

Cannabis and College Students in British Columbia: Attitudes, Patterns of Consumption and Perception of Harm

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ABSTRACT

Recreational use of cannabis in Canada has recently been legalized. Previous studies indicate long-term neurocognitive and cognitive sensitivity of the adolescent brain to cannabis. The present study investigates cannabis consumption among college students, including their reasons for consumption and their perceptions of its effects on their health and social functions, including learning. An online, anonymous, voluntary survey was given to students at a community college in Vancouver. Of the 320 students surveyed, 71% had consumed cannabis, 44% within the last week. A significant portion perceived harmful short-term effects (ranging from paranoia to inability to focus) and long-term impacts (ranging from decline in lung function to loss of memory). Students reported therapeutic effects such as alleviation of stress and anxiety and improved sociability. More than half reported a mix of beneficial and harmful impacts or no impacts. The reasons for consuming cannabis were recreational (52%), recreational and therapeutic (37%), and purely therapeutic (6%). Forty-three per cent (43%) consumed cannabis for therapeutic reasons including insomnia, anxiety, pain and nausea as top reasons. A significant portion of student consumers of cannabis reported harmful effects that are consistent with previous studies using objective measures. Students consume cannabis for both recreational and therapeutic reasons, even while experiencing harmful short and long-term effects. National cannabis policy, currently being revised in Canada to legalize recreational consumption, should include public education aimed at young adults.

Key words: cannabis, students, drug use, marijuana

Globally, *Cannabis sativa* is the most commonly used illicit drug (United Nations, 2008). In British Columbia, Canada, rates of cannabis consumption are higher than in other parts of Canada (Stockwell, Sturge, Jones, Fischer & Carter, 2006; Health Canada, 2011). Metropolitan Vancouver, British Columbia's largest urban area, has a history of permissive social attitudes concerning recreational consumption of cannabis dating back to at least the 1960s. The nearby American states of Washington, Oregon, California, and Colorado

have recently legalized cannabis consumption by adults. As of 2013, Health Canada has enabled cannabis production, distribution and medical use under a physician's prescription (Health Canada, n.d.) and recreational cannabis use was legalized in October of 2017. Attitudes within the medical and legal spheres are changing as cannabis becomes more easily available in British Columbia and other Canadian jurisdictions.

The average age of initiation to cannabis consumption in Canada is 15.6 years (Health Canada, 2011), indicating that secondary school

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and post-secondary students are among consumers. In a longitudinal study in the Canadian province of Ontario, 21.3% of high-school students self-reported cannabis consumption and 37% of grade 12 students reported using cannabis within the past year (Boak, Hamilton, Adlaf & Mann, 2013). Other data from this study showed about 2% reporting daily consumption (Crepault, Rehm, & Fischer, 2016). While societal acceptance of cannabis use may be changing, studies on the effects of cannabis on adolescents and young adults are raising concerns. These studies have suggested an increased risk of neurological alterations (Shollenbarger, Price, Wieser & Lisdahl, 2015) which may manifest as acute or non-acute neurocognitive and memory deficits (Ragnanathan & D'Souza, 2006) and may include effects key to learning processes (Crane, Schuster, Fusar-Poli & Gonzalez, 2013). Recent studies in this area have been strengthened by the use of placebo-controlled lab experiments as well as investigations into THC dose-effect relationships (D'Souza et al., 2012). More recent results are consistent with earlier observations that THC can acutely impair episodic memory, including immediate and delayed recall, procedural memory, and associative learning and memory. These effects have been found both among occasional and regular cannabis users in comparison to non-users (Volkow et al., 2016).

The present study explores the attitudes about cannabis, patterns of consumption, as well as perceived effects of cannabis, among college students in central Vancouver, Canada. The objective of the study is to contribute insights about consumption among young adults to the current policy development process, as well as to inform public health institutions and educators.

METHOD

Participants

Of 320 respondents, 177 (55.31%) were female, 132 (41.25%) were male, and 11 (3.44%) identified as transgender or "other". The average age of the respondents was 22.95 years old, 73% of whom were born in Canada, 96% were students and 46% lived with their parents.

Procedures

This study involved the collection of data through the use of Lime Survey, an open source on-line survey application. The survey was voluntary and anonymous and made available on the campus for students to complete. Respondents could complete the survey through any computer or device with internet access. Data was collected over a 15-month period between September 30th, 2014 and December 1st, 2015. Three hundred and twenty-one students participated. As this research involved human subjects, approval was sought and received by the Research Ethics Board of the college.

Study Variables

The survey was created specifically for this study and is non-standardized. However, study variables were based on a review of existing literature on cannabis, youth, learning, and mental health. Variables were organized to gather responses in the following areas:

Demographic background. Participants were asked about age, gender identity, ethnicity, sexual orientation, living situation, financial situation, and relationship status.

Cannabis use habits. Questions included whether respondents used cannabis, frequency of use, source of cannabis, form of cannabis used, method of use, and reasons for use.

Attitudes towards cannabis use in society. Participants were asked about their opinions regarding legalization of cannabis, perceived dangerousness of cannabis, and attitudes about youth using cannabis,

Perceived effects of cannabis on personal physical, mental, and social functioning. Respondents were asked how they felt after using cannabis, and how they felt the day after using, as well as how they felt about the amount of cannabis they used. They were asked about the positive and negative impacts of cannabis use on physical well being, on ability to manage work and school-related tasks, impacts on social life and friendships, impacts on home life, impacts on mental health, and impacts on intimate relationships. Drawing on the Kessler Psychological Distress scale (Kessler & Andrews, 2002), respondents were asked about mental health symptoms related to depression, and

anxiety. Drawing on the Rand 36-item short form survey, students were asked about their physical health status (Ware & Sherbourne, 1992). For each of these, participants were asked if they felt that cannabis had positive or negative impact in these areas, and then were provided the opportunity to describe these impacts.

Perceived effects on learning ability and performance. Participants were asked whether, and in what ways cannabis use impacted school and work, whether they experienced learning problems associated with cannabis use, and ability to focus on school the day after using cannabis.

In order to achieve the most comprehensive findings possible, both fixed and open-ended questions were used in the survey. Respondents were given opportunities to provide qualitative information in addition to answering the fixed response survey questions.

Sampling

Sampling was purposeful; only college students were recruited for the study (total student population of approximately 10,000). Researchers were involved in the recruitment of students and were assisted by faculty members and students. Leaflets with information about the study and a link to the questionnaire were distributed in the common areas of the college by faculty and students. These areas included the cafeteria, student seating areas, and the Student Union Building. Posters were displayed throughout the college and on the researcher's office doors and included a QR code for easy access to the survey. Classrooms were also visited by faculty and student assistants to recruit students in person.

Data Analysis

Frequencies were calculated on all variables to provide a descriptive representation of the students included in the study. Cross tabulations were utilized to examine the relationship between key variables as identified by the literature. The qualitative analysis plan for this study employed a general approach to qualitative data analysis as articulated by Maxwell (2005). Responses were grouped into categories (i.e. different types of positive effects on mental health) and

representative quotes were selected for inclusion in this report. All data management and analysis were conducted using Lime Survey, Excel and SPSS.

Limitations of Dataset

The data set consists of only the students who voluntarily participated in the study. There is no data available on the attitudes and use of cannabis for students who did not participate, therefore the present findings cannot be generalized to the entire student population of the college.

RESULTS

With respect to having ever consumed cannabis, 73% reported having ever used cannabis, with 36% of those who had used cannabis reporting that they had used it within the last month (see Table 1). Of those who reported that they were currently cannabis consumers, 23% were daily users. Another 28% of current users (28/154) reported using it once a week or more.

Reasons for Cannabis Use

A subset of 112 cannabis users reported on the reasons for using it. Of these, 52% (58/112) reported doing so solely for recreational purposes, while 37% (41/112) did so for both recreational and therapeutic purposes. Another 6% (7/112) consumed cannabis purely to address physical (2%) or mental health issues (4%).

Participants reported that sleeplessness was the most common health condition for which they used cannabis followed by anxiety, pain, and nausea (see Table 1; respondents could report more than one condition).

Although depression and Attention Deficit Hyperactivity Syndrome (ADHD) were not options in the survey, several respondents added these as other conditions for which they take cannabis.

Perceived Short-Term Effects of Cannabis

Students reported a range of short-term effects of cannabis consumption: 55% felt happy, relaxed, lively and talkative, 17% reported relief

Table 1. *Summary of Cannabis Use and Reasons for Use*

How long has it been since you last used cannabis? (N= 194)	Percentage (and frequency) of responses
Less than 1 hour	9.79% (19)
Less than 1 day	17.53% (34)
Less than 1 week	16.49% (32)
Less than 1 month	17.01% (33)
Less than 1 year	21.13% (41)
More than 1 year	18.04% (35)
How often do you use cannabis? (N= 154)	Percentage (and frequency) of responses
Daily	23.87% (37)
Weekly	18.06% (28)
Monthly	23.87% (37)
Other	33.55% (52)
What are your reasons for using cannabis? (N= 148)	Percentage (and frequency) of responses
Medicinal purposes - Physical health concern	2.02% (3)
Medicinal purposes - Mental health concern	4.05% (6)
Recreational Use	48% (71)
Both medicinal and recreational use	36% (54)
Social pressure	4.05% (6)
Other	5.40% (8)
What health conditions are you using cannabis to treat? (N= 112) *Respondents could report more than one health condition	Percentage (and frequency) of responses
Sleeplessness	29.38% (94)
Anxiety	24.68% (78)
Pain	18.75% (60)
Nausea	13.13% (42)

from aches and pains, and 12.5% were quiet and unsociable. With respect to negative effects, 8.5% reported paranoia and 2% experienced hallucinations. When asked specifically about their perception of the effects on mental acuity on the day after cannabis consumption, 51% reported no effects, 34% reported a degree of “foggy mindedness”, and 13% reported feeling sharp-minded. Further data was collected with respect to the short-term effects of cannabis consumption on school and learning: 54% reported no effect on their focus at school, 26% reported difficulty focusing at school, and 20% reported being focused at school. With respect to the ability to manage work or school, 62% reported no effect, 14% reported that it has both harmed and improved it, 13% reported an improvement, and 11% reported that it had a negative effect.

Perceived Longer-Term Impacts of Cannabis Use

Participants answered questions about their perceptions of cannabis use on their physical and mental health, social well-being, and school and work.

Perceived Effects on Physical Well-Being and Health

Of those responding to the question about physical well-being, 56% reported that there were no effects, 32% reported both harm and improvement, 18% thought that their physical well-being was improved by using cannabis, and 7% reported it had harmed them (see Table 2). Although only 7% of participants reported that cannabis had been harmful to their physical

Table 2. *Summary of Self-Perceived Effects of Cannabis Use*

Effects of Cannabis Consumption on Physical Health (N = 170)	Percentage (and frequency) of responses
It has improved it	2.01% (31)
It has harmed it	4.03% (12)
It has both improved and harmed it	48% (32)
It has had no impact	56% (95)
Effects of Cannabis Consumption on Mental Health (N = 162)	Percentage (and frequency) of responses
It has improved it	18% (49)
It has harmed it	7% (13)
It has both improved and harmed it	19% (27)
It has had no impact	56% (73)
Mental State the Day After Cannabis Consumption (N = 174)	Percentage (and frequency) of responses
Highly focused on school	5.74% (10)
Somewhat focused on school	13.79% (24)
No effect	55.18% (96)
Somewhat difficult to focus on school	16.67% (29)
Difficult to focus on school	8.62% (15)
Has cannabis use impacted your ability to manage work or school? (N = 167)	Percentage (and frequency) of responses
It has improved it	12.57% (21)
It has harmed it	10.77% (18)
It has both improved and harmed it	48.14.38% (24)
It has had no impact	62.28% (104)

health, an additional 18% reported a mix of both harmful and helpful effects. Some participants reported reduction of lung function; a few mentioned that using cannabis prompted them to smoke tobacco. Comments with respect to lung function included:

“I get coughs and chest and throat irritation due to smoking cannabis. I'm experimenting with using oils and vaporizers but have yet to see if alternate methods make a big difference.”

“I feel that my lung capacity has decreased, and I have a chronic cough.”

Other negative physical effects included weight gain:

“Sometimes after I use cannabis, I end up eating too much or eating really unhealthy foods that I wouldn't normally consume.”

“The only way it has been detrimental to my physical well-being is by making me eat a lot

and I have gained weight because of my weed consumption.”

When asked to specify how cannabis had improved their physical well-being, participants listed a range of positive effects. These include pain management:

“...helps with migraines that do not respond to traditional treatments.”

“Physically, it has relieved aches and pains associated with injury.”

“I have chronic pain from a motor vehicle accident and cannabis helps that pain be less. It also helps to take tension out of my neck and back when I'm stressed.”

Some participants listed the relief of menstrual pain:

“I get very painful cramps from my period and cannabis is the best alternative; I've tried advil/pain medication which was making me sick from taking too much.”

Others mentioned the use of cannabis to improve appetite, decrease nausea, and treat anorexia:

“I cannot eat properly without using cannabis and become even more underweight.”

“I sometimes have periods where I have no appetite and everything I eat makes me feel sick, so smoking weed helps me be able to eat without feeling nauseated.”

“It has helped me get back to a normal weight in recovery from anorexia.”

Several mentioned that cannabis use helps them exercise more effectively:

“Before heading to the gym, I'd eat a brownie to stay more focused on the specific workouts. I'd do each set with less mistakes because I'm concentrating on my body.”

“I like to go for walks sometimes after I use cannabis, which counts as exercise.”

“I go to the gym while 'high' and it can improve my workouts (more focus/workout longer)”

Perceived Effects on Mental Health

When asked, “How has cannabis affected your mental health?”, 45% reported no impact. 30% reported improvements to mental health 17% reported both harm and benefit, and 8% of participants reported harm to their mental health. Commentary referred to feelings of paranoia and anxiety:

“I get very paranoid, in my head too much, unable to take control of my thoughts.”

“It has made me a little paranoid, a little scatterbrained at times, and for a year or so after I quit smoking large quantities of weed I felt an impact on my long-term and short-term memory.”

“Depression and anxiety worsened.”

Others wrote about the benefits of cannabis use to their mental health:

“I have struggled most of my life with chronic depression and anxiety and coupled with counselling it has helped greatly with stress management and reducing self-harm.”

“It has helped me to relax and get to sleep many times which is part of self-care which helps improve mental health.”

“I have a lot of anxiety and OCD. Cannabis helps me forget what I was worrying about and helps me relax when I'm stressed out.”

“I feel less depressed and anxious when I smoke weed.”

Perceived Effects on Learning, School and Work

There were a number of comments on a general lack of motivation or laziness associated with cannabis use:

“I am unproductive immediately following and the day after use”

“I had a hard time concentrating and memorizing things at school. I felt very unmotivated at school and at work”.

The majority of respondents (62%) reported no impact of cannabis on work or school, 14% thought cannabis had both positive and negative effects, while 13% reported that cannabis led to benefits, and 11% reported that it had caused harm. Positive effects reported by participants included improved focus:

“Cannabis is stimulating for me so it gives me a boost and I'm able to concentrate and focus.”

“I'm more focused now than I was before; I don't get as distracted anymore.”

“Without cannabis I am unable to remain seated, let alone focused, while doing my school work.”

Stress reduction was also mentioned as a benefit:

“It relaxes me when I am anxious and I believe that once I started smoking, the relaxing effects have helped me calm down and be less stressed out which in turn has improved my marks.”

“It relaxes me so I don't break down from parental pressure.”

“Emotionally I feel more able to pursue an education. Socially, I am not anxious about going and having to interact with others.”

Social Aspects and Perceived Social Impacts

With respect to the social pattern of consumption, 76.5% of cannabis consumers reported doing so with friends, partners or family members, while 23.5% reported consuming it alone.

Those who self-identified as consumers of cannabis were asked of their perception of the amount they consumed. In response, 78% of participants stated that the amount of cannabis they use is “just the right amount”, 12% reported

not using enough, while 10% reported using too much. It was also of interest to note that 16% reported that they felt the cannabis they used was too strong.

The majority of participants (67%) reported a mix of harmful and helpful benefits, or no impact on social life. 30% of participants reported that cannabis had improved their social life, while 3% report that it has harmed their social life. Comments about negative effects include concerns about being antisocial:

“Smoking a lot of cannabis in the times of life where I smoked daily and close to a gram a day, I would withdraw completely from friends. Too paranoid to meet up, cancel plans and not care too much about maintaining friendships, which for women is sacrilege, but yeah, it happened.”

“Too stoned to call, text, or care about seeing people.”

Others spoke about how cannabis use distanced them from friends who do not use cannabis:

“Some friends do not agree with the use of cannabis for recreational and/or medicinal purposes.”

“Some friends disapproved and distanced themselves from me.”

“Pretty much separated me from all my friends that don't blaze.”

For some respondents, cannabis use was associated with substance dependence:

“It led to some friends getting other addictions.”

“Previous partner was dependent on cannabis use, created a problem between us.”

“Along with smoking, I started to drink, and the friends I was spending my time with were encouraging me to drink, which led to me skipping class so I could spend time with them.”

Comments about positive effects included increased bonding with friends:

“I feel more deeply engaged and connected.”

“It is a social drug. Much like alcohol, it creates bonds within a social group. Many of my friends and co-workers smoke on the weekends. These social hangouts are an excellent way of learning more about their interests and personalities.”

“My best friend and I smoke together. It allows us to discuss very interesting topics and we bond over it.”

Others spoke about reducing social anxiety: “It has allowed me to relax in new social situations. I have anxiety in large crowds and it has allowed me to participate in events I would otherwise avoid.”

“I become more talkative during the use of cannabis. I become more comfortable talking to strange people during the use of cannabis.”

“I was less anxious, so it was easier to make friends.”

Some spoke about expanded perspectives that they associate with their cannabis use:

“My cannabis use has makes me more open-minded and empathetic, and able to see things from different perspectives if I am having a conflict with somebody especially when I am "high" and am thinking about situations.”

“Before I started using cannabis, I found myself becoming short tempered with matters that were stupid and mindless. I have always had friends and have been in the "cool" group, but after the use of cannabis I found myself being more sociable and not concerning myself with mindless and unimportant matters.”

DISCUSSION

This study explored attitudes about cannabis consumption among college students, including consumption patterns, their reasons for consumption, and their perceptions of short and longer-term effects on health and social and academic function. An understanding of the reasons young people consume cannabis and their perceptions of its harms and benefits is of potential importance to improving the implementation of cannabis legislation, policy, and public education in Canada which are undergoing review and development as of this writing.

General Pattern of Consumption

In our study among students in Vancouver, 42% of respondents reporting using cannabis within the last month while 8% reported daily use. These patterns of use are significantly higher than the Canadian average for college students, 40% of whom report having ever used cannabis,

and 16% of whom report using within the last month (American College Health Association, 2013). This pattern may be broadly consistent however, since the present sample is not assumed to be representative of the overall student population. The present survey was voluntary and is assumed therefore to be subject to self-selection bias – cannabis users may have been more motivated (or less motivated) to participate in the study compared to non-users. At the national level, Statistics Canada found that 51% had ever consumed cannabis and roughly a third of 18- to 24-year-old Canadians had consumed cannabis within the previous year. The 18 to 24-year-old age group was found to have the highest prevalence of cannabis use in the Canadian population (Rotermann & Langlois, 2015). It is clear that cannabis is widely consumed among college attendees, at least sporadically, with a significant portion of them consuming it daily. It should be noted that young adults have been found to downplay risks (Gough, Fry, Grogan & Conner, 2009) and under-report consumption of other harmful substances (tobacco and alcohol), which hints that usage frequency and the perception of harm could be under-reported by students in the present study.

Reasons for Use

Understanding the reasons college students consume cannabis provides insight into their perception of the social and therapeutic role of the drug in Canadian society, and also provides hints as to how students perceive and experience benefits and harms. Surprisingly, 43% of those who consumed cannabis indicated that it was for therapeutic reasons (most reported both therapeutic and recreational purposes combined). In comparison, the 2011 Canadian Alcohol and Drug Use Monitoring Survey, a large telephone survey conducted in all provinces and territories in Canada reported that 17.1% of cannabis consumers did so for medicinal purposes (Health Canada, 2011). Both of these results point out that a large portion of young adults identify cannabis as having therapeutic value to them.

Perception of Harm

While a perception of therapeutic value is widespread, a significant portion of cannabis

users perceived harm to their mental and physical health, social and school/work function. Aside from short-term psychoactive effects, and day-after fogginess, 39% of consuming students reported that it had harmed their physical health, and 21% reported perceived harm to their mental health. These longer-term impacts may also be reflected in the 25% of students who felt that cannabis had harmed their ability to manage school or work and had impaired their ability to concentrate at school.

With respect to perceptions of mental health and school effects, these findings confirm the results of other studies using objective tests that show adverse effects on working memory, motivation and ability to focus on mental tasks (Hanson, Winward, Schweinsburg, Medina, Brown & Tapert, 2010).

On the other hand, a significant number of students reported using cannabis for to address anxiety and for management of stress. Data from a 2013 study on the health of college students revealed that 28% of post-secondary students in Canada thought that anxiety had an adverse effect on their academic performance, with 38% identifying stress as a factor that interfered with their academic success, and 56% reporting feeling overwhelming anxiety at least once during the previous year (American College Health Association, 2013). A clinical study on the management of stress in the form of Post-Traumatic Stress Syndrome has been approved by Health Canada (Government of Canada) as a medical rationale for cannabis consumption (University of British Columbia News, 2016). Yet it already is an important reason for unofficial cannabis use among a significant portion of young adults experiencing school, work and family pressures, as indicated in significant commentary from these respondents. Evidently the perceived benefit of cannabis as a reducer of stress and anxiety overcomes concerns about perceived negative impacts on learning and cognition.

A further motivating reason for students to use cannabis is likely to be social, given that 30% of participants thought that cannabis had improved their social life and another 66% reported a mix of harmful and helpful benefits, or no impact. For those with difficulties in social areas, cannabis may offer one avenue for social engagement. In one British Columbia study, the odds of initiating cannabis use were found to be

significantly increased in youth with a weak self-perception of community belonging (Health Canada, 2016).

Implications for Education

A concern is that cannabis use is harming academic performance, with repercussions for individuals and for society as a whole. 25% of student cannabis users thought that cannabis use harmed their work or school function. Specifically, 25% of respondents reported difficulty focusing at school. Epidemiological, clinical and animal studies indicate that cannabis consumption has dose-dependent effects on a variety of neurological indicators and cognitive functions. At least some studies have shown an overall, long-term and permanent deficit in cognitive function in chronic, heavy consumers of cannabis. The present study surveys the perceptions of students with respect not only to their pattern of cannabis use, but their perception of its effects on them. Educational institutions may be experiencing the effects reflected in learning patterns, learning challenges and academic results. The apparent identification of cannabis consumption as a means of seeking relief from academic, social and family pressure may warrant further study to determine the extent to which students may require support in these areas. As well, a risk-benefit analysis could consider the benefits of any reduction in anxiety on learning resulting from cannabis use, along with the documented risks to cognitive function associated with cannabis use, especially for daily users.

Implications for Social Policy

This confirmation of the longer-term effects of cannabis supports the need for cannabis policy and legislation to address the potential educational, professional and economic impacts of chronic cannabis use on college students. The age at which recreational use of cannabis is being set by each province, mostly in line with the Canadian Government Task Force recommendation of the legal age of purchase to be the same as that for alcohol consumption (18 or 19 years of age depending on the province) (Health Canada, 2016), in contrast to the recommendation of the Colleges of Physicians and Surgeons of

Ontario and B.C. of a legal age for medical consumption of 25 years (2015).

Policy changes should include mechanisms that support public education concerning evidence of harm to cognitive and behavioural function at various stages of life. While adolescent cognitive development is sensitive to cannabis (Abdullaev, Posner, Nunnally & Dishion, 2010; Shollenbarger, Price, Wieser & Lisdahl, 2015), the next older cohort - those at college age - at least clearly perceive health cognitive impacts. Public education aimed at adolescents and college students may be particularly worth the effort as there is evidence that public awareness campaigns can result in reduced prevalence of consumption (Bachman, Johnston & O'Malley, 1990).

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