (high-average)	0.94 [0.34–2.62]	0.911	1.48 [0.87–2.53]	0.146
3rd quartile (low average)	1.14 [0.44–2.93]	0.790	1.62 [0.90–2.93]	0.106
4th quartile (low)	2.08 [0.75–5.78]	0.156	2.32 [1.14–4.72]	0.022
<b>Personal income (ref: 1st quartile: high)</b>				
2nd quartile (high-average)	2.06 [0.82–5.16]	0.121	1.12 [0.65–1.91]	0.679
3rd quartile (low average)	0.74 [0.24–2.26]	0.588	1.02 [0.55–1.90]	0.950
4th quartile (low)	0.79 [0.26–2.34]	0.663	0.82 [0.39–1.74]	0.599
<b>Remoteness (ref: major cities)</b>				
Inner regional	0.98 [0.52–1.86]	0.949	1.03 [0.71–1.49]	0.870
Outer regional, remote, or very remote	0.52 [0.25–1.12]	0.095	1.13 [0.71–1.80]	0.609
<b>Education status (ref: bachelor or higher)</b>				
High school or less	1.71 [0.73–4.00]	0.217	1.48 [0.91–2.42]	0.113
<b>Certificate or diploma</b>				
<b>Country of birth (ref: Outside of Australia)</b>				
Australia	2.25 [1.13–4.47]	0.022	1.17 [0.72–1.89]	0.523
<b>Employment (ref: currently employed)</b>				
Not in labour force	1.99 [0.93–4.27]	0.075	0.93 [0.54–1.60]	0.782
Unemployed	1.46 [0.48–4.46]	0.487	0.70 [0.40–1.24]	0.220
<b>Self-reported conditions in past 12 m (ref: no)</b>				
Cancer	4.19 [1.42–12.41]	0.011	2.01 [0.83–4.87]	0.122
Chronic pain	11.02 [6.39–19.02]	<0.001	4.84 [3.29–7.11]	<0.001
<b>Psychological distress (ref: K10- low)</b>				
K10 - moderate	1.10 [0.59–2.04]	0.770	1.13 [0.77–1.66]	0.539
K10 - high to very high	1.44 [0.78–2.66]	0.246	1.32 [0.89–1.95]	0.173

**Table 1 (continued)**

	Odds ratios of past 12 months medicinal cannabis use among people who used cannabis (Ref: recreational use only)			
	Medicinal cannabis use only OR (95% CI)	p	Both medicinal and recreational OR (95% CI)	p
<b>Recent substance use (ref: no)</b>				
Opioids	1.58 [0.60–4.18]	0.358	1.82 [1.14–2.90]	0.012
Alcohol	0.40 [0.18–0.88]	0.023	0.64 [0.29–1.42]	0.270
Meth/amphetamine	0.12 [0.04–0.39]	<0.001	0.73 [0.43–1.23]	0.235
Cocaine	0.50 [0.23–1.06]	0.070	0.86 [0.56–1.32]	0.485
Hallucinogens	0.88 [0.30–2.53]	0.808	2.71 [1.63–4.51]	<0.001

All variables were entered into one regression model simultaneously.

\*There was a significant age by sex interaction (p = 0.016).

### 3. Results

#### 3.1. Prevalence of medicinal cannabis use

The prevalence of any medicinal use of cannabis in the past year was 2.6% [95% CI = 2.4–2.9]; 3.2% in males [95% CI = 2.7–3.6], 2.1% in females [95% CI = 1.8–2.4] (Fig. 1). Most who used cannabis for medicinal purposes (70.2%) also used for recreational purposes. Just under 1% (0.8% of both sexes) had only used cannabis for medicinal purposes. This corresponded to an estimated number of 83 thousand [59–108k] males and 81 thousand [56–105k] females (see Table S1). Among individuals who reported any use of cannabis for medicinal purposes, 95.9% [94.0–97.7] reported the use of medicinal cannabis that was not prescribed by a doctor.

#### 4. Correlates of medicinal cannabis use

Medicinal cannabis use only (compared to recreational use only) was more common in people who reported having cancer (OR = 4.19 [95% CI = 1.42–12.41]) and chronic pain (OR = 11.02 [95% CI = 6.39–19.02]) (see Table 1). Alcohol (OR = 0.40 [95% CI = 0.18–0.88]) and meth/amphetamine use (OR = 0.12 [95% CI = 0.04–0.39]) were associated with lower odds of medicinal use only (compared to recreational use only). Opioids (OR = 1.82 [95% CI = 1.14–2.90]) and hallucinogens (OR = 2.71 [95% CI = 1.63–4.51]) were associated with higher odds of using cannabis for both medicinal and recreational reasons (compared to recreational use only). A significant interaction between age and sex indicated that medicinal use only was more common among females aged 50 years or older (p = 0.016) than recreational use only.

#### 5. Discussion

In 2019, only 0.8% of Australians self-reported using cannabis solely for medicinal reasons. Nearly all (95.9%) did so without a doctor's prescription, consistent with previous surveys of persons who self-identified as individuals who used medical cannabis (Lintzeris et al., 2018; Lintzeris et al., 2020). In the previous surveys, people who used cannabis for medical reasons identified that barriers to accessing cannabis through legal pathways included the stigma surrounding drug use, lack of interest in prescribing by their doctors, and higher costs of prescribed than illicit cannabis (Lintzeris et al., 2020). These findings are important as they suggest that barriers remain for individuals to acquire cannabis legally through the medical system.

Our findings may have under-estimated the prevalence of medicinal cannabis use in the population due to the potential for under-reporting,

if individuals may not have been willing to disclose their cannabis use due to the associated stigma. Previously, Australia's medical cannabis system, the 2016 National Special Access Scheme, has been criticised because of the difficulties for patients to get access, reluctance to prescribe from doctors, and the costs of approved medical cannabis products being perceived as excessive (Arnold et al., 2020). The National Special Access Scheme has since been streamlined and the number of patients accessing cannabis via the TGA has increased to over 65,000 with 13,000 approvals in September 2021 (Therapeutic Goods Administration, 2021).

A previous study found that older Australians and those with chronic pain were more supportive of legalising cannabis for medicinal use than other groups (Chiu et al., 2021). The current study found that the use of medicinal cannabis was associated with cancer and chronic pain. The use of cannabis for both medicinal and non-medicinal reasons was associated with opioid use, perhaps because people who use medicinal cannabis to manage symptoms of cancer or chronic pain may also be using opioids. Cannabis has been proposed as a substitute for opioids, however opioid-related harms have not been reduced in US jurisdictions following cannabis legalisation (Shover et al., 2019). Our current observations are comparable with a recent paper that found that more opioids are used when cannabis is used, suggesting that cannabis may not be a substitute for opioids (Gorfinkel et al., 2021).

We found that while females and older individuals who used cannabis were more likely to use it only for medicinal reasons, younger adults aged 18–29 years still had the highest overall prevalence of use. This highlighted that while there may be public perception that medicinal cannabis may be used by older adults with chronic conditions, indeed it is still more prevalent among younger adults. This is consistent with a US study that found that young adults were the major purchasers in medical cannabis dispensaries (Haug et al., 2017). The quantity of cannabis used and rates of problematic cannabis use were also higher among the younger consumers (Haug et al., 2017). The medical cannabis scheme in the USA has been criticised for the ease of access by youth who could obtain cannabis for recreational use (D'Amico et al., 2020).

Our results are limited by the fact that “medicinal use” was self-reported. The NDSHS does not provide good estimates of the prevalence of adolescent cannabis use because there were only 597 persons aged 14–17 sampled, among whom <10 reported medicinal use. Future research should examine the prevalence and impacts of medicinal cannabis among Australia's youth. Further, we used the most recent Australian population drug survey available to date, conducted in 2019 after cannabis had been legalised for medical use but not for recreational use. Future studies when updated estimates become available to monitor the trends in medicinal cannabis use and prescribing is warranted.

In conclusion, three years after the legalization of medical cannabis in Australia, the prevalence of self-reported cannabis use solely for medicinal reasons remains under 1%, was associated with individual chronic conditions and other substance use characteristics, and most who used medicinal cannabis did not have a prescription for the drug and therefore purchased it in the illicit market. Future research to monitor trends and long-term outcomes of cannabis use for medicinal purposes is warranted.

#### CRedit authorship contribution statement

**Janni Leung:** Conceptualization, Methodology, Formal analysis, Writing – review & editing. **Carmen C.W. Lim:** Formal analysis, Writing – original draft, Data curation, Writing – review & editing. **Vivian Chiu:**

Writing – original draft, Writing – review & editing. **Jack Chung:** Writing – original draft, Writing – review & editing. **Tesfa Mekonen:** Writing – original draft, Writing – review & editing. **Danielle Dawson:** Writing – original draft, Writing – review & editing. **Wayne D. Hall:** Conceptualization, Methodology, Writing – review & editing. **Gary C.K. Chan:** Conceptualization, Methodology, Writing – review & editing.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2022.100436>.

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