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MOTIVATION TO USE CANNABIS AMONG YOUNG ADULTS AT A UNIVERSITY IN BOTSWANA

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ABSTRACT

In low and middle income countries, cannabis use is common and reported to be rising, especially among adolescents and young adults. Data on the motives to use cannabis among this group is lacking. This study aimed to assess the prevalence of and motives for using cannabis among 350 University of Botswana students (48.6% male, n=169). Cannabis use was assessed by the revised Cannabis Use Disorder Identification Test (CUDIT-R) and motives to use cannabis by Marijuana Motives Measure (MMM). Using both univariable and multivariable regression analyses, the prevalence of cannabis use and the extent to which the social and coping motives predicted cannabis use were assessed in the sample A total of 128 (36.6%) students reported using cannabis at least once in the past six months of whom 82 (64.1%) were male students. Among self-reported users, 16.4% (n=21) were problem users (CUDIT-R score ≥13). Both coping (β = 0.56 (95% CI: 0.41, 0.72)) and social (β =0.33 (95% CI: 0.16, 0.51)) motives significantly predicted cannabis use in univariable regression analyses. When adjusted for social motive, coping motive independently and significantly predicted cannabis use for the total sample (β =0.57 (95% CI: 0.38, 0.77)) and for both male (β =0.47 (95% CI: 0.19, 0.73)) and female (β =0.74 (95% CI: 0.52, 0.99)) students while the influence of social motive attenuated and ceased to be insignificant. In young adults, cannabis use is common and motivated by both coping and social reasons, particularly coping motive. Both motives are essential for designing interventions to reduce cannabis use in educational institutions. Such interventions may include better education on drug and substance use and adaptive coping strategies.

Keywords: Cannabis use, social motive, coping motive, university students, Botswana

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INTRODUCTION

Globally, cannabis is the most widely used illicit drug (UNODC, 2015; WHO, 2010), particularly among adolescents and mainstream youth (Degenhardt, Ferrari, Calabria, et al., 2013; Gowing, Ali, Allsop, Marsden, Turf, West, & Witton, 2015; Hall & Degenhardt, 2007). In low and middle income countries, cannabis use is reported to be on the rise (Hall & Degenhardt, 2007). The reasons for the rise in cannabis use in developing countries remain largely unknown. Possible reasons could be the dearth of information on cannabis, the normalization and legalization of the drug in some parts of the world (Sobesky & Gorgens, 2016), and the lack of research on drug and substance use in general (UNODC, 2015; WHO, 2010). Nevertheless, cannabis use remains potentially harmful in both the short and long-term. In the short term, cannabis use is linked to cognitive impairment (e.g., reduced ability to plan, make decisions, maintain attention, and solve problems) and poor school outcomes (Fergusson, Boden & Horwood, 2015). In addition, cannabis use is reported to be a gateway to the abuse of other drugs such as tobacco and alcohol (Kandel & Kandel, 2015). In the long-term, cannabis use, especially with an early onset, is suggested to disrupt normal brain development particularly neurological development and associated with reduced regional brain volume (Filbey, Aslan, Calhoun, et al., 2014; Lubman, Cheetham, & Yucel, 2015). Similarly, long-term cannabis use has also been associated with reduced motivation for goal directed behaviour such as poor concentration, inability to follow routines, and to master new materials (Lubman, Cheetham, & Yucel, 2015; Volkow, Swanson, Evins, et al., 2016), chronic psychotic states (e.g., hearing voices, delusions and erratic behaviour) and violent behaviours (Volkow, Swanson, Evins, et al., 2016; Dugré, Dellazizzo, Giguère, Potvin, & Dumais, 2017; Fergusson, Boden & Horwood, 2015).

Particularly for the youth, cannabis use is often associated with accidents (Fergusson, Boden & Horwood, 2015), other drug use such as tobacco and alcohol (Kandel & Kandel, 2015), crime (Carney, Myers, Kline, Johnson, & Wechsberg, 2017), risky sexual activities (Parry, Carney, & Petersen Williams, 2017), and can potentially lead to dropping out of college due to truancy, poor academic outcomes, and reduced motivation (Lac & Luk, 2017; Volkow, Swanson, Evins, et al., 2016). Furthermore, cannabis use is also associated with a numerous mental health problems such as depression and anxiety (Danielsson, Lundin, Agardh, Allebeck, & Forsell, 2016; Horwood, Fergusson, Coffey, Patton, Tait, Smart, et al., 2012) and cognitive processes such as inability to think clearly, organize thoughts, and poor memory (Iversen, 2012; Filbey, Aslan, Calhoun, et al., 2014), all of which are critical for educational success.

Although cannabis use has been widely studied in the Western world, research on cannabis in developing countries such as Botswana is lacking (UNODC, 2015; WHO, 2010). Moreover, the studies that have been conducted in countries such as Botswana have mainly been epidemiological with associated personality and mental health problems (Ludick & Amone-P'Olak, 2015; Spriggens & Hides, 2015). Yet, knowledge on what motivates the youth to use cannabis is lacking**.** The current study will focus not only on the prevalence but also the motivation to use

cannabis among young adults, a subpopulation where cannabis use is more common (Johnston, O'Malley, & Bachman, 2015) and associated with adverse future health and social consequences. Knowledge on what motivates adolescents and the youth to use cannabis can provide clues for developing effective interventions to prevent the onset and continued use of cannabis and to identify vulnerable youth.

Theoretical framework

Adapted from the Drinking Motives Measure, Cooper (1994) developed Marijuana Motives Measure (MMM) to predict cannabis use among college students based on a 5-factor model: enhancement motives, conformity motives, expansion motives, coping motives, and social motives (Benschop, Liebregts, van der Pol, Schaap, Buisman, van Laar, ... & Korf, 2015; Cooper, 1994; Simons, Correia, Carey, & Borsari, 1998). The model posits that individuals are motivated to use cannabis for different needs and reasons (Figure 1). Some use it to enhance their social status (e.g., lower anxiety), to conform to their subculture (e.g., peer pressure), cope with problems (e.g., to reduce stress) or for social reasons (e.g., leisure or having fun). The motives are useful in helping to understand when, where and how frequently cannabis is used and behaviours associated with its use (Benschop, Liebregts, van der Pol, Schaap, Buisman, van Laar, ... & Korf, 2015; Cooper, 1994; Simons, Correia, Carey, & Borsari, 1998).

Particularly for this study, two motives related to cannabis use will be assessed: coping and social motives. Previous studies suggested that only the coping and social motives had strong internal consistency (Zvolensky, Vujanovic, Bernstein, et al., 2007). These two motives were chosen for two reasons. First, students experiencing various stressful life events such as heavy academic workload, rejection by peers, poor relations with parents, peers, and lecturers are more likely to resort to cannabis use to cope with life stressors (Hetolang & Amone-P'Olak, 2017). Second, other students may indulge in cannabis use for social enhancement such as to have fun with friends (Benschop, Liebregts, van der Pol, Schaap, Buisman, van Laar, ... & Korf, 2015; Lee, Neighbors, & Woods, 2007). Furthermore, cannabis use is reported to be more common among males than females (Cooper & Haney, 2014; Ludick & Amone-P'Olak, 2015; Moitlakgola & Amone-P'Olak, 2015). However, female cannabis users are reported to progress faster to cannabis use disorder and associated clinical problems after onset than their male counterparts (Cooper & Haney, 2014). Nevertheless, it is unclear whether females use cannabis for the same reasons as males. For this reason, it is imperative to study whether

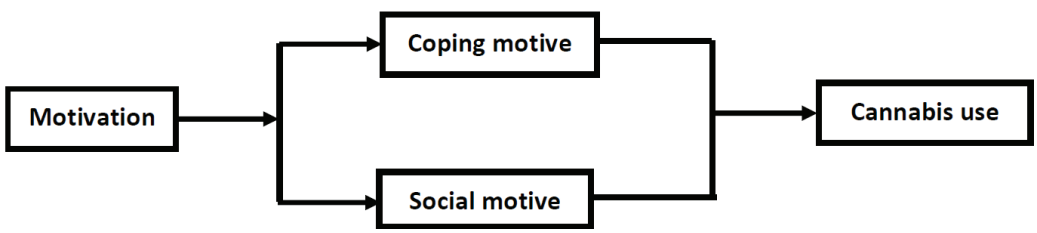

Figure 1. Theoretical model of social and coping motives to use marijuana.

motivations to use cannabis differ with gender.

The objectives of this study were threefold: a) to assess the prevalence of cannabis use, b) to assess the motivation for using cannabis, and c) to examine whether the motivation for using cannabis differ among male and female students.

METHOD

Design and population

The design used in the current study was cross-sectional with participants selected using a convenient sampling strategy. Based on teaching timetables for each faculty, classes were randomly selected and permission sought from the respective lecturers to collect data from students during their lecture hours across all the eight faculties within the University of Botswana. Altogether, data were collected from 373 students registered for different undergraduate degree programmes in the eight faculties. A total of 23 questionnaires were discarded due to incomplete data.

Data collection procedure

Data was gathered from classrooms and lecture theatres in eight faculties of the university, namely, Social Sciences, Engineering and Technology, Humanities, Business, Health Sciences, Medicine, Science, and Education. In the different classes, the students were given information about the research purpose, their rights to decline to participate or withdraw at will during participation, and that information gathered from them would be treated with utmost confidentiality prior to seeking consent. Subsequently, the students signed a consent form before taking part in the study. Furthermore, the students were instructed not to put any identifying information on the questionnaire. The questionnaire took about 10 minutes to complete.

Measures

In this study, three different measures were used: (i) self-developed measure to assess socio-demographic characteristics (e.g., age, gender, place of upbringing, parental educational attainment, etc.), (ii) Cannabis Use Disorder Identification Test-Revised - CUDIT-R (Adamson et al., 2010) to assess cannabis use, and (iii) Marijuana Motives Measure - MMM (Chabrol et al., 2005) to measure motivation to use cannabis.

Socio-demographic characteristics: participants were asked to report their gender, age, faculty enrolled in, year of study, secondary school attended, place of upbringing, and the educational attainment of the mother or female guardian and father or male guardian.

Revised Cannabis Use Disorder Identification Test - CUDIT-R (Adamson et al., 2010): The revised 8-item CUDIT–R scale was used to assess severity of use and problematic cannabis-behaviors. The CUDIT-R contains items relating to consumption, dependence, cannabis-related problems and psychological issues. Scores can range from 0 to 32 with 91.3% of participants with a recognized cannabis use disorder scoring above 13 (Adamson et al., 2010). The psychometric properties are adequate with high internal consistency ranging from .72 to .92 and high sensitivity (91%) and specificity (90%) (Adamson et al., 2010). Moreover, the CUDIT–R scale is brief and easy to administer with only 8 items assessing cannabis use in the

past six months. Some of the items include: "How often do you use cannabis?" or "How often during the past 6 months have you had a feeling of guilt or remorse after using cannabis?" Responses for these questions were categorized as "never" = 0 through to "daily or almost daily" =4. In this study, the Cronbach alpha for the CUDIT-R was α=.78.

Marijuana Motives Measure - MMM (*Chabrol et al., 2005*): The MMM is a measure to assess the motives for using cannabis: social motive (e.g., to enjoy a party) and coping motive (e.g., forget my worries). Participants indicate on a 5- point Likert-scale their reasons for using cannabis. The MMM subscales have demonstrated excellent internal consistency (Chabrol et al., 2005). For the purpose of the current study, only the coping (4 items, e.g., "To forget about my problems") and social (6 items, e.g., "Because it makes social gatherings more fun") subscales of the MMM were used. In this study, the Cronbach alpha for the two scales were .92 and .89 for social and coping motives, respectively. The two factors fitted the factor structure in MMM (Chabrol et al., 2005) involving coping motive (4 items; 0.83) and social motive (6 items; 0.81), both indicative of s strong internal consistency.

Data analyses

Descriptive statistics (mean, standard deviation and range) were used to compute socio-demographic characteristics of study participants and the prevalence of cannabis use in the total group and the different genders. Sub-population differences (e.g., gender differences on prevalence and motives for using cannabis) were assessed using t-test. To ensure that both motivation variables in the regression models were comparable, they were standardized to a mean of zero and SD of 1 (*Z* scores). Next, univariable regression analyses were used to assess the extent to which coping and social motives predicted cannabis use and the results stratified by gender. To obtain unique effects of each motive on cannabis use, the shared variance between coping and social motives were adjusted for each other in multivariable regression analyses. Previous studies indicate that the use of cannabis is sex-specific, with women reporting less cannabis use than their male counterparts (Cooper & Haney, 2014; Ludick & Amone-P'Olak, 2015; Moitlakgola & Amone-P'Olak, 2015). All the statistical analyses were carried out using IBM SPSS statistical software, version 24.0. (IBM Corp. Released 2016). Associations with a *p* value less than 0.05 were considered statistically significant.

RESULTS

Demographic characteristics and prevalence of cannabis use

The demographic characteristics of the study participants are presented in Table 1. Altogether, 350 (females =51.4%, n=191) students aged 21.73 (SD, 2.49) participated in the study. A total of 128 participants, representing 36.6% of the total sample reported using cannabis at least once in the past six months. Of these, 82 (64.1%) were male students. The proportion of cannabis problem users was 16.4% (n=21). Gender differences were observed for age, cannabis use in the past six months, and problem use of cannabis. Overall, male students were older, used more cannabis in the past six

months, and were more problem users than their female counterparts (Table 1).

The influence of social and coping motives on cannabis use

The results of univariable regression analyses to assess the extent to which motivation predicted cannabis use are presented in Table 2. Both coping and social motives significantly predicted cannabis use in univariable regression models for all students and also for both male and female students. The proportion of explained variance for the model ranged from $\mathbf{R}^2 = 0.31$ ($F_{2, 348} = 52.18$, $p < .001$) for coping motive to $\mathbf{R}^2 = 0.10$ ($F_{2, 348} = 14.14$, $p < .001$) for social motive. The proportion of explained variance for coping motive was larger ($\mathbf{R}^2 = 0.31$) than for social motive ($\mathbf{R}^2 = 0.10$).

The independent effects of coping and social motives on cannabis use after adjusting for each other

The multivariable regression analysis was fitted to assess whether the influence

Table 1. Descriptive characteristics and gender differences of the variables in the study

Variable name	Total (*N*=350)	Male (*n*=169)	Female (*n*=181)	
	M (*SD*)	M (*SD*)	M (*SD*)	*t*-test, *p* value
Age	21.01 (2.36)	21.94 (2.43)	20.07 (2.33)	**2.08, $p < 0.05$**
Coping motive	7.56 (4.39)	7.88 (4.35)	6.98 (4.44)	1.07, $p > 0.05$
Social motive	12.00 (6.43)	12.85 (6.53)	10.44 (6.00)	**2.53, $p < 0.05$**
	N (%)	N (%)	N (%)	
Participants				
Year 1	115 (32.9)	44 (38.3)	71 (61.7)	
Year 2	104 (29.7)	59 (56.7)	45 (43.3)	
Year 3	49 (14.0)	25 (51.0)	24 (49.0)	
Year 4	71 (20.3)	35 (49.3)	36 (50.7)	
Year 5	11 (3.1)	7 (63.6)	4 (36.4)	
Used cannabis in the past six months				**4.53, $p < .05$**
Yes	128 (36.6)	82 (64.1)	46 (35.9)	
No	222 (63.4)	87 (39.2)	135 (60.8)	
Problem use of cannabis				
CUDIT-R score < 13	107 (83.6)	70 (67.3)	37 (32.7)	
CUDIT-R score ≥ 13	21 (16.4)	14 (66.7)	7 (33.3)	

Key: M=mean, SD=Standard deviation, min=minimum score, max=maximum score

Table 2. Univariable regression of cannabis use on coping and social motives stratified by gender

	Total		Male		Female	
Variables	**β (95% CI:)**	**Adjusted R^2**	**β (95% CI:)**	**Adjusted R^2**	**β (95% CI:)**	**Adjusted R^2**
† Coping motive	0.56 (0.41, 0.72)	0.31	0.41 (0.19, 0.61)	0.16	0.80 (0.63, 0.99)	0.64
† Social motive	0.33 (0.16, 0.51)	0.10	0.21 (0.10, 0.42)	0.05	0.52 (0.27, 0.89)	0.25

Key: β= standardised beta; CI= Confidence Interval. † Results are adjusted for age.

of coping and social motives on using cannabis are independent of each other (Table 3). When both the social and the coping motives were simultaneously entered in the same model, the coping motive uniquely and independently predicted cannabis use while the effects of social motive fizzled out and remained insignificant for both male and female students (Table 3). By including both motives in the model, the proportion of explained variance for the model in which both the coping and social motives of cannabis use were entered were: $\mathbf{R}^2$ = 0.30 ($\boldsymbol{F}_{3, 347}$ = 25.97, $p < .001$) for the total number of participants, $\mathbf{R}^2$ = 0.15 ($\boldsymbol{F}_{3, 347}$ = 7.61, $p < .001$) for male students, and $\mathbf{R}^2$ = 0.64 ($\boldsymbol{F}_{3,347}$ = 36.42, $p < .001$) for female students. The proportion of explained variance for coping motive was larger for female students ($\mathbf{R}^2$ = 0.64) than for male students ($\mathbf{R}^2$ = 0.15).

DISCUSSION

Recap of main findings

This study assessed not only the prevalence of problem use of cannabis but also the motives for using cannabis among young adults at the University of Botswana. This is the first study in Botswana that considered the motives for using cannabis among young people. Particularly, the objectives of the current study were to: a) assess the prevalence of cannabis problem use, b) assess the motives for using cannabis, and c) assess whether there were any gender differences in the motives for using cannabis among university students. The results showed that slightly over a third of students have used cannabis in the past six months and six per cent (6%, n=21/350) of the students in the sample categorized as problem users. The majority of the students who use cannabis in the past six months were male students. Both the coping and social motives predicted cannabis use with the effects of coping motive notably stronger on cannabis use than the social motive. This was clearly evident when both the social and coping motives were simultaneously entered together in a multivariable model, the effect of the social motive attenuated and was no longer significant in both male and female students.

Agreement with previous studies

The findings of the current study that cannabis use is more prevalent among male than female students agrees with previous findings in the same population (Moitlakgola & Amone-P'Olak, 2015; Ludick & Amone-P'Olak, 2015) and elsewhere (Degenhardt, Chiu, Sampson, et

Table 3. Multivariable regression of cannabis use on constructs of coping and social motives stratified by gender

	Total		Male		Female	
Variables	**β (95% CI:)**	**Adjusted R^2 = 0.30**	**β (95% CI:)**	**Adjusted R^2 = 0.15**	**β (95% CI:)**	**Adjusted R^2 = 0.64**
†Coping motive	0.57 (0.38, 0.77)		0.47 (0.19, 0.73)		0.74 (0.52, 0.99)	
††Social motive	-0.02 (-0.03, 0.03)		-0.09 (-0.06, 0.03)		0.12 (-0.12, 0.39)	

Key: β= standardised beta; CI= Confidence Interval. †Adjusted for age and social motive. †† Adjusted for age and coping motive

al., 2008; Degenhardt, Ferrari, Calabria, et al., 2013; Gowing, Ali, Allsop, Marsden, Turf, West, & Witton, 2015). Furthermore, there were significant differences in cannabis use among male and female students. Male students did not only use cannabis more frequently but were more problem users than their female counterparts. The sex differences in the findings on prevalence and problem use also agree with previous reports (Crane, Langenecker, & Mermelstein, 2015; Moitlakgola & Amone-P'Olak, 2015; Ludick & Amone-P'Olak, 2015). Although gender differences in cannabis use still exist, the global trend shows a convergence of the gender gap in cannabis use (Degenhardt, Chiu, Sampson, et al., 2008) as cannabis use becomes more acceptable, perhaps due to normalization and legalization of use in other parts of the world (Sobesky & Gorgens, 2016).

The roles of the coping and social motives in predicting cannabis use also agree with previous findings (Benschop, Liebregts, van der Pol, et al., 2015; Moitra, Christopher, Anderson, & Stein, 2015). It is possible that students use cannabis as a maladaptive strategy to cope with numerous life stressors and psychological distress. Indeed, previous studies with the same population have indicated that the students experience several stressful life events such as poor relations with peers, parents and lecturers which have been linked to depression and alcohol abuse (Hetolang & Amone-P'Olak, 2017; Ludick & Amone-P'Olak, 2015; Moitlakgola & Amone-P'Olak, 2015). Similarly, past studies with the same population and elsewhere have also linked poor self-control (Morutwa & Plattner, 2014), novelty seeking (Ludick & Amone-P'Olak, 2015), and impulsiveness (Pokhrel, Sussman, & Stacy, 2014) with drug and substance abuse. Indeed, it is widely recognized that mental health problems such as depression and anxiety are related to cannabis use (Danielsson, Lundin, Agardh, Allebeck, & Forsell, 2016; Gage, Hickman, Heron, et al., 2015). Consequently, in order to cope with the stressors and mental health problems, it is possible that students resort to maladaptive strategies such as using cannabis to cope.

The findings in this study goes to highlight the importance of the motivation model which stipulates that young adults are motivated by different needs and reasons for using cannabis. The current study demonstrates that students often use cannabis for both social (e.g., for leisure and having fun) and coping (e.g., to reduce stress or cope with anxiety, poor self-control, or depression) motives (Benschop, Liebregts, van der Pol, Schaap, Buisman, van Laar, ... & Korf, 2015; Cooper, 1994; Simons, Correia, Carey, & Borsari, 1998). It remains unclear why the effects of the social motive fizzled out in a multivariable regression analysis. It is possible that the same students who use cannabis for coping are the very ones who use it for social motives too. In addition, it could be that the same students who use cannabis to cope are also experiencing social challenges and therefore use cannabis as a crutch to navigate through social activities as well.

The results of this study has important implications for research, policy and practice. Regarding research, a longitudinal research design that aims to chart the trajectory of drug and substance use from earlier on in life while taking into account individual, family, and community contextual risk and protective factors is recommended. Policies that not only reduces

the supply but also tackle the demand side of drug and substance abuse are critical in addressing the drug and substance abuse problems among young people. At different institutions of learning, it is important to design interventions to identify the youth who are likely to abuse drugs and substance and enhance protection of the youth against drug and substance abuse. Interventions to reduce drug and substance use should target students with mental health problems by teaching them more adaptive coping strategies and social activities (e.g., having fun) without resorting to drug and substance use.

Limitations

Several factors that may limit validity need to be considered when interpreting the findings of this study. First, the self-report measure used in this study might have led to under-reporting of cannabis use. Nevertheless, there were significant variations between cannabis and non-cannabis users. Second, the convenient sampling strategy employed in the study may limit generalizability of the results beyond the setting. Nonetheless, the results of this study agree with previous findings among young adults in colleges and universities. Third, the cross-sectional design does not infer causality. The above limitations notwithstanding, the findings in this study may be a precursor to a future longitudinal study to comprehensively assess the trajectory, motivation, inter- and intrapersonal factors, and contextual risk and protective factors associated with cannabis use among young adults.

Conclusion

This study of young adults shows that cannabis use is common, especially among male students and is associated with both coping and social motives. However, the effects of coping motive on cannabis use was markedly stronger than social motive. Sex differences were only observed in the prevalence and disordered use of cannabis other than the motives. Policies and interventions to reduce cannabis use need to consider motives for using cannabis as an important factor. This signifies that the social and coping motive probably contributes to the risk of using cannabis in young adults and should be considered by policy makers, practitioners and intervention designers.

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Conflict of interest: None

Authors' contributions

MBK and KAP designed the study and MBK implemented the survey. MBK had the original idea for the manuscript, conducted the analyses, and wrote the manuscript. All authors provide input into interpreting results, critically revised the manuscript for important intellectual content and approved the final version of the manuscript.

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