

Prevalence and correlates of non-daily and daily cannabis use among persons 15 years and older in South Africa: Results of a national survey in 2017

Shandir Ramlagan

Human Sciences Research Council

Karl Peltzer (✉ kfpeltzer@gmail.com)

University of the Free State <https://orcid.org/0000-0002-5980-0876>

Supa Pengpid

Mahidol University

Research

Keywords: cannabis use, substance use, adolescents, adults, health variables, South Africa

Posted Date: December 3rd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-116225/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published on March 20th, 2021. See the published version at <https://doi.org/10.1186/s13011-021-00364-z>.

Abstract

Background

The study aimed to assess the prevalence and correlates of non-daily and daily cannabis use among persons 15 years and older in South Africa.

Method

In a national cross-sectional 2017 survey, 39,207 persons 15 years and older (Median = 34 years) responded to a questionnaire on substance use and health variables. Multinomial logistic regression was used to assess the determinants of nondaily and daily cannabis use and logistic regression for the determinants of daily cannabis use among active cannabis users.

Results

Results indicate that 5.0% of the participants engaged in non-daily and 2.8% in daily cannabis use in the past 3 months. In adjusted multinomial logistic regression analysis, male sex, having Grade 8–11 education, Coloureds, alcohol use disorder, living with husband or wife, not living with a partner, and other drug use were positively and students were negatively associated with daily cannabis use. Male sex, younger age, living alone or single, living with a partner, alcohol use disorder, and other drug use were positively and multimorbidity was negatively associated with nondaily cannabis use. Compared to nondaily cannabis users, male sex had higher odds and students and other drug use had lower odds of daily cannabis use.

Conclusion

About one in ten participants engaged past 3-month cannabis use, and several sociodemographic and health indicators were identified associated with non-daily and daily cannabis use.

Introduction

Cannabis is the genus name of a plant from the Cannabaceae family [1] and cannabis is also the name associated with the drug produced from this plant [2]. Common names of cannabis in South Africa also include dagga, zol [3] and marijuana [4]. Globally, cannabis is the most commonly used drug [5]. The World Drug Report states that from 2010–2016, the increase in cannabis use appears to have been greatest in Africa and Asia [5]. According to statistics from the United Nations Office on Drugs and Crime (UNODC), globally in 2018, the annual prevalence of cannabis use was 3.86% [6].

In terms of cannabis usage in different countries around the world, the prevalence of past 12-month cannabis use in Australia was 6% in 2012 [7] and the annual prevalence in 2016 was 10.4% [2]. Annual prevalence of cannabis use in the United States of America was 18.4% in 2017, 14.03% in New Zealand in 2017, 9.3% in Uruguay in 2014, 2.5% in Brazil in 2016 and 3.3% in Bangladesh in 2004 [6] to state a few.

In terms of UNODC cannabis statistics for South Africa, the organisation reports an annual cannabis prevalence at 3.65% in 2011, and that 43.3% of people in 2018 were in treatment facilities for cannabis [6].

In terms of a national population-based South African study, a 2012 study on persons 15 years and older reported the prevalence of past 3-month cannabis use at 4.0% [8]. More recent South African data on cannabis use can be found from treatment centre data that shows that cannabis is the most used drug in South African treatment facility cases in the second half of 2016 [9] and the first half of 2017 [10]. The treatment facility reports although are limited as they only record the number of patients seeking treatment and the substances they are seeking treatment for. There is a lack of more recent national population-based data on the prevalence and correlates of nondaily and daily cannabis use in South Africa.

Risk factors for cannabis use or cannabis use disorder include sociodemographic factors and health variables. Sociodemographic risk factors for cannabis use include male sex [7, 11–14], younger age [11, 7, 13], divorced, separated, never married [15], unemployed, living without a partner, higher education, and lower education [11]. Health variable risk factors include other illicit drug use [11, 12], alcohol use disorder [7, 11, 12, 14], psychological distress [16, 17], having no chronic conditions [12] and less frequent primary health care utilization [18, 19].

Cannabis is not indigenous to southern Africa; it is the most common illicit substance used in South Africa; it is inexpensive; it is easy to produce with South Africa being a large producer of cannabis, and the law prohibiting possession is infrequently enforced [3]. In terms of law, South Africa followed international treaties making cannabis usage a criminal offense [4], with the Prevention of and Treatment of Substance Abuse Act 70 of 2008 speaking to the National Drug Master Plan on supply, demand and harm reduction [20]. These laws focused more towards drug trafficking [4] and thus not towards the individual user.

Epidemiological population-based surveys are needed to target interventions to prevent cannabis use. The study aimed to assess the prevalence and correlates of non-daily and daily cannabis use among persons 15 years and older in South Africa.

Methods

Study design and participants

A cross-sectional, nationally representative survey of persons 15 years and older in 2017 living in South Africa was analysed. This multistage stratified random cluster population-based household sample is described elsewhere [21]. In brief, the 2015 national population sampling frame [22] was utilized to draw 1000 small area layers (SALs) that were stratified by South Africa's nine provinces, and locality types. In each of the 1000 SALs, 15 households were randomly selected to participate and all individuals living in the selected household that slept there the night before were invited to participate. It is important to point

out that this paper utilized racial categorization where “Coloured” or mixed race is defined children born to parents of Black African and either White and/or Indian/Asian race groups as per South Africa’s Apartheid government’s Act 30 of 1950. This is done to correct the inequalities of the previous apartheid regime.

Study procedures

Participants were handed an informed consent form to read together with a trained interviewer. If the participant agreed to participate, they signed the consent form. For those younger than 18 years old, parental consent was sought together with youth assent. If either the youth or the parent did not sign the assent/consent form, no interview was conducted. All interviews were done in private and kept confidential. The questionnaire was electronic, the interviewer administered and completed on a tablet using CSPro software. Data collection started in December 2016 and ended in February 2018. The household response rate was 82.2% and the individual response rate to be interviewed was 93.6% [21]. The participants did not receive any payment or gifts for the interview. For this paper, we restricted the sample to those with complete cannabis use measurement.

Measures

Non-daily and daily cannabis use was assessed using the question: “In the past three months, how often have you used cannabis (dagga, marijuana, pot, grass, hash, etc.)?” from the “Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)” [23]. Response options were “Never, once or twice, monthly, weekly, or almost daily.” “Non-daily” was defined as “once or twice, monthly, or weekly” and “almost daily” as “daily” cannabis use.

Past three months, other drug use was assessed with six items (cocaine, amphetamine, inhalants, sedatives, hallucinogens, and opiates) from the (ASSIST)” [23]. The six items were summed to define any other drug use in the past 3 months. Cronbach’s alpha for the 6-item other drug use measure was 0.97 in this sample.

Alcohol use disorder was assessed using the Alcohol Use Disorders Identification Test (AUDIT) [24] and was scored as in a previous survey in South Africa [25]. Among adults (20 years and above) a cut-off score of 8 or more [24] and among adolescents (15-19 years), 5 or more [26] for classifying alcohol use disorder. (Cronbach alpha 0.87 in this sample).

Sociodemographic factors included age, sex, highest educational level, living status, population group, employment status, and residence status [21].

Psychological distress was assessed with the Kessler Psychological Distress Scale (K10), with scores 20 or more indicating psychological distress [27]. Cronbach’s alpha for the K10 was 0.92 in this sample.

Multimorbidity was assessed with self-reported health care provider diagnosed hypertension, diabetes, HIV positive, cancer and heart disease.

Health care utilization was sourced from the question: When was the last time you went to see a health professional (doctor, nurse, traditional healer, etc.)? Response options ranged from 1=within the last 6 months to 4=never.

Data analysis

All statistical analyses were conducted using STATA software version 14.0 (Stata Corporation, College Station, TX, USA). The data were weighted to make the sample representative of the target population in South Africa. Descriptive statistics were used to summarize the sample and cannabis use prevalence characteristics. Unadjusted and adjusted (including variables significant at $p < 0.05$ in univariate analysis) multinomial logistic regression was used to predict nondaily and daily cannabis use, with no past 3-month cannabis use as the reference category. In addition, unadjusted and adjusted (including variables significant at $p < 0.05$ in univariate analysis) logistic regression was used among active (past 3 months) cannabis users to predict daily versus nondaily cannabis use. Taylor linearization methods were applied to account for the complex study design and the sampling weight. Results from (multinomial) logistic regression analyses are reported as (relative risk ratios) odds ratios (ORs), and 95% confidence intervals (CIs). Missing values (<1.8% for any study variable) were excluded and $p < 0.05$ considered significant.

Results

Characteristics of the sample and cannabis use

The sample comprised 39,207 persons 15 years and older (Median = 34 years, interquartile range = 25–48), 48.3% were men, and 51.7% were women, 36.1% had Grade 12 or more education, and 79.3% were Black African by population group or ethnicity. More than one in three participants (36.0%) were employed or self-employed, 69.0% lived in urban areas, 20.5% reported psychological distress, 4.9% multimorbidity, and 47.3% past 6-month health care utilization. More than one in ten respondents (10.3%) had an alcohol use disorder, and 2.8% used drugs other than cannabis in the past 3 months. Five percent of the participants engaged in non-daily and 2.8% in daily cannabis use in the past 3 months (Table 1).

Table 1
Sample characteristics and distribution of cannabis use

Variable	Sample	Past 3-month cannabis use		
		Never (N = 36503)	Non-daily (N = 1747)	Almost daily (N = 957)
	N (%)	%	%	%
All	39207	92.2	5.0	2.8
Sex	23102 (51.7)	96.5	3.1	0.4
Female		87.7	7.1	5.3
Male	16105 (48.3)			
Age in years	15524 (38.1)	90.5	6.3	3.3
15–29		91.6	5.2	3.3
30–44	10604 (32.4)	95.2	3.2	1.6
45 or more	13079 (29.5)			
Education	16887 (37.3)	93.6	4.6	1.8
Grade 0–7		89.9	5.5	4.6
Grade 8–11	9876 (26.6)	92.6	5.0	2.5
Grade 12 or more	12367 (36.1)			
Living status	9595 (26.6)	95.3	3.3	1.4
With husband/wife		90.8	5.8	3.4
Alone/single ^a	19346 (47.3)	90.2	6.3	3.5
Live with partner ^b	2563 (7.4)	92.3	4.7	2.9
Not live with partner ^c	7501 (18.7)			

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together

Variable	Sample	Past 3-month cannabis use		
Population group	30670 (79.3)	92.3	4.9	2.8
African Black	1924 (9.0)	93.7	4.8	1.4
White	4304 (8.8)	89.7	6.0	4.2
Coloured	2309 (2.9)	93.9	4.9	1.2
Indian or Asian				
Employment status	11937 (36.0)	91.9	4.7	3.4
Employed/self-employed	20649 (50.2)	92.1	5.1	2.8
Unemployed	5393 (12.4)	93.5	5.4	1.0
Student/pupil/learner	748 (1.4)	94.0	4.1	1.8
Sick/disabled/unable/other				
Residence	13584 (26.0)	93.4	4.8	1.8
Rural informal (tribal areas)	4266 (5.0)	92.3	5.2	2.5
Rural (farms)	21357 (69.0)	91.8	5.1	5.1
Urban				
Alcohol use disorder	36067 (89.7)	93.8	4.2	2.0
No	3087 (10.3)	78.3	11.9	9.8
Yes				
Other drugs	37991 (97.2)	94.1	3.5	2.4
No	1084 (2.8)	32.4	55.9	11.7
Yes				
Psychological distress	31304 (79.5)	92.4	4.9	2.7
No	7751 (20.5)	91.4	5.4	3.2
Yes				

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together

Variable	Sample	Past 3-month cannabis use		
Multimorbidity	29394 (77.2)	91.3	5.5	3.2
0		94.6	3.8	1.6
1	7056 (17.9)	97.7	2.0	0.4
2 or more	2279 (4.9)			
Health care utilization	20823 (52.7)	90.8	5.7	3.6
No		93.8	4.3	1.9
Yes	18232 (47.3)			

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together

Associations with non-daily and daily cannabis use

In adjusted multinomial logistic regression analysis, male sex, having Grade 8–11 education, Coloureds, alcohol use disorder, living with a husband or wife, not living with a partner, and other drug use were positively while students were negatively associated with daily cannabis use. Male sex, younger age, living alone or single, living with a partner, alcohol use disorder, and other drug use were positively while multimorbidity was negatively associated with nondaily cannabis use. In addition, in univariate multinomial logistic regression, urban residence was positively and Whites and Indians or Asians were negatively associated with daily cannabis use (Tables 2 and 3).

Table 2
Simple multinomial regression with cannabis use

Variable	Non-daily cannabis use		Almost daily cannabis use	
	Crude RRR (95% CI)	p-value	Crude RRR (95% CI)	p-value
Sex	1 (Reference)	< 0.001	1 (Reference)	< 0.001
Female	2.52 (2.06, 3.09)		13.35 (9.11, 19.58)	
Male				
Age in years	1 (Reference)	< 0.001	1 (Reference)	< 0.001
45 or more	1.69 (1.36, 2.09)	< 0.001	2.06 (1.43, 2.96)	< 0.001
30–44	2.08 (1.68, 2.57)		2.08 (1.49, 2.91)	
15–29				
Education	1 (Reference)	0.042	1 (Reference)	< 0.001
Grade 0–7	1.25 (1.01, 1.57)	0.404	2.60 (1.97, 3.44)	0.037
Grade 8–11	1.09 (0.89, 1.35)		1.36 (1.02, 1.81)	
Grade 12 or more				
Living status	1 (Reference)	< 0.001	1 (Reference)	< 0.001
With husband/wife	1.82 (1.44, 2.29)	< 0.001	2.63 (1.72, 4.01)	< 0.001
Alone/single ^a	1.99 (1.38, 2.87)	0.009	2.70 (1.55, 4.69)	0.003
Live with partner ^b	1.47 (1.10, 1.95)		2.21 (1.31, 3.74)	
Not live with partner ^c				
Population group	1 (Reference)	0.836	1 (Reference)	0.032
African Black	0.97 (0.71, 1.32)	0.086	0.50 (0.27, 0.94)	0.006
White	1.27 (0.97, 1.66)	0.913	1.54 (1.13, 2.08)	0.002
Coloured	0.98 (0.95, 1.47)		0.42 (0.24, 0.73)	
Indian or Asian				

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together; RRR = Relative Risk Ratio; CI = Confidence Interval.

Variable	Non-daily cannabis use		Almost daily cannabis use	
Employment status	1 (Reference)	0.499	1 (Reference)	0.170
Employed/self-employed	1.07 (0.88, 1.29)	0.395	0.83 (0.63, 1.09)	< 0.001
Unemployed	1.13 (0.86, 1.48)	0.558	0.30 (0.19, 0.47)	0.187
Student/pupil/learner	0.85 (0.49, 1.47)		0.53 (0.21, 1.36)	
Sick/disabled/unable/other				
Residence	1 (Reference)	0.472	1 (Reference)	0.187
Rural informal (tribal areas)	1.12 (0.83, 1.51)	0.474	1.39 (0.85, 2.29)	0.003
Rural (farms)	1.09 (0.86, 1.37)		1.77 (1.22, 2.59)	
Urban				
Alcohol use disorder	1 (Reference)	< 0.001	1 (Reference)	< 0.001
No	3.88 (2.68, 4.28)		5.88 (4.54, 7.63)	
Yes				
Other drugs	1 (Reference)	< 0.001	1 (Reference)	< 0.001
No	46.89 (34.72, 63.33)		13.96 (9.04, 21.54)	
Yes				
Psychological distress	1 (Reference)	0.412	1 (Reference)	0.254
No	1.11 (0.86, 1.43)		1.22 (0.87, 1.72)	
Yes				
Multimorbidity	1 (Reference)	< 0.001	1 (Reference)	< 0.001
0	0.66 (0.53, 0.82)	< 0.001	0.50 (0.33, 0.76)	< 0.001
1	0.34 (0.21, 0.53)		0.11 (0.04, 0.33)	
2 or more				
Health care utilization	1 (Reference)	< 0.001	1 (Reference)	< 0.001
No	0.72 (0.61, 0.85)		0.52 (0.39, 0.69)	
Yes				
^a Living on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^b Living together with boyfriend/girlfriends/civil union; ^c Single/divorced/widowed, in steady relationship but not living together; RRR = Relative Risk Ratio; CI = Confidence Interval.				

Table 3

Multivariable multinomial regression with non-daily and daily cannabis use (reference no past 3-month cannabis use)

Variable	Non-daily cannabis use		Almost daily cannabis use	
	Adjusted RRR (95% CI)	p-value	Adjusted RRR (95% CI)	p-value
Sex	1 (Reference)	< 0.001	1 (Reference)	< 0.001
Female	2.16 (1.73, 2.70)		10.37 (6.75, 15.94)	
Male				
Age in years	1 (Reference)	0.039	1 (Reference)	0.588
45 or more	1.32 (1.01, 1.71)	0.009	1.11 (0.75, 1.64)	0.312
30–44	1.50 (1.11, 2.04)		1.23 (0.82, 1.83)	
15–29				
Education	1 (Reference)	0.256	1 (Reference)	< 0.001
Grade 0–7	1.17 (0.89, 1.53)	0.913	1.68 (1.23, 2.29)	0.883
Grade 8–11	1.02 (0.76, 1.37)		0.97 (0.69, 1.37)	
Grade 12 or more				
Living status	1 (Reference)	0.007	1 (Reference)	< 0.001
With husband/wife	1.49 (1.12, 1.99)	0.042	2.44 (1.56, 3.83)	0.052
Alone/single ^a	1.58 (1.02, 2.45)	0.053	1.79 (0.99, 3.22)	0.006
Live with partner ^b	1.38 (1.00, 1.92)		2.14 (1.25, 3.66)	
Not live with partner ^c				
Population group	1 (Reference)	0.063	1 (Reference)	0.639
African Black	1.43 (0.98, 2.10)	0.265	0.84 (0.40, 1.75)	0.011
White	1.20 (0.87, 1.66)	0.529	1.54 (1.10, 2.15)	0.107
Coloured	1.18 (0.70, 1.99)		0.55 (0.29, 1.07)	
Indian or Asian				

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together; RRR = Relative Risk Ratio; CI = Confidence Interval.

Variable	Non-daily cannabis use		Almost daily cannabis use	
Employment status	1 (Reference)	0.534	1 (Reference)	0.533
Employed/self-employed	1.08 (0.84, 1.40)	0.952	0.90 (0.64, 1.26)	< 0.001
Unemployed	0.99 (0.66, 1.47)	0.688	0.25 (0.14, 0.45)	0.160
Student/pupil/learner	0.88 (0.49, 1.61)		0.50 (0.19, 1.32)	
Sick/disabled/unable/other				
Residence	1 (Reference)	0.936	1 (Reference)	0.936
Rural informal (tribal areas)	1.02 (0.70, 1.46)	0.769	1.02 (0.70, 1.46)	0.769
Rural (farms)	0.96 (0.74, 1.25)		0.96 (0.74, 1.25)	
Urban				
Alcohol use disorder	1 (Reference)	< 0.001	1 (Reference)	< 0.001
No	2.89 (2.16, 3.88)		3.21 (2.42, 4.28)	
Yes				
Other drugs	1 (Reference)	< 0.001	1 (Reference)	< 0.001
No	49.65 (33.93, 72.64)		14.40 (8.82, 23.51)	
Yes				
Multimorbidity	1 (Reference)	0.351	1 (Reference)	0.077
0	0.87 (0.65, 1.17)	0.004	0.85 (0.53, 1.37)	0.107
1	0.47 (0.28, 0.79)		0.23 (0.07, 0.76)	
2 or more				
Health care utilization	1 (Reference)	0.362	1 (Reference)	0.107
No	0.92 (0.76, 1.11)		0.77 (0.57, 1.06)	
Yes				

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together; RRR = Relative Risk Ratio; CI = Confidence Interval.

Associations with daily cannabis use among active cannabis users

In adjusted logistic regression, compared to nondaily cannabis users, male sex had a higher odds and students and other drug use had lower odds of daily cannabis use. In addition, in univariate analysis,

grades 8–11, urban residence, and alcohol use disorder were positively, and Whites and Indians or Asians and health care utilization were negatively associated with daily cannabis use (Table 4).

Table 4
 Logistic regression with daily cannabis use among active cannabis users (N = 1728)

Variable	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Sex	1 (Reference)	< 0.001	1 (Reference)	< 0.001
Female (23.4%)	5.29 (3.40, 8.25)		3.94 (2.40, 6.47)	
Male (76.6%)				
Age in years	1 (Reference)	0.351	—	
45 or more (18.3%)	1.22 (0.80, 1.86)	0.999		
30–44 (35.1%)	1.00 (0.68, 1.47)			
15–29 (46.7%)				
Education	1 (Reference)	< 0.001	1 (Reference)	0.215
Grade 0–7 (30.9%)	2.07 (1.46, 2.94)	0.248	1.29 (0.86, 1.93)	0.486
Grade 8–11 (34.6%)	1.24 (0.86, 1.79)		0.85 (0.54, 1.34)	
Grade 12 or more (34.5%)				
Living status	1 (Reference)	0.134	—	
With husband/wife (16.1%)	1.46 (0.89, 2.34)	0.377		
Alone/single (56.1%) ^a	1.36 (0.69, 2.67)	0.158		
Live with partner (9.3%) ^b	1.51 (0.85, 2.68)			
Not live with partner (18.5%) ^c				
Population group	1 (Reference)	0.049	1 (Reference)	0.123
African Black (78.9%)	0.52 (0.27, 1.00)	0.310	0.57 (0.28, 1.17)	0.833
White (7.2%)	1.21 (0.83, 1.76)	0.003	1.05 (0.68, 1.65)	0.085
Coloured (11.6%)	0.43 (0.24, 0.75)		0.53 (0.26, 1.09)	
Indian or Asian (2.3%)				

^aLiving on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^bLiving together with boyfriend/girlfriends/civil union; ^cSingle/divorced/widowed, in steady relationship but not living together; OR = Odds Ratio; CI = Confidence Interval.

Variable	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Employment status	1 (Reference)	0.137	1 (Reference)	0.125
Employed/self-employed (37.7%)	0.77 (0.55, 1.09)	< 0.001	0.73 (0.49, 1.09)	< 0.001
Unemployed (50.9%)	0.26 (0.15, 0.45)	0.396	0.21 (0.11, 0.40)	0.516
Student/pupil/learner (10.3%)	0.63 (0.21, 1.85)		0.68 (0.21, 2.18)	
Sick/disabled/unable/other (1.1%)				
Residence	1 (Reference)	0.372	1 (Reference)	0.967
Rural informal (tribal areas) (22.0%)	1.25 (0.77, 2.04)	0.012	1.01 (0.59, 1.75)	0.051
Rural (farms) (5.0%)	1.63 (1.12, 2.38)		1.56 (1.00, 2.45)	
Urban (73.1%)				
Alcohol use disorder	1 (Reference)	< 0.001	1 (Reference)	0.051
No (71.3%)	1.74 (1.24, 2.43)		1.43 (1.00, 2.05)	
Yes (28.7%)				
Other drugs	1 (Reference)	< 0.001	1 (Reference)	< 0.001
No (74.9%)	0.30 (0.19, 0.47)		0.32 (0.21, 0.50)	
Yes (25.1%)				
Psychological distress	1 (Reference)	0.646	—	
No (77.4%)	1.10 (0.73, 1.65)			
Yes (22.6%)				
Multimorbidity	1 (Reference)	0.276	—	
0 (86.1%)	0.76 (0.47, 1.24)	0.062		
1 (12.4%)	0.32 (0.10, 1.06)			
2 or more (1.5%)				
Health care utilization	1 (Reference)	0.048	1 (Reference)	0.116
No (62.5%)	0.72 (0.51, 1.00)		0.77 (0.55, 1.34)	
Yes (37.5%)				
^a Living on own or other arrangement but not living with husband / wife or Single; not in a steady relationship; ^b Living together with boyfriend/girlfriends/civil union; ^c Single/divorced/widowed, in steady relationship but not living together; OR = Odds Ratio; CI = Confidence Interval.				

Discussion

This paper utilized data from a large nation population based household survey in 2017 to assess the prevalence and correlates of non-daily and daily cannabis use among persons 15 years and older living in South Africa. It found that the prevalence of cannabis use in the past 3 months was 5% being nondaily and 2.8% being daily cannabis use. This finding shows a considerable increase from previous studies where the prevalence of past 3 months cannabis use was found to be 4% [8] and 3.3% [4] during the 2012 and 2008 surveys which used the same survey methodology. During the same period as this survey, treatment study data showed that cannabis is the most used drug in South African treatment facility cases [9, 10].

The 2017 survey findings almost doubled that of the survey done in 2012 and could be attributed to the ease of access to cannabis and it being cost effective [3, 8]. It is also important to mention that previous studies have stated that laws surrounding cannabis restrictions were in place during the survey period yet, but the enforcement of those laws were not geared to the single end user but rather to the drug trafficker [3, 4, 20]. Although cannabis use was illegal during the survey period, the medical benefits of cannabis [2] have been voiced and decriminalization propagated in South Africa [20]. All of this coupled together could potentially seem as although cannabis is more tolerated in South African society, thus leading to increased usage. The increase, although, almost double from the previous survey, is alarming.

Evidence from this analysis suggests that males are significantly associated with cannabis use; a finding that is in agreement with previous published studies and South African treatment facility reports [3, 4, 7, 8, 11–14, 28, 31]. Although those participants having Grade 8–11 education made up a quarter of the study population aged 15 years and older, this study found that they are positively associated with daily cannabis use. This finding is in contravention of the 2008 finding which showed that having a grade 8–11 educational level was protective for men [4] nor the 2012 finding which found no association between cannabis use and educational level [8]. This change from previous years is of concern as studies have shown that increasing cannabis use was associated with increasing risk of leaving school without qualifications [32, 33]. Interestingly, students had lower odds of daily cannabis use, which is a very promising outcome.

Respondents from the Coloured population group had significantly higher odds for daily cannabis use. This finding parallels previous cannabis and other drug studies [3, 4, 8, 34]. The coloured population could be experiencing increased stressors which could account for the positive association. As found in previous research [7, 15], living with a husband or wife was found protective against cannabis use. It is possible that people living alone or single or not living with a partner engage in daily cannabis use because of being disadvantaged in forming relationships [7]. Those with alcohol use disorder and those who have reported other drug use were significantly associated with daily and nondaily cannabis use. These finds are similar to other research where it would seem that cannabis and alcohol usage are interlinked [7, 11, 12, 14, 36] as well as cannabis and other drug usage [11, 12]. Interestingly, the adjusted logistic regression showed that among cannabis users, other drug use had lower odds of daily cannabis

use and could be due to other drug users not considering cannabis as their primary drug. These findings do suggest that interventions regarding reducing cannabis, alcohol, and other drug usage should be integrated.

Those respondents who had multiple diseases or conditions were negatively associated with nondaily cannabis use. Similar results were found among middle-aged and older adults in the United States [12]. This result seems to indicate that cannabis use in this study was more likely used for recreational than medicinal purposes for multiple chronic conditions. Unlike some previous research [16, 17], this survey did not show an association between psychological distress and non-daily or daily cannabis use. In line with previous studies on risky alcohol use [18, 19], this study found an association between less frequent primary health care utilization and non-daily and daily cannabis use. It is possible that those with cannabis use more frequently attend hospital or emergency medical services

Study limitations

The study was limited by its cross-sectional design and self-report of data, including substance use. Cannabis and other drug use were only assessed with a shortened version of the ASSIST, not allowing us to report on cannabis and other drug use disorders, as well as tobacco use disorders. However, it has been estimated [37] that one-third of almost daily cannabis users would fulfil the criteria of DSM III cannabis dependence. Another limitation was that the motivation of cannabis use, such as medicinal or recreational, was not assessed, and should be included in future studies.

Conclusions

In this large national population-based survey among persons 15 and older in 2017 in South Africa, almost one in ten participants engaged past 3month cannabis use, and several sociodemographic (male sex, younger age, having Grade 8–11 education, Coloureds, living with a husband or wife, not living with a partner) and health indicators (alcohol use disorder, other drug use and no multimorbidity) were identified that were associated with non-daily and/or daily cannabis use. Among active cannabis users, other drug use had lower odds of daily cannabis use.

Abbreviations

ASSIST: Alcohol, Smoking and Substance Involvement Screening Test; AUDIT:Alcohol Use Disorders Identification Test; DSM:Diagnostic and Statistical Manual of Mental Disorders; K10:Kessler Psychological Distress Scale; SALs:small area layers

Declarations

Ethics approval and consent to participate

The Human Sciences Research Council (HSRC) Research Ethics Committee (REC: 4/18/11/15) granted ethical approval for the survey. Approval was also granted by the CDC's Center for Global Health (CGH).

Consent for publication

Not applicable.

Availability of data and materials

The dataset used and/or analysed during the current study is available from the

Human Sciences Research Council [distributor] 2020. <http://dx.doi.org/doi:10.14749/1585345902>.

Competing interests

The authors declare that they have no competing interests.

Funding: Bill and Melinda Gates Foundation, Centers for Disease Control and Prevention Human Sciences Research Council, President's Emergency Plan for AIDS Relief (Emergency Plan), South African National AIDS Council, United Nations Children's Fund.

Authors' contributions

"All authors fulfil the criteria for authorship. S.R., K.P. and S.P. conceived and designed the research, performed statistical analysis, drafted the manuscript and made critical revision of the manuscript for key intellectual content. All authors have read and agreed to the published version of the manuscript."

Acknowledgement

Human Sciences Research Council. *South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey (SABSSM) 2017: Combined - All provinces*. [Data set]. SABSSM 2017 Combined. Version 1.0. Pretoria South Africa: Human Sciences Research Council [producer] 2017, Human Sciences Research Council [distributor] 2020. <http://dx.doi.org/doi:10.14749/1585345902>.

References

1. Bhalla, A., Thirumalaikolundusubramanian, P., Fung, J., Cordero-Schmidt, G., Soghoian, S., Sikka, V.K., Dhindsa, H.S., & Singh, S. (2015). Native Medicines and Cardiovascular Toxicity. In M.S. Ramachandran (Ed.). *The Heart and Toxins* (pp. 175-202). San Diego, USA: Academic Press.
2. Whiting, P.F., Wolff, R.F., Deshpande, S., Di Nisio, M., Duffy, S., Hernandez, A.V., Keurentjes, J.C., Lang, S., Misso, K., Ryder, S., Schmidtkofer, S., Westwood, M., & Kleijnen, J. (2015). Cannabinoids for Medical Use: A Systematic Review and Meta-analysis. *Journal of the American Medical Association*, 313(24), 2456-73. DOI: 1001/jama.2015.6358

3. Peltzer, K., & Ramlagan, S. (2007). Cannabis use trends in South Africa. *South African Journal of Psychiatry*, 13(4), a33. doi: <https://doi.org/10.4102/sajpsychiatry.v13i4.33>
4. Peltzer, K., & Ramlagan, S. (2010). Illicit drug use in South Africa: Findings from a 2008 national population-based survey. *South African Journal of Psychiatry*, 16(1), 8-15.
5. United Nations Office on Drugs and Crime (UNODC). (2018). *World Drug Report 2018*. Vienna: UNODC.
6. (2020). DATAUNODC. Country lists. UNODC. Available at <https://dataunodc.un.org/content/country-list> (accessed 2 October 2020).
7. Teesson, M., Slade, T., Swift, W., Mills, K., Memedovic, S., Mewton, L., Grove, R., Newton, N., & Hall, W. (2012). Prevalence, correlates and comorbidity of DSM-IV Cannabis Use and Cannabis Use Disorders in Australia. *The Australian and New Zealand journal of psychiatry*, 46(12), 1182–1192. <https://doi.org/10.1177/0004867412460591>
8. Peltzer, K., & Phaswana-Mafuya, N. (2018). Drug use among youth and adults in a population-based survey in South Africa. *South African Journal of Psychiatry*, 24(0), a1139. <https://doi.org/10.4102/sajpsychiatry.v24i0.1139>
9. Dada, S., Burnhams, N.H., Erasmus, J., Parry, C., Bhana, A., Timol, F., & Fourie, D. (2017). Monitoring alcohol, tobacco and other drug use trends in South Africa: July – December 2016. Available at sahealthinfo.org/admodule/sacendu.htm (accessed 17 November 2020).
10. Dada, S., Burnhams, N.H., Erasmus, J., Parry, C., Bhana, A. (2018). Update January 2018 alcohol and other drug use trends: January – June 2017 (Phase 42). Available at sahealthinfo.org/admodule/sacendu.htm (accessed 17 November 2020).
11. Berge, J., Håkansson, A., & Berglund, M. (2014). Alcohol and drug use in groups of cannabis users: results from a survey on drug use in the Swedish general population. *The American Journal on Addictions*, 23(3), 272-9. doi: 10.1111/j.1521-0391.2014.12097.x. PMID: 24724885.
12. Han, B. H., & Palamar, J. J. (2018). Marijuana use by middle-aged and older adults in the United States, 2015-2016. *Drug and alcohol dependence*, 191, 374–381. <https://doi.org/10.1016/j.drugalcdep.2018.07.006>
13. Callaghan, R.C., Sanches, M., Benny, C., Stockwell, T., Sherk, A., & Kish, S.J. (2019). Who consumes most of the cannabis in Canada? Profiles of cannabis consumption by quantity. *Drug and Alcohol Dependence*. 205, 107587. doi: 10.1016/j.drugalcdep.2019.107587.
14. Ogborne AC, Smart RG. Cannabis users in the general Canadian population. *Subst Use Misuse*. 2000 Feb;35(3):301-11. doi: 10.3109/10826080009147698. PMID: 10714448.
15. Han, B. H., Ko, R., & Palamar, J. J. (2019). Substance Use by Adults with Medical Multimorbidity in the United States, 2015-2016. *Journal of general internal medicine*, 34(8), 1394–1396. <https://doi.org/10.1007/s11606-019-04980-1>
16. Weinberger, A. H., Pacek, L. R., Sheffer, C. E., Budney, A. J., Lee, J., & Goodwin, R. D. (2019). Serious psychological distress and daily cannabis use, 2008 to 2016: Potential implications for mental

- health?. Drug and alcohol dependence, 197, 134–140.
<https://doi.org/10.1016/j.drugalcdep.2019.01.010>
17. Votaw, V. R., McHugh, R. K., Vowles, K. E., & Witkiewitz, K. (2020). Patterns of Polysubstance Use among Adults with Tranquilizer Misuse. *Substance use & misuse*, 55(6), 861–870.
<https://doi.org/10.1080/10826084.2019.1708118>
 18. Miquel, L., Manthey, J., Rehm, J., Vela, E., Bustins, M., Segura, L., Vieta, E., Colom, J., Anderson, P., & Gual, A. (2018). Risky Alcohol Use: The Impact on Health Service Use. *European addiction research*, 24(5), 234–244. <https://doi.org/10.1159/000493884>
 19. Jenkins, K. R., & Zucker, R. A. (2010). The prospective relationship between binge drinking and physician visits among older adults. *Journal of aging and health*, 22(8), 1099–1113.
<https://doi.org/10.1177/0898264310376539>
 20. Stein D. J. (2016). Position statement on cannabis. *South African Medical Journal*, 106(6), 45–46.
<https://doi.org/10.7196/SAMJ.2016.v106i6.10863>
 21. Simbayi, C., Zuma, K., Zungu, N., Moyo, S., Marinda, E., Jooste, S., Mabaso, M., Ramlagan, S., North, A., van Zyl, J., Mohlabane, N., Dietrich, C., Naidoo, I., and the SABSSM V Team. (2019). South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2017. HSRC Press: Cape Town, South Africa.
 22. Statistics South Africa. (2017). Mid-year population estimates 2017. Pretoria: StatsSA.
 23. Humeniuk, R.E., Henry-Edwards, S., Ali, R.L., Poznyak, V., & Monteiro, M. (2010). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): manual for use in primary care. Geneva: World Health Organization.
 24. Babor, T.F., Higgins-Biddle, J.C., Saunders, J.B., & Monteiro, M.G. (2001). AUDIT: The Alcohol Use Disorders Identification Test. Guidelines for use in primary care. Geneva: World Health Organization, Department of Mental Health and Substance Dependence.
 25. Peltzer, K., Davids, A., & Njuho, P. (2011). Alcohol use and problem drinking in South Africa: findings from a national population-based survey. *African Journal of Psychiatry*, 14(1), 30-7. doi: 10.4314/ajpsy.v14i1.65466.
 26. Liskola, J., Haravuori, H., Lindberg, N., Niemelä, S., Karlsson, L., Kiviruuusu, O., & Marttunen, M. (2018). AUDIT and AUDIT-C as screening instruments for alcohol problem use in adolescents. *Drug and alcohol dependence*, 88, 266–273. <https://doi.org/10.1016/j.drugalcdep.2018.04.015>
 27. Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., Walters, E. E., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological medicine*, 32(6), 959–976.
<https://doi.org/10.1017/s0033291702006074>
 28. Peltzer, K., Ramlagan, S., Johnson, B. D., & Phaswana-Mafuya, N. (2010). Illicit drug use and treatment in South Africa: a review. *Substance use & misuse*, 45(13), 2221–2243.
<https://doi.org/10.3109/10826084.2010.481594>

29. Buddy, T. (2020). Common Reasons Why Young Adults Use Marijuana. VeryWellMind. Available at <https://www.verywellmind.com/why-do-young-people-use-marijuana-63525?print> (accessed 18 November 2020).
30. Hartney, E. (2020). How Peer Pressure Influences Addiction. VeryWellMind. Available at <https://www.verywellmind.com/what-is-peer-pressure-22246> (accessed 18 November 2020).
31. Dada, S., Burnhams, N. H., Erasmus, J., Parry, C., Bhana, A., Pretorius, S., Kitshoff, D., & Weimann, R. (2018). South African Community Epidemiology Network on Drug Use (SACENDU) – Phase 43. Available at <https://www.samrc.ac.za/sites/default/files/attachments/2018-11-05/SACENDUFullReportPhase43June2018.pdf> (accessed 19 November 2020).
32. Fergusson, D. M., Horwood, L. J., & Beautrais, A. L. (2003). Cannabis and educational achievement. *Addiction* (Abingdon, England), 98(12), 1681–1692. <https://doi.org/10.1111/j.1360-0443.2003.00573.x>
33. Lynskey, M., & Hall, W. (2000). The effects of adolescent cannabis use on educational attainment: a review. *Addiction*, 95(11), 1621–1630. <https://doi.org/10.1046/j.1360-0443.2000.951116213.x>
34. van Heerden, M. S., Grimsrud, A. T., Seedat, S., Myer, L., Williams, D. R., & Stein, D. J. (2009). Patterns of substance use in South Africa: results from the South African Stress and Health study. *South African Medical Journal*, 99(5 Pt 2), 358–366.
35. Kalichman, S. C., Simbayi, L. C., Jooste, S., Cherry, C., & Cain, D. (2005). Poverty-related stressors and HIV/AIDS transmission risks in two South African communities. *Journal of Urban Health: bulletin of the New York Academy of Medicine*, 82(2), 237–249. <https://doi.org/10.1093/jurban/jti048>
36. Teesson, M., Farrugia, P., Mills, K., Hall, W., & Baillie, A. (2012). Alcohol, tobacco, and prescription drugs: the relationship with illicit drugs in the treatment of substance users. *Substance use & misuse*, 47(8-9), 963–971. <https://doi.org/10.3109/10826084.2012.663283>
37. Kandel, D. B., & Davies, M. (1992). *Progression to regular marijuana involvement: Phenomenology and risk factors for near-daily use*. In M. D. Glantz & R. W. Pickens (Eds.), *Vulnerability to drug abuse* (p. 211–253). American Psychological Association. <https://doi.org/10.1037/10107-009>