**INVESTIGATING THE KNOWLEDGE OF ALCOHOL AND MARIJUANA USE AND ITS COGNITIVE AND HEALTH EFFECTS AND THE ASSOCIATED SOCIO – DEMOGRAPHIC AND ECONOMIC FACTORS: A CROSS SECTIONAL STUDY OF UNIVERSITY STUDENTS IN OTTAWA, CANADA**.

Mohamad Abou el Foul

**Introduction**

Alcohol and marijuana are psychoactive drugs. Psychoactive drugs are known to alter human mental states and nerve functions. Continued use of alcohol and marijuana may cause significant impairment such as liver damage and mental health and respiratory issues (Zaman et al., 2015). According to Zaman et al., (2015), excess alcohol consumption contributes to 4.5% of the global burden of diseases and body harm. Excess alcohol use results in 20% to 50% of liver damage, epilepsy and poisoning. The public health effects of marijuana include brain damage, addiction and lung issues. Approximately 2% to 5% of students at the age of eighteen report using marijuana at least once per day. Alcohol and marijuana use are a common occurrence among university students globally. Close to 50% of students are reported to use alcohol while 30% report to have used marijuana in the previous one year. In Canada, alcohol and marijuana are among the most used psychoactive drugs by university students. Both recreational and medical marijuana are legal in Canada provided one has the relevant licenses and permits to grow, sell and consume marijuana. The fact that access to marijuana is easy many youths and university students have found themselves hooked to marijuana. Despite the consumption, marijuana and alcohol dependency have serious health consequences among the younger population. Approximately 83% of students in grade 12 (16 to 17 years old) have been associated with drinking alcohol. According to a survey by the center for addiction and mental health, 58% of students in Canada use alcohol, and 25% use marijuana for various reasons (Kushnir and Cunningham, 2014). Also, students have more resources to locate and obtain alcohol and marijuana as well as the freedom to use them. Studies show that university students are unaware of their institution’s substance-use policies (Khalid et al., 2014). The research topic is significant and relevant since alcohol and marijuana use is coupled with health effects. It is important to study the knowledge of alcohol and marijuana use among university students so that the drug counsellors can comprehend whether the students understand the effects to plan for counseling and rehabilitation of addicts. In this study, knowledge refers to the facts, information, awareness and familiarity of alcohol and marijuana and the health effects and socio-demographic factors associated with the drugs. Awareness of alcohol and marijuana will refer to how students perceive the two drugs in terms of effects related to health. Awareness and knowledge are perceived to contribute to changes in behavior. While this may be true at some extent, it may also be irrational considering how people decide on how to behave. Most people are usually informed but choose to ignore the facts that defy their view of what they want to hold on to. Creating too much awareness of something may be harmful and may create a ‘normality’ view (Kite et al., 2018). This comes up when the awareness focuses on the behavior such as the behavior on substance use. Instead, such awareness should focus on the long-term game of understanding and nurturing defensive factors. Kite et al., (2018) proved that awareness effectively increases knowledge of recommendations and health effects. The effect on behavior is however minimal. The study aims to investigate knowledge of alcohol and marijuana use, and health effects and socio-demographic factors associated with it, among university students in Ottawa, Canada.

**Literature Review**

A quantitative cross-sectional study was carried out in the United States to determine whether there was a relationship between the type of marijuana laws from student’s states of residence and college marijuana use. The study also sought to determine whether there was a relationship between marijuana law knowledge and marijuana laws in the state of Alabama. In the study a convenience sample of 391 undergraduate students participated (Burroughs, 2019). However, it was noticed that there was high usage of marijuana in states that had limited medical marijuana laws.

Alcohol use on university campuses in the United States of America is public health issue thus has called for much research on the same niche (Boudreau, 2013). The study by Boudreau (2013) investigating the effectiveness of two interventions. The first intervention aimed at exposing participant’s information regarding social norms and student alcohol usage. The second intervention focused more on the information regarding the impact of alcohol on the body and the brain. Those who reported high levels of drinks per week had less accurate perceptions regarding the effects of alcohol usage than those who reported less drinks per week.

According to a study carried out by Anyanwu and Tshitangano (2014) on the knowledge, practices and attitudes of university students regarding the use of drugs like alcohol and marijuana, many aspects regarding the two drugs were revealed. Marijuana and alcohol are the two most used drugs by university students in Canada. The quantitative study had 332 participants comprising of 138 females and 194 males. The participants selected using systematic and simple sampling strategies. Collection of data was done by asking the participants to fill out written questionnaires. The results of the study revealed that 214 students who represented 64.1% had high knowledge on matters concerning usage of psychoactive drugs. Additionally, more than half (52.6%) had knowledge regarding drugs which can cause reduced concentration, 42% had knowledge of the adverse effects of using drugs.

In another study done on the use of psychoactive substances in medical students in 2017, out of the total 150 users of psychoactive substances, 107 were male, while 43 were female. The usage of marijuana and alcohol is prevalent more in males with a very high difference margin. Men contribute to 71% of users while women only make 29%. From the study, it was observed that substance use was at a higher rate in members of senior year classes as compared to those in their first year of study, with an increase from 17.11% in first years to 30.06%, and 24.24% in fourth and final years respectively (Nawaz et al., 2017).

Heckman and Collins (2011) research on substance-related knowledge, attitude, and behavior among university students, 47% of the male students interviewed admitted to using substance occasionally, while 35% of female students admitted to being substance users. The research showed that students who used drugs recorded a low score on the drug knowledge pre-test quiz given to them during the research compared to students who were not involved in drug use. Knowledge of drugs for students who did not use drugs did not increase but rather decreased over the course of the semester.

Few studies have looked into the knowledge of alcohol and marijuana use and its health effects and the associated socio demographic factors. More so, most research does not have a clear focus on the health effects of these drugs to university students.

**Research questions:**

What is the knowledge of university students on alcohol and marijuana use and its cognitive and health effects in the University of Ottawa, Canada and what socio demographic and economic factors are associated with good knowledge?

**Aim:** This study aims at investigating the knowledge of students in university in Ottawa about alcohol and marijuana use and factors associated with good knowledge.

**Objectives:**

* To critically appraise available literature and the level of knowledge of university students in Canada and similar countries on alcohol and marijuana use and factors associated with it.
* To collect data on the knowledge of university students on alcohol and marijuana use as well as factors associated with good knowledge using questionnaires from Boudreau (2013) study, Jaworowski et al., (2014) research, Burroughs (2019) study and Schmits et al., (2016) research.
* To analyse the data on the level of knowledge of university students in Ottawa and use chi square and multivariate logistic regression to identify the socio demographic and economic factors associated with good knowledge.
* To make recommendations on the best factors associated with good knowledge of alcohol and marijuana use.

**Epistemological approach**: A positivist approach will be employed. Positivism is a research philosophy that agrees that only information obtained through observation and measurement is credible. Positivist approach usually relies on scientific evidence for instance experiments to bring out true nature of the world (Quick and Hall, 2015). Its focus is on evidence when researching for facts and the significance of objectivity. Since epistemology focuses on known facts, quantitative research will be suitable to postulate that facts can be distinguished from values/ this will enable us to realize evidence that the research will correspond to the facts in the field. Positivist research is best suited for this research because it will help generate trustworthy knowledge on the two drugs among university students.

**Positionality:** As a researcher my perception regarding the topic of knowledge of alcohol and marijuana use, and factors associated with it, among university students is that the students are aware of the effects of alcohol and marijuana use. I will ensure that I will rely on the data and results from the research. I will not rely on my perceptions to avoid being bias.

**Methods**

***Study design****:* This study will take a cross-sectional design: the outcomes and the exposures are measured at a single point in time (Setia, 2016)

***Setting****:* The study population will be drawn from the University of Ottawa. Ottawa is Canada's capital and university of Ottawa is the main educational Institution, thus proving an ideal setting for this study.

***Sampling frame and Sampling size****:* The study sample will be university students. Study participants will be conveniently sampled from the University of Ottawa. The sample size will be determined using a sample population formula for cross-sectional surveys based on 42% knowledge of drug abuse from a study from University of Venda in South Africa (Ajao et al., 2014)

n=1.962P (1-P)/E2 where

n=sample size

P=proportion of the population with the desired factor

E=Acceptable margin of error (5%)

n=1.962 x 0.42 x 0.58/ (0.05)2=374.32

An additional 10% will be added for non-response for questions =413

***Inclusion Criteria****:* Ottawa university students aged 18 to 24 years, who are taking Health sciences, Social Sciences and Education courses only.

***Exclusion Criteria***: University students who are 25 years and older, not attending the University of Ottawa and not taking Health Sciences, Social Sciences and Education studies.

***Recruitment****:* Electronic notices about the study will be made available to students through student forums and clubs (following approval from the university). The notices will have a link to the participant information sheet (and the student’s contact details so they are able to ask questions) and a link to the consent form and questionnaire.

***Data collection*:** Data will be collected using Survey Monkey online survey.

***Instrument:*** Data will be collected using validated questions from a number of questionnaires (appendix): Boudreau (2013), Jaworowski et al., (2014), Keyhani et al. (2018), Schmits et al., (2016). Socio demographic questions will be added to these questionnaires.

***Pilot Testing***: The first ten students to take part will be used to test the questionnaire to verify that questions can be understood. A pilot study will enable us to obtain high-quality outcomes (In, 2017). Questions having ambiguity incomprehension to the study participants will be rephrased or removed from the study.

***Data analysis***: Data will be analysed using SPSS. Descriptive statistics will be generated on the prevalence of marijuana and alcohol use among university students aged 18 to 24. Knowledge scores will be generated. A score of (1) for a correct answer and (0) for an incorrect/don't know answer, then sum these up to get a total score for each person and calculate the mean/median across participants, then categories each into above or below the mean/median; this will be used the dependent variable ‘total knowledge score’ (high/low). Chi-square will be used to determine bivariate associations of knowledge score of marijuana and alcohol use with socio-demographic characteristics. A multivariable logistic regression will be performed to examine the associations between knowledge score and the significant bivariate associations at a confidence level of 0.05.

Table 1: A description of the Independent Variables in the Study

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable Name** | | **Coding** | **Type data** | | **Aim of analysis** | **Test used** | |
| **Gender** | | 1= Male  2= Female  3= Other | Categorical | | **Descriptive analysis**    **Bivariate analysis**   To measure association between gender and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | Number and percentage      Chi-squared    Logistic regression | |
| **Age** | | 1 = 18-20  2 = 21-24 | Categorical | | **Descriptive Analysis**  **Bivariate Analysis**  To measure association between age and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | Number and percentage  Chi-squared  Logistic regression | |
| **Year** | | 1 = First year  2= Second year  3= Third year  4= fourth year | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between age and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | Number and percentage  Chi-squared  Logistic regression | |
| **Course** | | 1=Health sciences  2=Social sciences  3= Education | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between age and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-squared  Logistic regression |
| **Who they live with** | | 1=Alone  2=Parents  3=Relatives  4=Friends | Categories | | Descriptive analysis  **Bivariate Analysis**  To measure association between who the student lives with and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analysis. | | Number and percentage  Chi-squared  Logistic regression |
| **Ethnicity** | | 1=Canadian  2=Non-Canadian | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between ethnicity and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-square  Logistic-regression |
| **Parent(s) you have** | | 1= One Parent  2= Two Parents  3= Other | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between number of parent(s) they have and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-square  Logistic-regression |
| **Parental Death** | | 1=alive  2= Deceased  3= At least one parent deceased | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between parental death and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-square  Logistic-regression |
| **Parental Education** | | 1=University Degree  2=At least one with a university degree  3= High School Diploma  4=At least one with a high School Diploma  5=Other | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between parental education and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-square  Logistic-regression |
| **Parent’s Employment Status** | | 1= Working -Full Time  2=Working – Part Time  3= At least one parent working – Part Time  4=Unemployed  5= At least one parent unemployed | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between parent’s Employment status and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-square  Logistic-regression |
| **Student Employment Status** | | 1= Working – Full Time  2= Working – Part Time  3= Unemployed | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between Student’s Employment status and the knowledge of university on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses. | | Number and percentage  Chi-square  Logistic-regression |
| **Household income per annual (in ‘000)** | | 1=<CA 20,000  2=CA (20,000 -40,000  3= >CA 40,000 | Categorical | | **Descriptive analysis**  **Bivariate Analysis**  To measure association between annual household income and the knowledge of university students on Marijuana and alcohol use and factors associated with it.  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses? | | Number and percentage  Chi-square  Logistic-regression |
| **Beleifs about the effect of Marijuana and Alcohol** | **1=Strongly Disagree**  **2=Disagree 3=Unsure 4=Agree**  **5=Strongly Agree** | | **Categorical** | **Bivariate Analysis**  To measure the association between socio-demographic and socio-economic factors and Beliefs about the effects of Marjuana and Alcohol  **Multivariate Analysis**  To measure the joint effects of all variables which were significant in the bivariate analyses? | | | Number and percentage  Chi-square  Logistic-regression |

**Ethical considerations:** Ethical approval will be gained from the University of Ottawa and University of Liverpool. The Participant Information Sheet (PIS) will be used to provide potential participants with information about the study. Confidentiality of participant’s information will be observed; Personal identifying data such as names and address will not be gathered. On the survey monkey, the IP address identifiers will be turned off to protect anonymity. All study participants will be asked to read the consent questions on the first page of the questionnaire to tick. It will be emphasized that participants will be allowed to withdraw from the study at any time with justification and repercussions. Data will be stored on a password protected computer for five years.

**Results:** The research will establish the degree of awareness and general knowledge of university students in Ottawa on drug abuse and factors associated with knowledge. This will make avail information on ways of increasing awareness and alleviating the ills of addictive substance use to students and society at large.

**Timeline:** Proposal approval: November 2020, Ethics approval: July 2021, Data collection: July/August 2021, Write chapters: August 2021. Submit full draft: 10th September 2021 Submit final draft: 20th September 2021.

**Costs:** The cost incurred is because of the internet, Survey Monkey and printing expenses. The approximate costs will total to around $500. All these costs will be borne by the researcher.

Word Count: 2200

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**APPENDIX**

**THE KNOWLEDGE OF ALCOHOL AND MARIJUANA USE AND ITS HEALTH EFFECTS. WE WOULD LIKE TO ASK YOU FOR SOME INFORMATION ABOUT ALCOHOL AND MARIJUANA**

**PART A: Personal Information of The Survey Participant**

1. Please tick your appropriate year of study.

1st-year student  2nd-year student  3rd-year student 4t-year student

1. Please indicate your gender:

Male Female Other Identify-------

1. Please indicate your Ethnicity:

Canadian  Non- Canadian

1. Please Indicate your age

18-20 years 21-24 years

1. Please indicate your course of study

Health Sciences Social Sciences  Education

1. Please indicate who you live with?

Alone  Parents Relatives Friends

1. Please indicate how many parent(s) you have?

☐ One parents ☐ Two Parents ☐ other Please Identify ------

1. Please indicate your Parental death:

☐ alive

☐ Deceased

☐ At least one parent deceased

1. Parent’s Education:

university degree

At least one with a university Degree

High school Diploma

At least one with a high School diploma

☐ other please Identify ----------

10. Parent’s Employment Status:

Working – Full Time

Working – Part Time

At Least one parent working – Part Time

Unemployed

At least one Parent unemployed

11. Which best describe your current employment Situation?

Working- Full Time

Working – Part time

Unemployed

12. Household income per year:

< CA 20,000  CA(20,000 – 40,000)  > CA 40,000

**PART B: The effects of alcohol.**

**The NEXT questions will either be True or False. If you think the answer is TRUE tick “true”. If you think the answer is FALSE tick “false”. If you do not know the answer to the question, DO NOT GUESS, tick “I don’t Know” in the box**

1. Alcohol beverages do not provide weight-increasing calories.

True False  I don’t Know

1. Alcohol is usually classified as a stimulant.

True False  I don’t Know

1. Many people drink to escape from problems, loneliness and depression.

True False  I don’t Know

1. A person cannot become an alcoholic by just drinking beer.

☐True ☐False  I don’t Know

1. Drinking in moderation can result in relaxation, enhanced social interactions, and a feeling of well-being.

☐True ☐False  I don’t Know

1. Self-help groups (Alcoholics Anonymous) are not helpful for those suffering from Alcohol Use Disorder.

☐True ☐False  I don’t Know

1. A blood alcohol concentration of .02% causes a person to be in a stupor.

☐True ☐False  I don’t Know

1. A glass of beer has very few calories so it has no impact on a diet.

☐True ☐False  I don’t Know

1. Eating while drinking will slow down the absorption of alcohol into the body.

☐True ☐False  I don’t Know

1. Consuming alcoholic drinks mixed with water is a way of avoiding getting drunk.

☐True ☐False  I don’t Know

1. Alcohol use is associated with about 50% of homicides and 25% of suicides.

☐True ☐False  I don’t Know

1. Alcohol abuse reduces life expectancy by about 10years.

☐True ☐False  I don’t Know

1. Men are more likely than women to be binge drinkers.

☐True ☐False  I don’t Know

1. Hypoglycemia may be caused by acute alcohol intoxication.

☐True ☐False  I don’t Know

1. Alcohol use rarely causes disturbed sleep.

☐True ☐False  I don’t Know

1. There is no genetic basis for alcohol use disorders.

☐True ☐False  I don’t Know

1. Vision impairment or hallucination cannot be caused by alcohol

☐True ☐False  I don’t Know

1. Alcohol consumption in pregnancy does not affect the fetus.

☐True ☐False  I don’t Know

1. Alcohol consumption during pregnancy does not affect the child’s postnatal development.

☐True ☐False  I don’t Know

20. DT’s (Delirium tremens) normally appears after at least 5 years of heavy alcohol use.

☐True ☐False  I don’t Know

**PART C: Biological Consequences of Binge Drinking Scale**

*When answering the following questions please consider the below bolded terms in light of their provided definitions. Please read the questions carefully and answer honestly*

**Binge drinking:** consuming at least 4-5 alcoholic drinks in a single occasion**.**

**Moderate drinking:** One drink an hour, no more than 2-3 drinks per day.

**Adolescent:** 10-19 year olds

**Binge drinking**: consuming at least 4-5 alcoholic drinks on a single occasion.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | STRONGLY AGREE | AGREE | UNSURE | DISAGREE | STRONGLY  DISAGREE |
| 1. Consuming alcohol in moderation is beneficial for the physical health of an 18-22 year old. |  |  |  |  |  |
| 2. Alcohol is an addictive drug |  |  |  |  |  |
| 3. The adolescent brain is more susceptible to damage from binge drinking than a fully  developed adult brain. |  |  |  |  |  |
| 4. The human brain is still in the process of development in the ages of typical college student  (18-22). |  |  |  |  |  |
| 5. Binge drinking 1-2 times per week can have a negative effect on a young adult’s learning and  memory function. |  |  |  |  |  |
| 6. Young adults who abuse alcohol are more likely to have higher levels of self-rated anxiety and  depression |  |  |  |  |  |

**PART D : Effects of smoking marijuana**

***The NEXT questions will either be Yes or NO. If you think the answer is YES tick “Yes”. If you think the answer is NO tick “No”.***

1. **What do you believe are the benefits of marijuana?**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **YES** | **NO** |
| 1 | Pain management |  |  |
| 2 | Treatment of disease (such as epilepsy or multiple sclerosis) |  |  |
| 3 | Relief from stress, anxiety, or depression |  |  |
| 4 | Improved appetite |  |  |
| 5 | Improved sleep |  |  |
| 6 | Help decreasing or stopping other medicines |  |  |
| 7 | Improved creativity |  |  |
| 8 | Improved focus or concentration |  |  |
| 9 | Increased energy |  |  |
| 10 | Other benefit |  |  |

1. **What do you believe are the risks of marijuana?**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **YES** | **NO** |
| 1 | Addiction to marijuana |  |  |
| 2 | Impaired memory |  |  |
| 3 | Increased use of other drugs |  |  |
| 4 | Personal or relationship problems |  |  |
| 5 | Decrease in intelligence (IQ) |  |  |
| 6 | Decrease in energy |  |  |
| 7 | New or worsening health problems |  |  |
| 8 | Increase in stress, anxiety, or depression |  |  |
| 9 | Disrupted sleep |  |  |
| 10 | Other risk |  |  |

# Part E: Marijuana Effect Expectancy Questionnaire-Brief (MEEQ-B)

The following statements about the effects of marijuana. Answer each statement according to your own personal thoughts, feelings, and beliefs about marijuana.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly  Disagree | Disagree  Somewhat | Uncertain | Agree  Somewhat | Strongly  Agree |
| 1.  Marijuana makes it harder to think and do things (harder to concentrate or understand; slows people down when they move). |  |  |  |  |  |
| 2. Marijuana helps a person relax and feel less tense (helps a person unwind and feel calm). |  |  |  |  |  |
| 3. . Marijuana helps people get along better with others and it can help a person feel more sexual (talk more; feel more romantic). |  |  |  |  |  |
| 4. Marijuana makes people feel more creative and perceive things differently (music sounds different; things seem more interesting). |  |  |  |  |  |
| 5. Marijuana generally has bad effects on a person (people become angry or careless; after feeling high a person feels down) |  |  |  |  |  |
| 6. Marijuana has effects on a person’s body and gives people cravings (get the munchies/hungry; have a dry mouth; hard to stop laughing) |  |  |  |  |  |

**THANK YOU FOR YOUR TIME!**