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Substance Abuse and Mental Illness Among Youth in the United States

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This is to certify that the doctoral study by

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Walden University
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Abstract

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MPH, Capella University, 2012

BS, Georgia State University, 1995

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

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Abstract

Despite the trends showing a reduction in the use and abuse of drugs among American adolescents, the prevalence rates remain high. There is also comorbidity of mental illnesses among the adolescents using drugs. The aim of this study was to determine the presence and nature of the association between the use and abuse of marijuana and alcohol and mental illnesses among the American adolescent population. The noted comorbidities and the hypothesized association between the substance abuse and mental illnesses were explained using the expectancy theory. Using a quantitative research methodology, secondary data from the National Survey on Drug Use and Health for 2014 and 2015 were analyzed. Data analysis yielded a positive but weak association between use and abuse of alcohol and marijuana through proxies such as marijuana use in the past month ($p = 0.01$), first use of marijuana ($p = 0.016$), alcohol use disorder in the past year ($p = 0.002$), alcohol dependence in the past year ($p = 0.001$), and the occurrence of mental illnesses. The association was statistically significant in all proxies except alcohol use in the past month. F-test results were also statistically significant ($p = 0.022$, $R^2 = 0.242$). The findings showed that adolescents who used marijuana and alcohol were more likely to develop mental illnesses. It is recommended for relevant federal and state governments and public health agencies to develop social programs to address the two issues inclusively rather than exclusively.

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Section 1: Foundation of the Study and Literature Review

Introduction

Mental illness is one of the public health concerns among the youth in the United States. Schwarz (2009) argued that the youth, particularly the adolescents, are vulnerable to the development of mental illnesses due to the developmental changes that are taking place in their brains. The confluence of the development in their brains and the hormonal changes that they experience predispose them to depression (Schwarz, 2009). Even more compelling is the argument that the adolescents, owing to the confluence of the development in their brains and the hormonal changes, have a higher likelihood of engaging in behaviours angled to offer thrills.

Depression is considered the most commonly observed mental mood disorder and is an emotional state of intense and persistent sadness (Mutrie, 2000). Episodes of mild sadness occur to everyone, but depression consists of long-term periods, endless bad mood, feelings of hopelessness, and a lack of satisfaction. Mood disorders (formerly known as affective disorders) include a broad range in the category of disorders, including the clinical picture of pathological mood and concomitant disorders. Examples of mood disorders are depression, euphoria, and anger (Taylor, 1999). Major mood disorders are common in the general population; patients experience primarily a pathologically persistent and extremely depressed mood that may alternate with an excessively pathologic euphoric feeling, as in the case of bipolar disorder (Reinecke &

Davison, 2002). Mood disorders get accompanied by several signs and symptoms that affect all the functional areas (Reinecke & Davison, 2002; Taylor, 1999).

According to the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*) by the American Psychiatric Association (2000), mood disorders are divided into categories of (a) major depressive disorder, (b) dysthymic disorder, (c) depressive disorder not otherwise specified, (d) bipolar disorder, (e) cyclothymic disorder, (f) bipolar disorder not otherwise specified, (g) mood disorder due to a general medical condition, and (h) substance-induced mood disorder. Today, depression is one of the most common diseases in the mental health sector (Kessler et al., 2003). Marginalized for decades, it has only recently received the perception from both the scientific community and the stakeholders for its propagation range in the societies of the developed and developing countries.

The World Health Organization (2016) has estimated the incidence of depression among the entire population around the world to be 350 million people. It is considered the most widespread mental illness in the United States, affecting approximately 40 million adults, about 18% of the country's population (Kessler, Chiu, Demler, & Walters, 2005). In 2014, about 15.7 million, or 6.7%, of adults in the United States, had at least one incidence of major depression in the previous year, while the number of patients at a lifetime risk of experiencing major depression is at approximately 17% (Center for Behavioral Health Statistics and Quality, 2015).

Statistics with respect to the country's young population make depression the most common mental illness in particular age ranges (Bose, Hedden, Lipari, & Park-Lee, 2016). In 2015, around 3 million adolescents, or 12% of the total age group between the ages of 12 to 17, had at least one incidence of major depression in the previous year reaching an all-time high in comparison to the period between 2004 to 2014 (Bose et al., 2016). About 8.8% of the age group experienced a major depression episode with severe impairment. Major depression episodes presented a higher percentage of female adolescents with 19.5% compared to 5.8% for male adolescents. Of adolescents aged 15, about 16.1% reported a major depressive episode, and if a teenager had two or more ethnic races in their family, the number was 16.6% (Bose et al., 2016). Of the number of reported events in 12.5% of the population, the teens who received treatment numbered 39.3%, or 1.2 million young people.

The statistics become even more important when considering that very often depression is confused with little feelings of sadness or frustration related to various events from daily life (Barker, 1992). The oversight results in underestimating depression's seriousness in depressed people who do not realize they have a mental illness. It allows for a cycle to begin, resulting in patients with depression sometimes finding it difficult to recover without the help of specialists in the field of mental health (Graham, 2010).

Different researchers have explored different perspectives regarding the causative elements or the predisposing factors of depression and other mental ailments in the youth.

One of the prevailing themes is the linkage between substance abuse and the occurrence of mental illnesses in the youth. For instance, Wu et al. (2010) found that the disorders that are related to substance abuse were comorbid with disorders that are related to anxiety. The researchers attributed this finding to the fact that during the adolescent stage of development, young people are more likely to develop the tendencies towards substance use.

Schwinn, Schinke, and Trent (2010) found an association in the different direction, reporting that the use of illicit drugs, tobacco, and alcohol in the urban youths in the late adolescent stage of development was influenced by mental health and gender among other issues. Even though they found that gender was not a predictive variable in the use of illicit substances and other drugs, they reported a statistically significant association between mental health and substance abuse (Schwinn et al., 2010). More specifically, the researchers found a linear relationship where the urban youth who were reported with poorer mental health were also more likely to be more involved in substance abuse.

Further inquiry into this subject is warranted by the rising prevalence of mental health issues among the youth, the high likelihood of the youth to engage in substance abuse, and the findings of a linear association between mental illness in the population and substance abuse. The findings from the study have significant social implications. They will contribute towards resolving the issues of substance abuse and mental health

disorders from the point of collective understanding, especially in a population where the two issues are prevalent as illustrated by Schwarz (2009) and Bose et al. (2016).

This part of the dissertation is comprised of two sections. The first of two sections will delve into the foundation for the study and a review of related literature. In addition to the introduction and background, the section will also feature subheadings such as the problem statement, purpose of the study, research questions and hypotheses, theoretical foundation of the study, nature of the study, literature search strategy, literature review related to key variables, definitions, assumptions, scope and delimitations, and the significance, summary, and conclusions.

The second section will delve into the research design and methods, and the data collection and analysis procedures. Some of the featured subheadings in addition to the introduction will include research design and rationale, methodological aspects such as study population, sampling and sampling procedures, instrumentation and operationalization of constructs, the operationalization of variables, data analysis plan, threats of validity, ethical concerns, and a summary of concepts in the section.

Problem Statement

The trends of substance abuse among the youth are still alarming even though trends have shown that the prevalence rates have been reducing steadily. The Substance Abuse and Mental Health Services Administration (SAMHSA, 2014) reported from their 2013 national survey that the prevalence of illicit drug use for the population aged

between 12 and 17 years was at 8.8% in 2013. The reported rate was lower when compared to the periods between 2002 and 2007 and the prevalence rate reported between 2009 and 2012. As shown in Figure 1, the youth were abusing a wide variety of drugs.

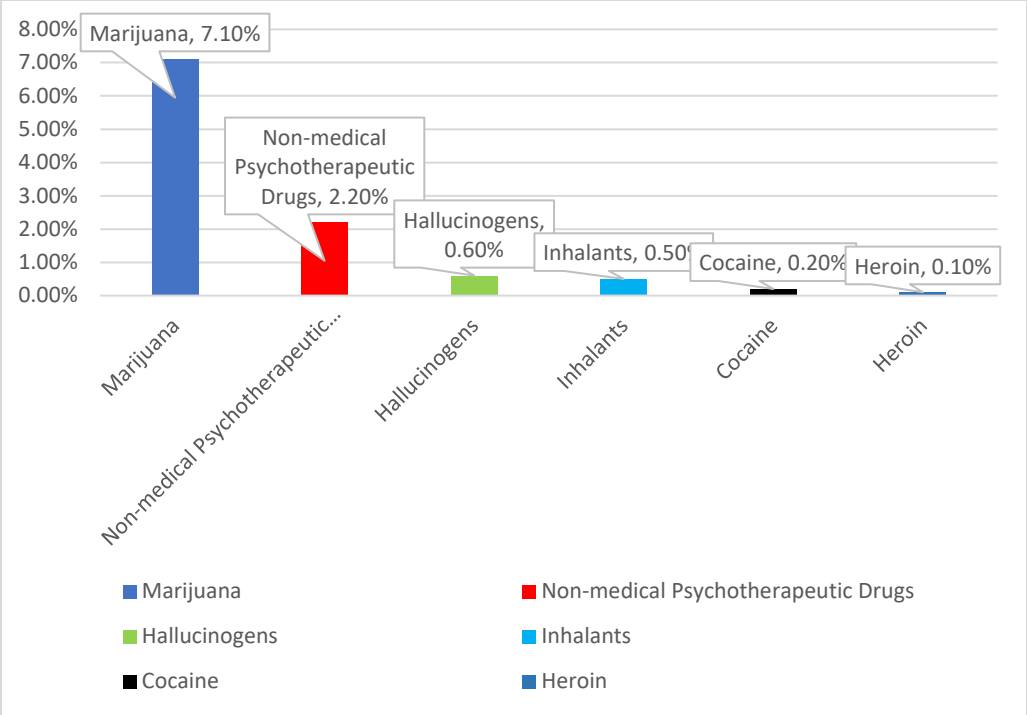

Figure 1. The users of different drugs in 2013 for the population aged 12-17 years. From *Results From the 2013 National Survey on Drug Use and Health: Summary of National Findings. NSDUH Series H-48, HHS Publication No. (SMA) 14-4863*, by Substance Abuse and Mental Health Services Administration, 2014, Rockville, MD: Author.

Christensen, Pallister, Smale, Hickie, and Calear (2010) found that millions of the youth in America suffer from depression and other mental illnesses. Among some of the reasons associated with the mental illnesses were the physical, emotional, social, and

psychological changes that occur in their lives at this stage of life. As reported by Schwarz (2009), the confluence of these changes and the development of their brains might predispose them towards thrill-seeking behaviours, some of which include the use and abuse of nontherapeutic and illicit substances. Depression leads as the most common mental disorder in U.S. teens. According to Teen Help (2014), in 2014, approximately 2.8 million young people aged 12 to 17 years experienced the condition. Out of this, 17% were female and 5.7% male. As a consequence of depression, most American youths indulge in activities such as substance abuse and are more likely to commit suicide by 12% (Teen Help, 2014).

These arguments show an interplay between mental illnesses and substance abuse among the youth. This is a finding that has been reported in numerous studies. For instance, Kaminer, Connor, and Curry (2007) reported that substance abuse was comorbid with major depressive disorders. The same findings were reported by Wu et al. (2011), who found that comorbidity of suicidal ideations and the use and abuse of substances was reported in children and adolescents. While these and more studies have either found comorbidity or linear relationship between the two variables, it is noteworthy that findings that benefit from more recent data are required to determine whether the linear association reported by earlier studies is still as significant with the passage of time. Additionally, a study using national-level data is important to determine whether the association between the two variables in the study population is significant when national-level data are considered.

In addition to the perspectives discussed above, it is noteworthy that the reporting of incidence and prevalence rates has been done more commonly at the national level, especially when federal agencies have published such data. Youth.gov (n.d.) has used this format when reporting on youth statistics relating to the use and abuse of illicit substances. However, the aim of such agencies is to reduce the incidence and prevalence throughout the country by issuing generic policies and guidelines that are then adopted by state agencies and other agencies at the lower levels of government. The implication of reporting the prevalence and incidence at the national level is that generally acceptable levels at the national stage give the impression that substance use and abuse, as well as the comorbidity of mental disorders, is under control. However, comparing the national data with the state level data would highlight the states where the problem is more prevalent compared to the national averages. Such an analysis would be beneficial in identifying where more efforts are required.

Purpose of the Study

The reason why researchers have focused on United States adolescents is that, as presented previously, depression is the most common mental illness among American youth, with current percentages high enough to constitute a stimulus for investigation and research (Bose et al., 2016). Concurrently, and considering that the current adolescents in the United States are tomorrow's adults, it can be assumed that today's depressed adolescents will be tomorrow's depressed adults, increasing the already high percentage of depressed adults in the country. The aim is to determine the existence and nature of the

association between the use and abuse of alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States. To enable the inquiry, the independent variable was use and abuse of alcohol and marijuana while the dependent variable was mental illnesses. The covariate variables in the study were the age group of the youth from whom the data were collected. The failure to consider other covariate variables is explained in the limitations section.

Research Questions and Hypothesis

The following are the research questions and null and alternative hypotheses that guided the quantitative inquiry:

Research Questions

The following are the research questions that guided the proposed inquiry.

1. What is the association between the use and abuse of alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States?

2. What is the difference between use and abuse of alcohol and marijuana and mental illnesses at the state level and at the national level?

Hypotheses

$H_0$1: There is no statistically significant association between the use and abuse of alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States

H_a1: There is a statistically significant association between the use and abuse of alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States.

$H_0 2$: There is no statistically significant difference between state-level data and the national averages on the use and abuse of alcohol and marijuana and on mental illnesses among the youth aged between 12 and 17 years in the United States.

$H_a 2$: There is a statistically significant difference between state-level data and the national averages on the use and abuse of alcohol and marijuana on mental illnesses among the youth aged between 12 and 17 years in the United States.

Nature of the Study

For this study, I took a quantitative approach. While there were many justifiable reasons for the choice of this research method, the most significant was its aptness in answering the research question. A quantitative approach is required in determining the association between two variables. Xu (2004) argued that when dealing with quantitative variables, the relationships between the quantitative study variables is established by looking at the patterns in the data through the help of data manipulation software. It involves the calculation of the coefficient of the independent or predictor variable that can be used to explain the changes that are observed in the dependent variable (Xu, 2004). Curwin and Slater (2008) also reported the use of the different mathematical

formula to calculate different coefficients to describe data as well as enable the determination of inferences in the relationship between different quantitative variables.

The National Database

The current study drew from a national database prepared and published by SAMHSA. The specific database was the features population data and is the product of the National Survey on Drug Use and Health (NSDUH). This is a survey that has been performed under the mandate of the federal government in all the states since 1971 (SAMHSA, 2016). As a national database, it primarily provides statistical information for use by all federal and state agencies on the use abuse of illicit substances. The NSDUH collects information from citizens of the United States who are over 12 years, noninstitutionalized, and of the civilian designation (SAMHSA, 2016).

In addition to the trends in the use and abuse of illicit substances, the database also features information on mental illnesses, mental health problems, interventions and treatments for the disorders related to substance abuse, and the mental illnesses that co-occur in the population also using and abusing illicit substances (SAMHSA, 2016). In addition to the database containing national-level data, there are deliberate measures implemented to ensure the validity and integrity of the data (SAMHSA, 2016). For instance, random sampling is employed in the identification and selection of the sample. The result is a representative sample that best reflects the state of the nation with regards to the variables for which the data is collected (SAMHSA, 2016).

The inclusion and exclusion criteria that are specified in the methodology for the survey also ensure that data do not include any outliers. During the collection of the data, researchers implement deliberate measures to encourage the respondent to give honest responses to the prompts in the survey (SAMHSA, 2016). For instance, the survey uses the audio computer-assisted interviewing protocol to improve the confidentiality and privacy when giving the responses to the prompts. The aim is to ensure that the respondents feel safe enough to be honest when they are giving responses to issues considered to be sensitive, such as the use of illicit drugs (SAMHSA, 2016).

The database contains data on 15 variables, all of which measure the use and abuse of illicit substances and mental illnesses. The illicit substances that are considered in the database include marijuana, cocaine, and heroin (SAMHSA, 2016). In addition, the database contains data on the use and abuse of alcohol, cigarettes, and tobacco. For some of these drugs, the database explores the use of the substance in the past year, month, and the first-time use of the drug. For alcohol, the database explored alcohol dependence and use disorders (SAMHSA, 2016).

The variables used to measure mental illnesses include the occurrence of serious mental illnesses, any mental illnesses, major episodes of depression, and serious suicidal ideations. The respondents were asked to limit their responses to the past year (SAMHSA, 2016). All the data collected on these variables were grouped per the age group of the respondents and the state in which they resided (SAMHSA, 2016). The age groups into which the data were grouped include all participants aged 12 years and

above, between 12 years and 17 years, between 18 years and 25 years, and 26 years and above (SAMHSA, 2016). The data were included for the 50 states in the country and the District of Columbia (SAMHSA, 2016).

There were three classes of variables relevant to the current inquiry. The independent variable for the inquiry was the use and abuse of alcohol and marijuana. The national database used for the inquiry contains data on this variable. The variable was measured using different proxies that illustrate the incidence and total percentage for use and abuse of different substances from 50 states as well as the District of Columbia. The proxies for the independent variable relating to marijuana as a drug included *marijuana use in the past year*, *marijuana use in the past month*, and the *first use of marijuana*. The proxy for cocaine as a drug was *cocaine use in the past month*. The other drug to be assessed was alcohol using proxies such as *alcohol use in the past month*, *alcohol use in the past month among individuals aged 12 to 20,* and *alcohol used disorder in the past year, alcohol dependence in the past year*. The other drugs explored as part of the independent variable included heroin, tobacco, and cigarette using proxies such as *heroin use in the past year*, *tobacco product use in the past month*, and *cigarette use in the past month*. Despite a rich dataset containing many variables, this study focused on the use and abuse of alcohol and marijuana among the youth of different age classification and the influence the two independent variables and their proxies have on the occurrence of mental illnesses.

The dependent variable for the study was mental illnesses. While mental illness is an umbrella term that describes various mental disorders, the national database used for the inquiry contained data on specific proxies that were used to measure mental illnesses. The first proxy through which mental illness was measured is a *serious mental illness in the past year*. The other three proxies were *any mental illness in the past year*, *had serious thoughts of suicide in the past year*, and a *major depressive episode in the past year*. These proxies were used in the proposed inquiry. The covariate variable in the proposed study was age. The national database from which the data were derived grouped the data by state of residence and age. Through this inquiry, I determined whether age as a covariate variable was a significant predicting variable.

In addition to the independent and dependent variables, there were other confounding variables that need to be considered. Some of the confounding variables included the environmental influences. One of the aspects of this confounding variable and one of significance was the different levels of control in the neighbourhoods in which the youth lived. Kulis, Marsiglia, Sicotte, and Nieri (2007) explored the influence of different levels of social control such as the parochial, private, and public levels. The private level of social control emanates from the attempts of friends, parents, and the extended family to control the behaviour of the young person (Kulis et al., 2007).

Social control at the parochial level is applied from the social institutions within the community such as the churches, youth programs, and schools. The public social control depends on the ability of the community in which the young people live to

acquire the goods and resources such as community youth centers, recreational facilities, law enforcement services, and prevention programs (Kulis et al., 2007). The concerted effort from these sources of social control has an influence on the behaviour of the young person. It is arguable that the best results are achieved when each of the sources of social control contributes towards restricting, teaching, and refining the behaviour of the youth.

Consequently, studies have linked the environment with the patterns of use and abuse of illicit substances among the youth. For instance, Quitno (2003) found that there was a tendency for risk behaviours involving the use and abuse of illicit substances in the neighbourhoods in low socioeconomic settings. This is because some of the enduring demographic characteristics of the people living in such neighbourhoods include single-parent families, parents with different drug-related disorders, and high rates of crime (Quitno, 2003) These factors coincide with low forms of social control from different levels. The private level of social control might be inexistent or inadequate where the youth are orphaned or are in single-parent families. The disenfranchised nature of some of these low socioeconomic setting neighbourhoods means that many of the social amenities, goods, and services are not available for the young people. This further contributes to a deterioration of public level of social control (Samson, Morenoff, & Earls, 1999). In scenarios where the social control is not existent or inadequate from different levels, there is a higher likelihood that the youth will engage in risky behaviours such as the use and abuse of illicit substances (Kulis et al., 2007).

Meyers and Dick (2010) also explored the environmental influence. In addition to the social environment, Meyers and Dick explored the effect of the genetic environment on the likelihood of the youth engaging in the risky behaviours such as the use and abuse of illicit substances. The researchers found that some of the disorders related to use and abuse of illicit substances are heritable. For instance, the researchers found that alcoholism as a drug-related disorder could be passed down generations through genetically related mechanisms.

Even with this biological aspect of the debate on the use and abuse of illicit substances among the young population, it is still arguable that this aspect of the environmental influence is still a confounding variable. In advancing this argument, Kulis et al. (2007) argued that the presence of social controls could mitigate the effect of some of the environmental factors. For instance, parental and parochial control can attenuate the influence of the genetic environment by offering both structure and an environment where the youth understand the ills of the use and abuse of illicit substances (Kulis et al. 2007). The provision of recreational facilities, youth programs, and community centers among other public resources and goods can also offer the support and healthy alternatives to attenuate the influence of the genetic environment on the likelihood of the young person to engage in the risky behaviours such as the use and abuse of illicit substances.

Socioeconomic status is yet another confounding variable of significance in this study. Different markers of the socioeconomic status of the young population have been

studied for their influence on the risky behaviours among the youth. Some of the most telling markers of the socioeconomic status include the status of the family on the social ladder and the family resources. These factors were explored in the study by Hanson and Chen (2007). Using a sample of 113 youth, Hanson and Chen collected data on the social, economic status of the families as reported by the respondents and their tendencies towards substance abuse. Hanson and Chen found that the likelihood of engaging in the use and abuse of illicit substances was high among the teenagers from families with high socioeconomic status.

Hanson and Chen's (2007) findings showed that the financial wellbeing of a family has a predictive role on whether the teenagers in the family engage in the risk behaviour of use and abuse of substance abuse. The findings from this study have been contradicted by other researchers whose findings reported a higher likelihood of engaging in the use and abuse of substances among the youth from families in low socioeconomic settings. These findings were the basis on which Humensky (2010) based his study, in which he aimed to determine whether there was a higher likelihood for engaging in the use and abuse of illicit drugs by the youth from families with high socioeconomic status.

Humensky (2010) found that the use of marijuana, binge drinking, and cocaine was associated with the high parental educational achievements. The adolescents of parents who had a high income were also found to engage in more use of marijuana and binge drinking. Without disparaging earlier findings that the low socioeconomic status had a predictive role in the likelihood of engaging in use and abuse of illicit substances,

Humensky (2010) found that the adolescents of parents with a high socioeconomic status were also not protected from the predictive role of the factor.

There are various methodological aspects I considered for the current inquiry. While I cover many of these aspects in the next section, I will highlight some of the aspects such as the source of the dataset, the data collection method, and the analytical procedures to be used. The source of the national database used in the inquiry was SAMHSA. The data were collected in conjunction with the Center for Behavior Health Statistics during the NSDUH that was performed between 2014 and 2015.

The data were collected from young people aged between 12 years and 25 years. Data were also collected for the people aged more than 26 years. In the cohort of between 12 and 25 years, the subjects were divided into groups of between 12 and 17 years and 18 and 25 years. The data were sampled from 50 states in the United States of America as well as British Columbia. I analyzed the data in the national database using the Statistical Package for Social Sciences. However, the data platform and cleaning were done using Microsoft Excel. The Statistical Package for Social Sciences is the preferred software for the analysis of the data because it enables one to perform multiple regression to determine how multiple independent variables influence one dependent variable (Norris, Qureshi, Howitt, & Cramer, 2014).

I performed a multiple regression on the dataset for the various proxies that measure the dependent and independent variables. The regression outputs offered the

correlation coefficients that were interpreted to determine whether a linear relationship existed between the variables, the magnitude of any linear relationship determined to exist, and its direction. The regression output also contained the ANOVA statistic that helped determine the statistical significance of any linear relationship established between the two variables (Norris et al., 2014).

Limitations of the Study

The covariate variable used in the study was age. However, there were other variables that might influence the hypothesized relationship. Some of these variables included the social economic status of the youth and their families, the level of education of both the targeted group and their families, as well as race. The literature considered in this paper showed that these factors had a significant influence on the hypothesized relationship between the variables. For instance, Quitno (2003) reported that the youth who lived in the neighbourhoods in low socioeconomic areas had a higher propensity to engage in risky behaviours that involved the use and abuse of illicit drugs. Quitno explained that the propensity for risk behaviours in this environment was attributed to the enduring demographic characteristics such as parents who have had or still have issues and disorders related to illicit substances, the high rates of crime that characterize the neighbourhoods, and the single-parent families.

The genetic environment has also been shown to have an influence on the hypothesized relationship between variables, and as such, would have been an appropriate covariate variable. Meyers and Dick (2010) reported that many of the

disorders that the people who engage in the use and abuse of illicit drugs have are heritable. The implications of this argument are that some trends witnessed in the target group could be a product of the heritable behaviours from their parents. The genetic environment would also have constituted an appropriate covariate variable.

Hanson and Chen (2017) showed that the socioeconomic status of the families and the target group also had a confounding effect on the hypothesized relationship between the variables. The family resources and the place of the families on the social ladder are important markers of socioeconomic status. Families who enjoyed affluence and were high on the social ladder were shown to have the surplus income the youth might require to finance the risk behaviours. Hanson and Chen found that there was a higher propensity for the youth from affluent families to engage in the risk behaviour of use and abuse of illicit substances. The significance of this covariate variable was illustrated by Humensky (2010), who found that binge drinking, cocaine usage, and abuse, and smoking marijuana was common among the youth from families where the parents had high academic achievements.

Despite the appropriateness of these confounding variables, only age can be used in this study due to the nature of the national database chosen. The database contains data that is described using several variables. One of the variables in the database is drugs. Some of the drugs about which data were collected include marijuana, cocaine, heroin, tobacco, and alcohol. For these variables, the data were collected through different

permutations. For instance, the data on marijuana pertained to the use of the drug by the respondents in the past year, past month, and the first instance of use.

The only permutation used for cocaine and heroin was the use of the drug in the target audience in the past year. The database contains more permutations for use for alcohol. For instance, the database contains data on the dependence on alcohol within the past year. The data on alcohol also contained information on the development of a drinking disorder in the year before the national survey was performed. SAMHSA also collected data on the use of alcohol in the past month for all the participants and particularly for those participants aged between 12 years and 20 years.

In exploring the trends in the use of tobacco among the targeted population, SAMHSA collected data on the use of a product containing tobacco in the month before the national survey was performed. The SAMHSA also collected specific data on the use of cigarette products in the month before the national survey was performed.

In addition to drugs, mental health was also included as a variable in the database. SAMHSA used various variables in measuring the mental health of the targeted population. One of the proxies that SAMHSA used was the development of serious mental illness in the target population in the year leading to the national survey. SAMHSA used wider inclusion criteria and collected data for the development of any mental illness, serious or otherwise in the year before the national survey was performed. SAMHSA also explored the presence of suicidal ideation among the target population in

the year leading to the national survey. The final proxy on mental illness was the development of major depressive episodes in the target population in the year leading to the national survey.

The grouping of the data in the national database was done with respect to age. It is for this reason that I used ages as a covariate variable. In total, there were 15 groupings based on age. The number is inflated by the fact that the partial analysis that was performed before the database was published included a report of estimates, the lower estimate, and the upper estimate. The fact that the national database only uses age as the covariate variable was a limitation considering that part of the requirements was to use one national database that contained all the variables that are necessary for exploring the topic in-depth and answer the research questions comprehensively. It is for this reason that age was the sole covariate variable in the study. Future studies using secondary data should address this limitation to determine the influence of the other covariate variables discussed earlier.

Literature Review

Introduction

In addition to the theoretical basis, the inquiry also benefited from a review of existing literature. This exercise helped identify what is known as well as the gaps that exist in the literature. The identification of gaps is a prerequisite for the formulation of knowledge-based recommendations for other studies in the future. In this section, I

discuss the search strategy for the sources to be used in developing a literature review and the theoretical foundation on which the inquiry was based.

Literature Search Strategy

I performed the literature search on numerous databases. The search engines included PubMed, Google, NCBI, Google Scholar, Medline Plus, and PsychNet. Data from published reports from reliable government websites such as the National Institute of Mental Health and Centers for Disease Control and Prevention, as well as health organization websites were also included. The information gotten from these search engines was used in the literature review section. The relevant articles were retrieved through a combination of search words.

Some of the search words and phrases used in different permutations included *mental illnesses, suicidal ideation, depression, depressive episodes, nonmedical substances, illicit substances, substance use, substance abuse, association, regression, correlation,* and *relationship*. These search terms will be combined in different forms to yield topic sentences or phrases that will be input in the search engines to yield possible articles.

In terms of scope, the sources that were selected for the theoretical foundation and other sections of the dissertation included peer-reviewed articles, periodicals, articles from scholarly journals, articles published by relevant and credible organizations, books,

and credible electronic sources. The inclusion of articles that met that criteria helped ensure that the literature reviewed in this paper was varied and credible.

Theoretical Foundation for the Study

Various mechanisms can be cited to explain the linkage between the use and abuse of marijuana and alcohol and the comorbid occurrence of mental health issues. One of the mechanisms is the expectancy theory. For this study, I did not hypothesize a causal effect relationship between the two variables. Rather, the hypothesis was that the two variables are related in a linear manner where a change in one variable results in a change in another variable in a given direction and to a given magnitude. Considering this proposition, the expectancy theory is one of the mechanisms that offers an apt explanation of how the two variables relate.

The expectancy theory explains both the use and abuse of the nonmedical and illicit substances and the linkage between the use and abuse and the comorbidity of mental illnesses. One of the propositions of the expectancy theory is that people will understand the effect that a certain drug will have on them after consumption by observing its effects on other users of the drug (Pedersen et al., 2015). Using experimentation and by observing the effects of the drug on others, the individuals are also able to understand, reaffirm, or disprove the negative and positive beliefs regarding use and abuse of nonmedical and illicit substances (Pedersen et al., 2015).

There are apt examples that can illustrate the relationship described above. For instance, marijuana is the one illicit drug that is commonly used by adolescents and young adults in the United States (Pedersen et al., 2015). There are prevailing beliefs and attitudes regarding the use of the drug. For instance, some people believe that the use of the drug relaxes them. A young person who uses the drug with this belief is likely to experience a relaxed sensation. The said youth would likely affirm the belief through the results of experimentation and is, therefore, more likely to continue using the drug. Other young people are informed of the likelihood that the use of marijuana will diminish their cognitive functions and capabilities. The young people can collect data on this belief through observation or experimentation. If they determine that their cognitive functions are diminished by using the drug, they are more likely to halt the use of the drug to avoid any further negative consequences (Pedersen et al., 2015).

The expectancy theory can also be cited to explain the relationship between mental illnesses and the use and abuse of nonmedical and illicit substances. Researchers such as Low et al. (2012) have found that the beliefs surrounding the use of the drug play an important role. For instance, a young person who believes that the use of a drug such as marijuana will attenuate feelings such as social anxiety is likely to use the drug to help combat social anxiety. In this scenario, the use of the drug can be intermittent and predicted by situations where social anxiety is undesirable, such as when talking in public.

However, there is the risk that one can develop an addiction to the substance, especially because the therapeutic effect of the drug in combating the social anxiety is only as sustainable as the length of the effect of the drug on the human body. Low et al. (2012) reported that there is a higher likelihood for young people who are afflicted with stressful events to engage in the use of illicit substances. When asked, they attribute the use of the illicit substances such as marijuana on the need to attenuate the stress, depression, and anxiety with which they are afflicted (Bottorff, Johnson, Moffat, & Mulvogue, 2009).

The association of substance abuse and comorbidity of mental illnesses has been explored from the vantage point of the expectancy theory. Pedersen et al. (2015) argued that positive expectancies relating to the use of nonmedical and illicit substances are predictive factors for the consequences that ensue. The positive expectancies are that the use of the nonmedical and illicit substances will help to attenuate the stress and other mental health issues such as depression. Conversely, negative expectations result in the reduction of the risk. This often occurs when the young person is concerned that the use of nonmedical and illicit substances will diminish their cognitive capabilities and functions (Pedersen et al., 2015).

Using a sample of students from middle school, Clark, Ringwalt, and Shamblen (2011) found that the positive expectancies in the use of the nonmedical and illicit substances were associated with the use and abuse of these substances. Bickner and Schmidt (2008) explored a different perspective using a sample comprising of young

adults drawn from community and clinical settings. The researchers found that there was a positive association between the use of marijuana and the affliction of social anxiety.

This relationship indicated that young adults who had social anxieties were more likely than their counterparts without the affliction to use marijuana. With regards to the significance of the positive association found between the two variables, Bickner and Schmidt (2008) found that the association was stronger in young adults who had negative expectancies about the use of the drug. According to Pedersen et al. (2015), the negative expectancies in this context were that in using the drugs, they would diminish the mental capabilities and functions of the user.

The aptness of the expectancy theory in describing the association between the study variables has also been shown through the research performed by de Dios et al. (2010). The researchers in that study used a sample comprised entirely of young female subjects. The researchers explored how expectancies regarding the ability of a drug to help attenuate tension influenced the use of the drugs. They found that these expectancies were a significant predictor of the use of drugs such as marijuana and anxiety in the users (de Dios et al., 2010).

The expectancy theory described above explains why young people might engage in the use and abuse of nonmedical and illicit substances. The theory also explains the association that numerous researchers have reported between the use and abuse of nonmedical and illicit substances and the comorbidity of mental illnesses among the

study population. This theory informed the inquiry to an extent. More precisely, and because the study employed secondary data as will be discussed in Chapter 3, the knowledge gained from this theory will help in the identification of gaps in the existing literature, secondary data, and the current proposal as a prerequisite for making recommendations for future studies.

Kaminer et al. (2007) argued that in most occasions, adolescents who were diagnosed with different disorders relating to substance abuse were also found to have comorbid psychiatric disorders. This is an occurrence that is common among the adolescent population. For instance, Kaminer and Bukstein (2007) reported that between 70% and 80% of the clinical samples of adolescents who were diagnosed with different substance abuse disorders were also found to have comorbid psychiatric disorders, a phenomenon that is commonly referred to as dual diagnosis. While neither of the two articles explored the relationship between the two variables, it is noteworthy that the comorbidity of disorders that are related to substance abuse and mental health disorders has been reported.

The comorbidity of the two variables in the adolescent population has also been highlighted by the National Institute on Drug Abuse (2010). The corporate author found that different mental illnesses and disorders related to the use and abuse of nonmedical and illicit substances co-occur prevalently in the same individuals. The prevalence of the comorbidity of the conditions has been high enough to warrant inquiry from both federal organizations and players from academic realms. Deas (2006) also reported comorbidity,

arguing that the impact of the disorders related to the use and abuse of nonmedical and illicit substances is not just predicted by the fact that these disorders are prevalent among the adolescent population; the impact is also predicted by the fact that the disorders also co-occur with other psychiatric disorders (Deas, 2006).

The findings from the clinical study performed by Langas, Malt, and Opjordsmoen (2011) also contributed to the debate on the comorbidity of the disorders related to the use and abuse of nonmedical and illicit substances and mental illnesses. The researchers reported that the comorbidity was highly prevalent among the adolescent population. Similar findings had been reported by Roberts, Roberts, and Xing (2006), who argued that talks of mental illnesses were commonplace in any discussions relating to substance abuse among the adolescent population. The findings reported in the studies discussed above have a bearing on the proposed inquiry. It was noted earlier that while my purpose was to explore the association between mental illnesses and the use and abuse of nonmedical and illicit substances but not based on the need to establish causality.

This argument has been exemplified by National Institute on Drug Abuse (2010), who argued that the fact that comorbidity has been established through different studies is not an indication that there is a causality relationship between the two variables. While causality is not ruled out as an explanation for the comorbidity of the two variables, other scenarios have also been postulated as possible explanations for the comorbidity phenomenon. The first is a scenario where the drugs that are abused by the adolescents

cause them to develop or experience symptoms that are characteristic of different mental illnesses (National Institute on Drug Abuse, 2010). This is common among the people who abuse marijuana, as they have been found to have an increased risk of developing psychosis, a mental illness. In this scenario, the two conditions might occur in the same individual.

The second scenario is one where an adolescent result in using and abusing drugs courtesy of a mental illness with which they have been diagnosed (National Institute on Drug Abuse, 2010). It is not uncommon for individuals who are diagnosed with subclinical, overt, or mild forms of different mental disorders to use different drugs for the purposes of self-medication. This was explained at length by the expectancy theory, particularly, where positive expectancies are harboured in the way of attenuating the manifestations of the mental illness. For instance, patients who are diagnosed with schizophrenia are known to consume tobacco-based products based on the belief that they will attenuate the manifestations of the mental illness as well as to improve the cognitive functions (National Institute on Drug Abuse, 2010). The third scenario is one where overlapping factors including chronic stress, trauma, vulnerabilities in the genetics, and deficits in one's brain resulting in the development of mental illnesses as well as the use and abuse of nonmedical and illicit substances.

Even with the presence of different scenarios that might explain the comorbidity, an association between the dependent and independent variables has been established by different researchers. It is worth noting that there has not been a consensus regarding the

existence of a relationship between the two variables. Researchers have reported findings on either side of the divide. Harris and Edlund (2005) reported an association between the two variables. The vulnerability of the adolescence stage of development was cited as a contributing factor to the existence of the association.

Rao, Daley, and Hammen (2000) reported that it is during this period of development when there is the highest likelihood of developing the disorders that are related to both the use and abuse of nonmedical and illicit substances as well as mental illnesses. This finding is significant because it offers a foundation for the association between the two variables. Brook et al. (2002) argued that the teenagers who engage in the use and abuse of nonmedical and other illicit substances at this stage of development are more likely to develop depression later in the adolescence stage. This is an indication that a linear relationship exists between the two variables.

However, the findings of an association have been denied in other studies. For instance, Degenhardt, Hall, and Lynskey (2003) could not find that depression occurred comorbid with substance abuse when working with youth who reported to using marijuana. Curran, White, and Hansell (2000) also found that the increasing use of alcohol or other drugs was not significantly associated with symptoms of mental disorders such as anxiety or depression. Measelle et al. (2006) found that only a small association existed between mental illnesses such as anxiety and depression and the use and abuse of substances. The researchers further reported that the small relationship was

rendered statistically insignificant when the effect of the confounding variables was considered.

The American Adolescent

This is a diverse group that differs in many attributes. The following are some of the attributes that characterize the American adolescent.

Population growth. The American adolescent comprises a significant proportion of the total population in the country. Estimates by the Office of Adolescent Health (2016) estimates that there are 42 million adolescents in the United States, a number that represents 12% of the total population. The adolescent group as conceptualized by the Office of Adolescent Health comprises of the young people ranging from ages 10 to age 19. The number is projected to grow exponentially in the coming years. Figure 2 shows that at present, the adolescent population is estimated at 42 million. By 2050, the population is estimated to have increased to 45 million, a figure that will represent approximately 11.2% of the total population.

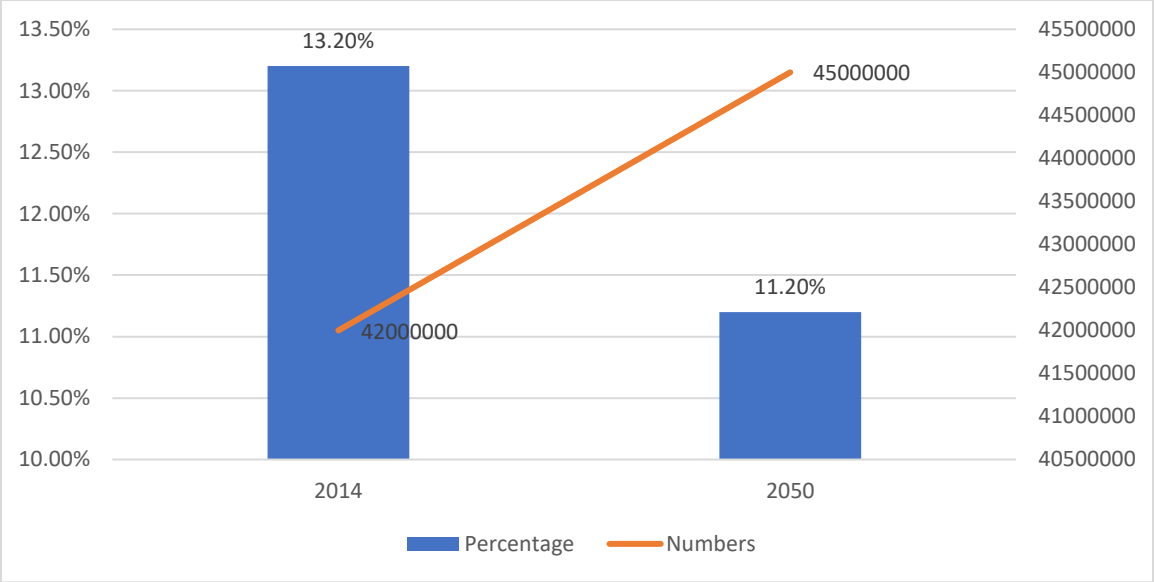

Figure 2. Projections on adolescent population. From the Office of Adolescent Health, 2016.

Age and gender. The diversity seen in this group is further predicted by age and gender as demographic attributes. Age is an important factor in the characterization of this population cohort because the factor predicts the engagement of members of the population cohort in risky behaviours. For instance, Centers for Disease Control and Prevention (2014) found that there is a higher likelihood for the adolescents aged between 15 years and 19 years to engage in risky behaviours such as the use and abuse of illicit substances and unsafe sexual practices when compared to the youth aged between 10 years and 14 years. In addition to age, gender also predicts the behaviour of the adolescents. For instance, there is a higher likelihood for the male adolescents to engage in risky behaviours when compared to the female adolescents. Centers for Disease

Control and Prevention (2014) found that there is a higher likelihood to engage in the use and abuse of illicit drugs such as alcohol and tobacco. Figure 3 shows that there is an equal divide between the adolescents in terms of age.

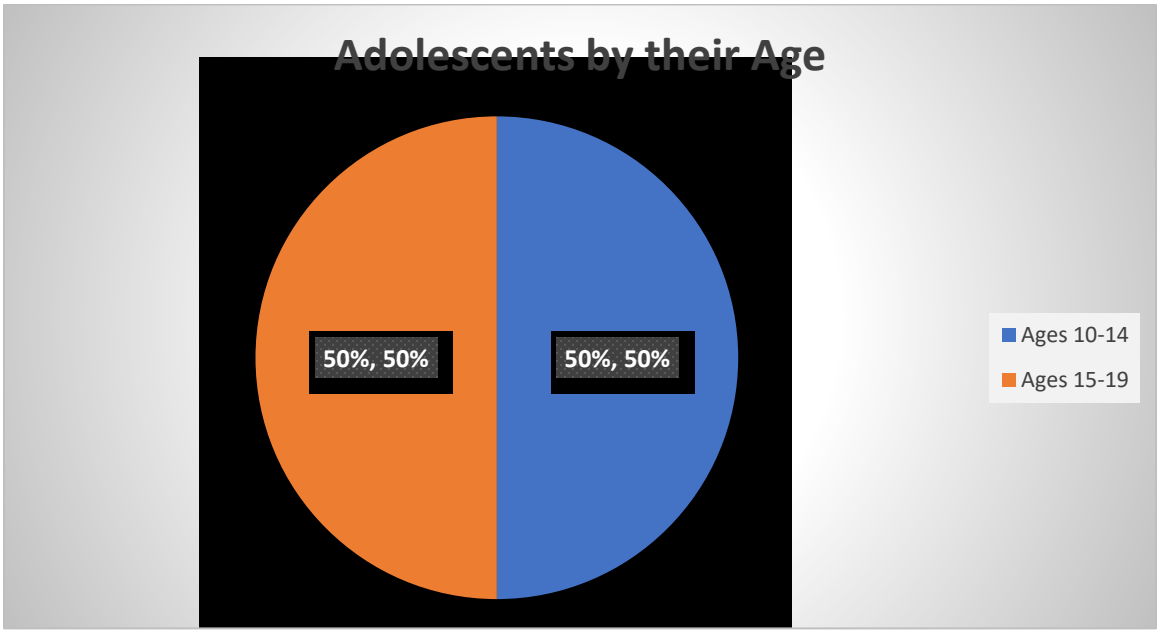

Figure 3. Classification of adolescents by their age. From the Office of Adolescent Health, 2016.

Figure 4 shows that there are more male adolescents (51%) compared to the female adolescent (49%).

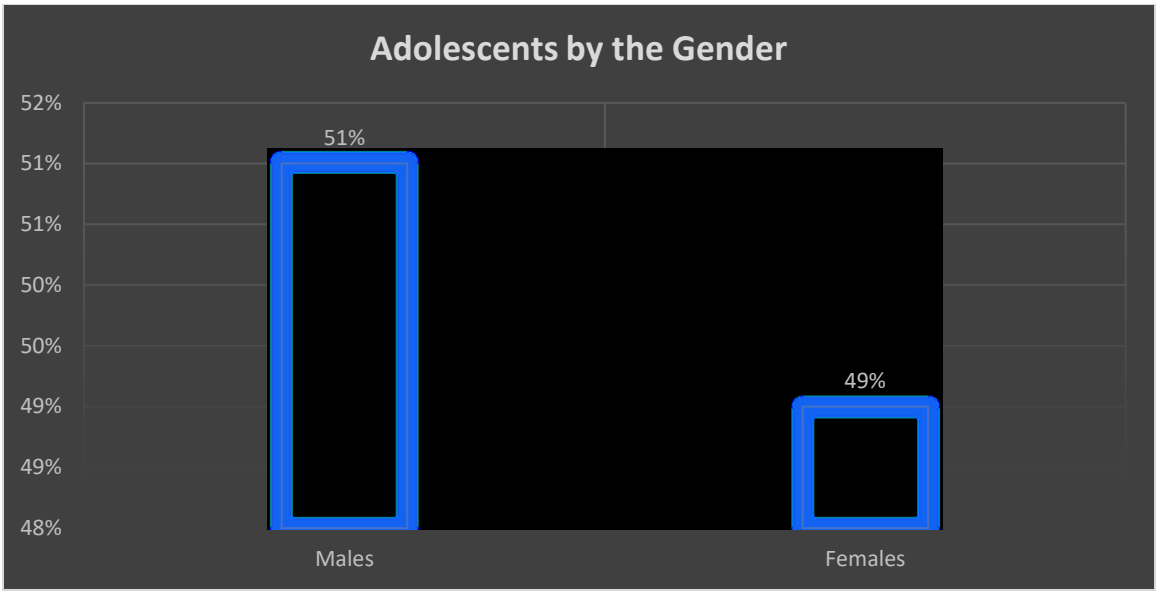

Figure 4. Classification of adolescents by their gender. From the Office of Adolescent Health, 2016.

Race and ethnicity. Race and ethnicity is another attribute that predicts the diversity of the American adolescent. Race and ethnicity are important descriptors of behaviour as found by the Centers for Disease Control and Prevention (2014). The health-seeking behaviours of the youth vary with their race and ethnicities. Race and ethnicity is also a predictor of the socioeconomic characteristics of the youth. For instance, the Agency for Healthcare Research and Quality (2012) reported that many of the youth in the minority races and ethnicities live in lower socioeconomic settings compared to the youth in the major races.

Figure 5 shows the proportion of the American adolescent from different ethnicities and the projections for the growth of the adolescents from the ethnicity by

2050. At present, 54.1% of the American adolescents are of the white descent. Although projections show that the proportion of the youth from this ethnicity will reduce to 40.3%, most of the adolescents at the time will still be of the white descent. The youth of the Hispanic descent comprise 22.8% of the total adolescent population. However, this number is projected to rise more significantly than that of the adolescents from other ethnicities to 31.2% by 2050. The African American ethnicity accounts for the third most number of adolescents in the United States with a proportion of 22.8%. This number is not projected to increase significantly by 2050 as evidenced by a reduction of 0.9% to 13.1%.

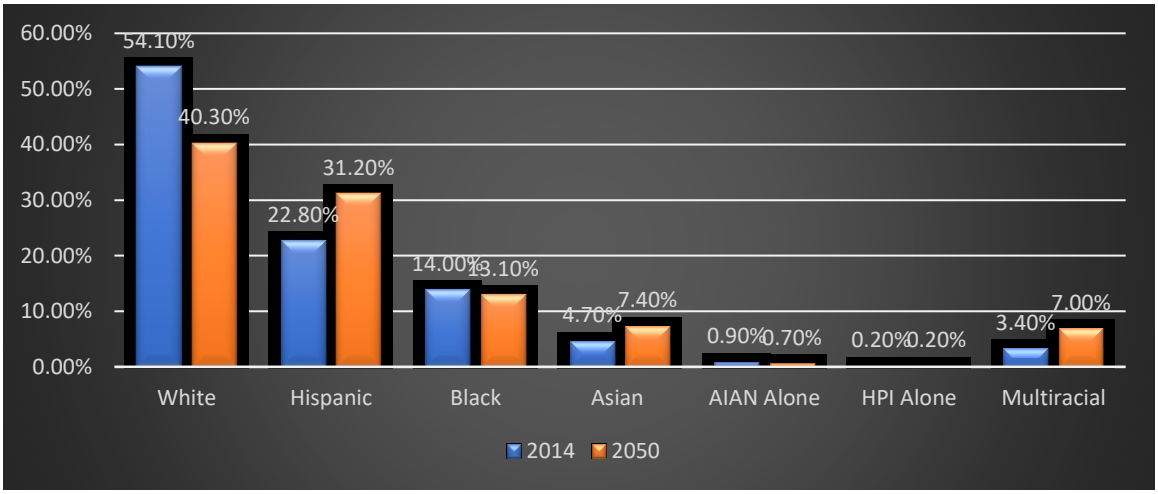

Figure 5. Classification of the adolescents by race and ethnicity. From the Office of Adolescent Health, 2016.

Socioeconomic status. The socioeconomic status is a predictor of the behaviour of adolescents. The ability to finance leisure activities has an influence on the engagement in risky behaviours. Blackwell (2010) reported that poverty is especially

significant for the youth raised in single-parent families. The significance of socioeconomic status was modelled by Pampel, Kreueger & Denney (2010) in a study where he found that there was a higher likelihood for adolescents from low socioeconomic settings to partake in risk behaviours such as smoking and to also experience emotional problems when compared to youth from high socioeconomic settings.

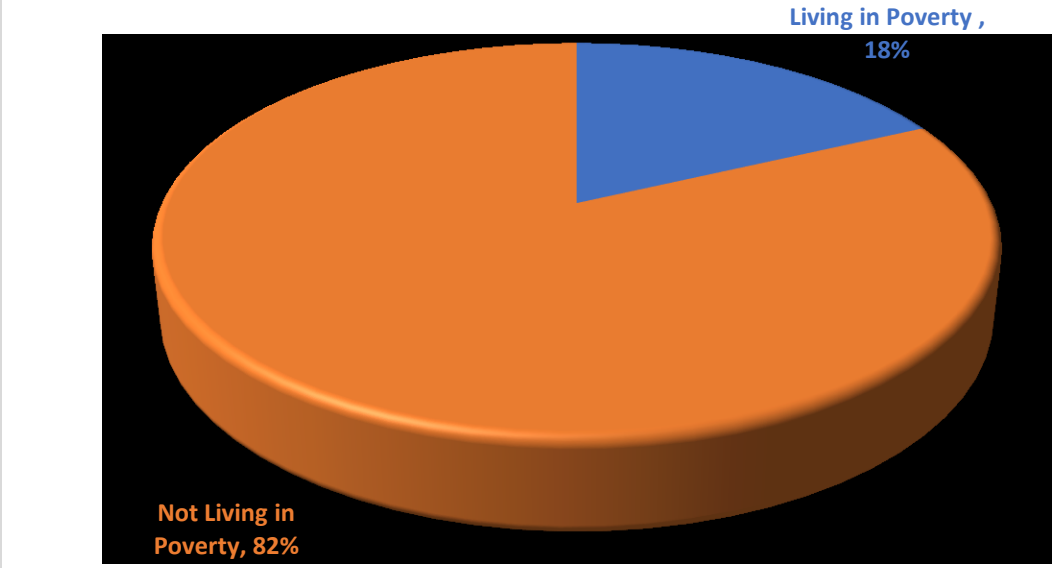

Figure 6. Poverty statistics of the American adolescents. From "Current Population Survey, Annual Social and Economic Supplement, 2014," by the U.S. Census Bureau, 2014 (http://www.census.gov/cps/data/cpstablecreator.html).

The population survey that was performed by the U.S. Census Bureau (2014) found that a significant 18% of the adolescent population in the United States were living in low socioeconomic settings. This classification was based on the Federal Poverty Line

which is determined at a family consisting of four household members earning an annual income amounting to 24,250 dollars.

Geographical location. The location where the adolescents in the United States live is also another factor that predicts their diversity. The Office of Adolescent Health (2016) also found that this factor is a significant predictor of behaviour because of different exposures that different locations given the adolescents. Exposures affect the socialization of the adolescents. For instance, the U.S. Department of Health and Human Services (2011) reported that the youth living in urban areas have a higher likelihood to access social amenities such as playgrounds and recreational parks. Samson et al., (1999) had reported that social control is an important aspect of the influence of the environment on the behaviour of adolescents.

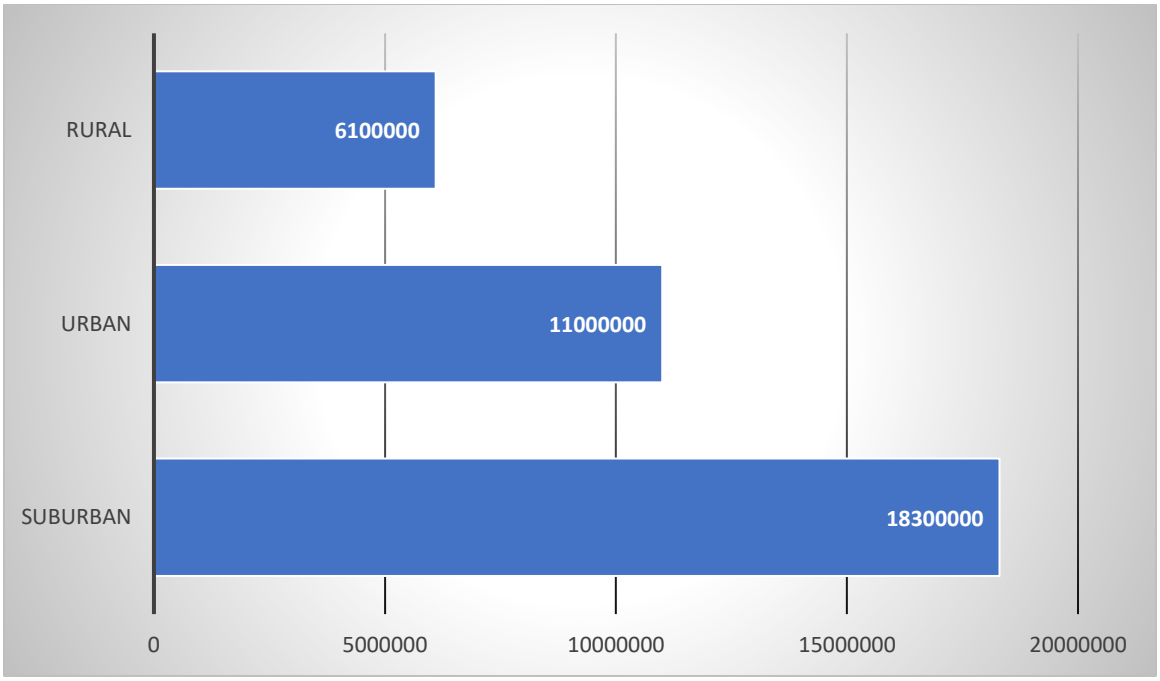

Figure 7. Geographical location in which the American adolescents live. From "Current Population Survey, Annual Social and Economic Supplement, 2014," by the U.S. Census Bureau, 2014 (http://www.census.gov/cps/data/cpstablecreator.html).

In the population survey performed by the U.S. Census Bureau (2014), 18.3 million adolescents in America were living in suburban areas. These are the areas in the periphery of the city in a metropolitan area. U.S. Census Bureau (2014) also found that another 11 million American adolescents lived in urban areas. These are the youth who live in the cities of a metropolitan area. The number of the youth who lived in the rural areas of the United States according to U.S. Census Bureau (2014) was 6.1 million adolescents.

Prevalence of Use and Abuse of Marijuana and Alcohol

Prevalence of use and abuse of marijuana. The data on the prevalence of use and abuse is available both at the state and national level. Arguably, the data at the state level is aggregated to form national-level data. Figure 8 shows the prevalence of use of marijuana in the past month in the target population in different states. The data shows that the lowest prevalence was noted in Alabama with a rate of 4.98% while the highest rates were noted in Colorado where the rate of use in the past month was noted at 12.56% (Hughes, Lipari & Williams, 2015).

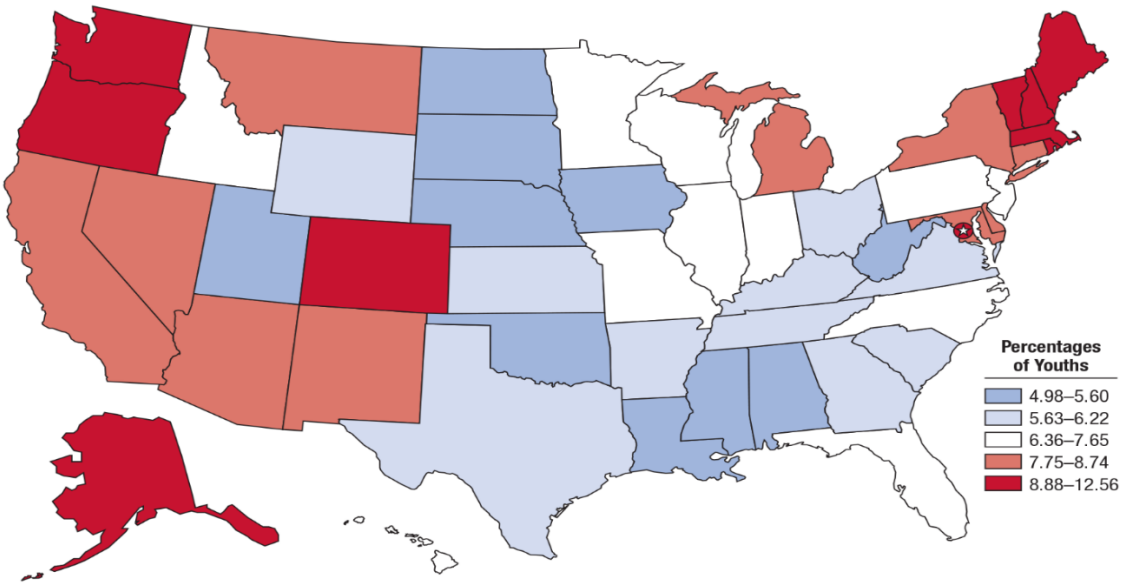

Figure 8. Percentage of adolescents between 12 and 17 years who used marijuana in the past month between 2013 and 2014. From "State Estimates of Adolescent Marijuana Use and Perceptions Of Risk Of Harm From Marijuana Use: 2013 And 2014," by A. Hughes, R. Lipari, and M. Williams, 2015 (https://www.samhsa.gov/data/sites/default/files/report_2121/ShortReport- 2121.html).

Table 1 shows that the prevalence rate at the national level remained relatively constant between 2013 to 2014 and 2014 to 2015. However, the rates in states such as Delaware Colorado, Arizona, and Hawaii among others reduced. The data also shows that the prevalence rates in states such as Alaska, Georgia, Montana, and Massachusetts among others increased. Comparing the state-level data with the prevalence rate at the national level can help show the states in which the prevalence rates are higher than the rate reported at the national level. This information is important in the planning and evaluation of new and existing interventions respectively. This information can be used by health agencies at the state level to justify increased investment in preventive-based interventions to reduce both the incidence and prevalence rates.

Table 1

The Rate of Use of Marijuana Among Adolescents Aged Between 12 Years and 17 Years in the Last Month by State

State	12-17 (2013-2014)	12-17 (2014-2015)
The total U.S.	7.22	7.2
Alabama	4.98	5.16
Alaska	9.19	10.64
Arizona	8.3	7.71
Arkansas	6.22	6.46
California	8.74	8.32
Colorado	12.56	11.13
Connecticut	7.91	8.34
Delaware	8.22	7.42
District of Columbia	10.56	8.85
Florida	7.51	6.78
Georgia	6.06	6.92
Hawaii	7.65[b]	6.15

Idaho	6.39	6.51
Illinois	6.75	6.55
Indiana	6.52[b]	8.08
Iowa	5.17	5.3
Kansas	5.85	6.43
Kentucky	5.63	6.36
Louisiana	5.55	5.33

(table continues)

State	12-17 (2013-2014)	12-17 (2014-2015)
Maine	9.9	10.01
Maryland	8.05	9.2
Massachusetts	8.88	9.22
Michigan	8.09	8.06
Minnesota	6.75	6.21
Mississippi	5.6	5.29
Missouri	6.45	6.56
Montana	8.3	8.71
Nebraska	5.54	5.26
Nevada	7.97	7.39
New Hampshire	9.83	9.44
New Jersey	6.36	6.81
New Mexico	7.98	8.53

New York	7.75	7.55
North Carolina	6.51	5.97
North Dakota	5.6	6.21
Ohio	6.04	6.05
Oklahoma	5.52	5.42
Oregon	10.19	9.42
Pennsylvania	7	6.98
Rhode Island	10.69	10.19
South Carolina	6.16	6.57
South Dakota	5.32	6.43

(table continues)

State	12-17 (2013-2014)	12-17 (2014-2015)
Tennessee	5.7	5.9
Texas	6.12	6.86
Utah	5.42	4.54
Vermont	11.4	10.86
Virginia	5.89	5.44
Washington	10.06	9.17
West Virginia	5.6	6.05
Wisconsin	7.18	7.6
Wyoming	6.19	6.59

Note. From (SAMHSA, 2015).

Prevalence of use and abuse of alcohol. The number of adolescents who consumed alcohol in the month prior to the administration of the national survey by SAMHSA (2015) between 2013 and 2015 and 2014 and 2015 was 11.55% and 10.58% respectively Source: (SAMHSA, 2015). In the same fashion with the trends on the use

and abuse of marijuana, some states such as Delaware, California, Florida, Colorado, and Maine had prevalence rates that were higher than the national averages. The prevalence rate in other states such as Arkansas, Alabama, Texas, and West Virginia among others were lower than the national averages Source: (SAMHSA, 2015). The information yielded from the comparison of state-level data, and national-level data can help identify the states in which more interventions focused on prevention are required.

Table 2

The Rate of Use of Alcohol Among Adolescents Aged Between 12 Years and 17 Years in the Last Month by State

State	12-17 (2013-2014)	12-17 (2014-2015)
The total U.S.	11.55[a]	10.58
Alabama	10.53[a]	8.76
Alaska	9.22	11.04
Arizona	11.90[b]	10.45
Arkansas	9.9	9.34
California	12.01[b]	10.92
Colorado	14.25	12.55
Connecticut	12.77	13.61
Delaware	10.61	10.36
District of Columbia	12.63	13.18
Florida	12.26[a]	10.72
Georgia	10.60[a]	8.93
Hawaii	11.2	10.55

Idaho	10.79	10.25
Illinois	10.98[b]	9.88
Indiana	11.44	10.06
Iowa	10.81	10.16
Kansas	11.18	10.45
Kentucky	9.02	8.24
Louisiana	12.35	10.75

(table continues)

State	12-17 (2013-2014)	12-17 (2014-2015)
Maine	11.86	12.47
Maryland	12.54	12.09
Massachusetts	13.3	12.21
Michigan	11.56	10.69
Minnesota	10.67	10.71
Mississippi	9.81	8.78
Missouri	10.91	9.83
Montana	11.19	9.9
Nebraska	10.53[b]	8.88
Nevada	13.59	13.67
New Hampshire	14.63	13.12
New Jersey	14.31	13.88
New Mexico	9.71	9.4

New York	12.86	12.57
North Carolina	10.17[a]	8.19
North Dakota	10.92	11.85
Ohio	11.01	10.33
Oklahoma	10.89	10.22
Oregon	12.92	11.68
Pennsylvania	12.87[a]	11.34
Rhode Island	13.21	13.23
South Carolina	9.63	8.87
South Dakota	9.29	10.38

(table continues)

State	12-17 (2013-2014)	12-17 (2014-2015)
Tennessee	9.35	8.17
Texas	10.81	9.96
Utah	6.76[b]	5.44
Vermont	13.76	13.16
Virginia	11.2	10.65
Washington	10.44	10.65
West Virginia	9.67	9.97
Wisconsin	14.02[a]	11.25
Wyoming	10.6	10.72

Note. From: (SAMHSA, 2015).

Conceptual Definitions

The following terms are used operationally in this study:

Mental illnesses: While mental illness assumes different meanings in different scenarios, the term is operationally defined as a serious mental illness in the past year, any mental illness in the past year, serious thoughts of suicide in the past year, and a major depressive episode in the past year.

Depression: Long-lasting periods of time with endless bad mood, feelings of hopelessness, and a lack of satisfaction (Mutrie, 2000).

Adolescents: Young people aged 12 to 17 years.

Substance abuse: When used in some areas, this term is operationally defined to mean the use and abuse of alcohol and marijuana.

Nonmedical and illicit substances: These terms are operationally defined to include the illegal drugs such as methamphetamines.

Assumptions and Limitations

The hypothesized association between the two variables may be hindered by other confounding variables that may not be analyzed in this study because of the nature of the dataset available. This is also a trend in the existing literature where other factors such a gender, socioeconomic status, and other similar variables have not been explored for an influencing role in the relationship between the dependent and independent variable.

Scope and Delimitations

The study will be narrowed to include only American children ages 12 to 17 years participating in studies published in credible journals within the last 17 years.

Significance of the Study

The study is significant because it advances the knowledge in an area of concern for public health, and where evidence-based solutions are required to remedy the prevailing trends. National Alliance on Mental Illness (n.d.) reported that 20% of the adolescents in the age bracket of between 13 years and 18 years have one at least one form of mental illness. Mood disorders are present among 11% of the youth in the same age group. Another 8% of the adolescents in the same age bracket are diagnosed with an anxiety disorder (National Alliance on Mental Illness, n.d.).

When considered in the context of the fact that suicide is ranked third on the list of the causes of mortalities for the people in this population, it is important to explore the influence of substance abuse as a contributing factor, especially because disorders related to substance abuse have been found to be comorbid, and that a linear relationship has been reported by numerous researchers. The findings are significant because they will contribute to the existing knowledge, particularly from a dataset that reflects a national outlook.

The study will also fill the existing gap of a lack of comprehensive knowledge on the comparison between state-level statistics on incidence and prevalence with the

national levels to identify the regions where the two problems exceed the national averages. This information will help underscore the need for more efforts in these regions. This contribution in knowledge will also help highlight the importance of state-level data in evaluating the progress made through the various programs aimed at reducing the prevalence of the drug issues and the comorbid conditions.

Implications for Social Change

The findings of this study are of significance to social change. Social change in this instance relates to the reduction of the incidence and prevalence of both substances abuse as well as mental illnesses in the adolescent population. Any interventions aimed at achieving this feat should be informed by an understanding of whether there is an association between the two variables. This is important because it will inform the decisions to create individual interventions or whether to address the two issues together.

The implications for social change stemming from the proposed study are both direct and indirect. From an indirect perspective, a finding of an association between the two variables would be a basis for inquiries exploring the possibility of a causality relationship between the variables. Even without further inquiry, a finding of a linear relationship between the two variables would mean that any interventions aiming at reducing the incidence and prevalence of mental illnesses among the adolescent population in the United States should also incorporate aspects aimed at addressing substance abuse as an associated factor.

Summary

It has been demonstrated through the literature reviewed that the prevalence of substance abuse and that of mental illnesses among the adolescent generation is undesirably high. It has also been demonstrated that the two conditions are comorbid with many of the youth who have one of the disorders likely to have the other at the time or in the future. The societal and health impacts of the disorders are significant, and a justification for any interventions aimed at reducing the prevalence. The reviewed literature has also shown that an association exists between the two variables. The expectancy theory adduced earlier helped explain why the association might exist between the two variables. Even though this finding has been challenged in other studies, the number of studies that have reported an association and the fact that there are many confounding variables and issues with sample and sample size warrants further inquiry into the association between the variables. As shown above, the matter is of significance, and it has implications for social change.

Section 2: Research Design and Data Collection

Introduction

This section details the methods that were used in answering the research questions. Among others, the section includes the research design and its justification, the study population, research questions, and the hypotheses, the data methods, data analysis plan, and the ethical considerations I made as the researcher.

Research Design and Rationale

The research design was quantitative with the research method as a collection of secondary research data. The regression data analysis was conducted using the Statistical Package for Social Sciences. The implications for social change are to contribute and promote research into the dynamic between marijuana and alcohol use and the occurrence of mental illnesses among the adolescents aged between 12 to 17 years. The research study was centered on quantitative research to understand the association between substance use and mental illnesses among youth in the United States.

Research Questions and Hypothesis

1. What is the association between the use and abuse of alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States?

2. What is the difference between the use and abuse of alcohol and marijuana and mental illnesses at the state level and at the national level?

$H_0$1: There is no statistically significant association between the use and abuse of. alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States

H_a1: There is a statistically significant association between the use and abuse of alcohol and marijuana and mental illnesses among the youth aged between 12 and 17 years in the United States.

$H_0$2: There is no statistically significant difference between state-level data and the national averages on the use and abuse of alcohol and marijuana and on mental illnesses among the youth aged between 12 and 17 years in the United States.

H_a2: There is a statistically significant difference between state-level data and the national averages on the use and abuse of alcohol and marijuana on mental illnesses among the youth aged between 12 and 17 years in the United States.

Study Population

The study population included American adolescents aged 12 to 17. The youth were sampled through a national survey that drew participants from 50 states as well as the District of Columbia.

Data Methods

The inquiry was quantitative in nature and used secondary data. The dataset was used to evaluate the association between substance abuse and mental illness among youth in the United States. After the verification of the entries in Microsoft Excel, I created a

data analysis platform on the Statistical Software for Social Sciences, the software that was employed in the manipulation of data. This was done by coding the entries into the entry as a prerequisite for the entry of the data from the individual states, and for each of the proxies used to measure both the dependent and independent variable. The final data analysis platform was also inspected for missing figures and to ensure that all the coding and entry of the values from the individual states and for all proxies that are used to measure the dependent and independent variable.

Variables

The independent variable used was the use and abuse of alcohol and marijuana while the dependent variable was mental illnesses. The covariate variable is the age groups into which the subjects are categorized. While there are other covariate variables affecting the hypothesized association, there were limitations in the number of variables measured in the national database, a fact that has been noted as one of the limitations of the study.

Data Analysis Plan

As highlighted earlier, the manipulation of data was done using both Microsoft Excel and the Statistical Package for Social Sciences. Microsoft Excel was used in the cleaning and verification of the data while the actual manipulation of the data was done on the platform created in the Statistical Package for Social Sciences. The analysis used both descriptive and inferential statistics. Measures of central tendency were employed to describe the prevalence rate of the dependent and independent variables using data from

the proxies used to measure them. Some of the measures of central tendency that I employed included mean and standard deviation. The means for each of the proxies were compared at the state level using the *t*-test to determine whether any differences in prevalence and incidence rate where applicable are statistically significant.

The association between the variables was measured using multiple regression tests. Of note is the fact that the dependent variable was measured using four proxies. It was important for me to determine the proportion of the changes in each of the four proxies of the dependent variable that is attributable to the different proxies of the independent variable. To enable the determination, each of the proxies for mental illnesses was included as the dependent variable in a multiple regression test where all the proxies for the independent variable were included in the model. This was done for each of the proxies of the dependent variable to ensure that the influence of the independent variables on the individual proxies of the dependent variable is determined empirically.

Threats to Validity

Brown (2006) present five criteria to determine the validity of a literature review: (a) purpose, (b) scope, (c) authority, (d) audience, and (e) format. These criteria were used to ensure the validity of this study. However, the considerations for internal and external validity were not limited to the literature review section. The consideration of the threats to validity also consider the research methods employed in the study. One of the considerations that were implemented to ensure the external validity of the proposed study is choosing a database that features high-quality data. According to Koziol and

Arthur (2011), studies that are sponsored by either the national or federal governments through its agencies are more likely to include large sample sizes because of the availability of resources such as human, time, and financial.

The effect of the large sample sizes in such studies is that the samples are more representative of the population that is targeted in the study when compared to privately funded studies. The increased representativeness enhances the external validity of the study and the data used (Koziol & Arthur, 2011). It was for this reason that a choice was made to use the database maintained by SAMHSA. The data contained in this database paint both a state-level and national-level picture of the prevalence of use and abuse of marijuana and alcohol, the two drugs included as independent variables for the targeted group. The internal validity was addressed by controlling the covariate variables that might influence the findings of the proposed study.

Ethical Considerations

Considering that the inquiry used secondary data collected from participants all over the country and aggregated at the state level, informed consent or the consideration for the confidentiality of the human subjects from whom the data were collected was not necessary. Nonetheless, I had the responsibility as the researcher to ensure that ethical practices were entrenched in the research processes. Firstly, I sought the written permission of SAMHSA to use the data collected in their database for the purposes of the inquiry. I also complied with the requests and demands made by SAMHSA as a prerequisite for the permission to use the secondary data. Secondly, I sought the approval

of the Institutional Review Board of Walden University on the proposal and the use of secondary data for the research exercise.

Summary

The inquiry and the research questions, objectives, and hypotheses will be addressed using quantitative methods and secondary data. The data are contained in a database that was developed following a national survey performed by SAMHSA. The study population is the American youth, particularly, adolescents aged between 12 and 17 years. The association between variables will be determined by performing multiple regressions on the dataset. The regression test enabled me to determine the correlation coefficient and the direction and magnitude of any linear relationship between the variables.

Section 3: Presentation of the Results and Findings

Results

Marijuana Use in the Past Month

One of the proxies that were used to measure the use and abuse of marijuana was the use of the drug in the past month. The prevalence rate at the national level for the use of the drug in the past month averaged 7.20% with a range of between 6.86% and 7.56%. The average prevalence rate for this proxy for 29 states was lower than the national average as shown in Table 3. The state with the lowest prevalence for adolescents using marijuana in the past month was Utah at an average of 4.54% and a range of 3.43% to 5.99%. The states in which the average prevalence rate was lower than the national average of 7.20% included Utah, Alabama, Nebraska, Mississippi, Iowa, Louisiana, Oklahoma, Virginia, Tennessee, North Carolina, Ohio, West Virginia, Hawaii, North Dakota, Minnesota, Kentucky, South Dakota, Kansas, Arkansas, Idaho, Illinois, Missouri, South Carolina, Wyoming, Florida, New Jersey, Texas, Georgia, and Pennsylvania in an ascending order. The state averages and ranges can be found in Table A1.

Table 3

Summary of the Descriptive Statistics

Proxy	National Prevalence /Incidence rate	Highest Prevalence/Incidence rate		Lowest Prevalence/ Incidence rate	
		State	Rate	State	Rate
Marijuana use in the past month	7.20%	Utah	4.54%	Colorado	11.13%
The first use of marijuana	5.41%	Utah	3.05%	District of Columbia	8.26%
Alcohol use in the past month	10.58%	Utah	5.44%	New Jersey	13.88%
Alcohol use disorder in the past year	2.62%	North Carolina	2.08%	New Jersey	3.24%
Alcohol dependence in the past year	0.95%	Maryland and Tennessee	0.79%	New Mexico	1.23%
Major depressive episode in the past year	11.93%	Hawaii	9.87%	Indiana	14.64%

There were other states in which the average prevalence of marijuana use in the past month by the adolescents was higher than the national average of 7.20%. There were 22 of these states namely Nevada, Delaware, New York, Wisconsin, Arizona, Michigan, Indiana, California, Connecticut, New Mexico, Montana, District of Columbia, Washington, Maryland, Massachusetts, Oregon, New Hampshire, Maine, Rhode Island,

Alaska, Vermont and Colorado in an ascending order. The state in which there was the highest use of marijuana in the past month was Colorado, with a state average of 11.13% and a range of between 9.02% and 13.65% as shown in Table 3. The prevalence and range for these states are also illustrated in Table A1

Using the Statistical Package for Social Sciences, a one-sample test was performed to determine whether there was a statistically significant difference in the prevalence for the various states and against the national average. There was no hypothesized mean difference when comparing the state average hence the use of 0 as the test value. Table 4 shows that there was a statistically significant difference in the averages for various states ($p < 0.005$). This finding was consistent with the large range exhibited in the prevalence rates at the state level as illustrated in Table 3 with Utah reporting the lowest average at 4.54% and Colorado the highest average at 11.13%.

Table 4

Summary of the Outputs for the One-Sample t-Test

	One test sample for various states			One test sample against national prevalence/incidence rate		
	t	df	p-value	t	df	p-value
Marijuana use in the past month	32.248	51	.000	.492	51	.625
First use of marijuana	37.358	51	.000	-1.184	51	.242
Alcohol use in the past month	46.267	51	.000	.419	51	.677
Alcohol use disorder in the past year	63.218	51	.000	-.313	51	.756
Alcohol dependence in the past year	68.977	51	.000	-1.972	51	.054
Major depressive episode in the past year	76.269	51	.000	.250	51	.803

When a one-sample test was performed to compare the national prevalence rate with the average of the prevalence rate of various states using the national average as the test value as shown in Table 4, a *p*-value of .625 showed that the state averages do not vary significantly from the national average.

First Use of Marijuana

While the previous proxy focused on the prevalence rate for the use of marijuana in the past month, this proxy explored the incidence rate of the drug. The incidence rate at

the national level was 5.41% with a range of between 5.17% and 5.65% as shown in Table 3. Utah also reported the lowest incidence rate of marijuana use at 3.05% with a range of between 2.41% and 3.86%. Twenty-three states had an incidence rate that was lower than the national average of 5.41%. The list of these states is presented in Table A4. The incidence rate for the use of marijuana in 28 states was higher than the national average of 5.41% as reported in Table A4.

In similar fashion with the previous proxy, a one-sample test did not show a statistically significant difference between the incidence rate at the national level and the average incidence rate for all the states ($p > 0.242$) as shown in Table 4. However, the range of the incidence rates at the state level showed the extent to which this finding can be relied upon when comparing state-level and national-level data.

A one-sample test of the state level incidence rate showed that the incidence rate for marijuana use among the adolescents varied significantly from one state to another ($p < 0.05$) as shown in Table 4. The finding of a statistical significance in the variance in the first use of marijuana at the state level as shown in Table 4 was vindicated considering the wide range given by the lowest incidence rate reported in Utah at 3.05% and the highest incidence rate in District of Columbia at 8.26% as shown in Table 3.

Alcohol Use in the Past Month

In addition to marijuana, alcohol is the other drug on which the current study focused. One of the proxies used to measure this drug was its use in the past month. It

was worth noting that in similar fashion with the two previous proxies for marijuana use, Utah also had the lowest prevalence for the use of alcohol in the past month for the population targeted in the study at a rate of 5.44% and a range of 2.98% and 7.40%. The highest prevalence for the use of the drug in the past month by the adolescents was in New Jersey were an average of 13.88% of the adolescents in the state consumed the drug in the past month with a range of between 11.77% and 16.29% as illustrated in Table 3. The national prevalence rate for the use of alcohol in the past month was 10.58% with a range of between 10.15% and 11.02%. The number of states for which their prevalence rate was higher than the national average was 25 as shown in Table A7. Another 26 states reported a prevalence rate that was lower than the national average as illustrated in Table A7.

A one-sample test comparing the difference in the state level prevalence showed that there was a statistically significant variation in the means ($p < 0.05$) as shown in Table 4. This finding was vindicated by the finding of a large range between the lowest prevalence in Utah at 5.44% and the highest prevalence for the use of the drug in the past month on New Jersey at 13.88% as shown in Table 3. When the one-sample test for the state data was performed with the national average used at the test value was performed, the outcome showed that the average of the prevalence for the states did not differ significantly from the national average ($p > 0.05$) as shown in Table 4.

Alcohol Use Disorder in the Past Year

It is likely that the sustained use of alcohol can lead to the development of alcohol use disorders. It is for this reason that this proxy was introduced to help assess the occurrence of the alcohol use disorders among the adolescent population in the past year. Evidently, these disorders occurred in an average of 2.62% of the adolescent population nationally. However, there was a range of between 2.40% and 2.85% as illustrated in Table A10.

For the first time, Utah did not report the lowest prevalence rate for the proxies reported in this study. In its place, North Carolina reported the lowest prevalence rate of youths reporting with an alcohol use disorder in the past year with a rate of 2.08% and a range of between 1.53% and 2.82%. The state in which the highest prevalence was reported was in New Jersey with a prevalence rate of 3.24% and a range of between 2.38% and 4.41% as illustrated in Table 3. The prevalence rate in 28 states was lower than the national average of 2.62% while 23 states reported a prevalence rate that was higher than the national average as shown in Table 3.

A one-sample test for the occurrence of alcohol use disorders showed that the prevalence rates for the various states with regards to the occurrence of alcohol use disorders in the past year differed in a statistically significant manner ($p < 0.05$) as shown in Table 4. When the average prevalence for the various states was compared with the national average in a one-sample test using the national average as the test value showed

that the state averages did not vary in a statistically significant manner from the national averages as shown in Table 4.

Alcohol Dependence in the Past Year

The occurrence of alcohol dependence in people might precipitate the development of alcohol dependence. This proxy was used to help assess the prevalence of alcohol dependence in the year preceding the study. As shown in Table 3, the national prevalence rate for the adolescent population was 0.95%. The states in which the lowest prevalence was reported were Maryland and Tennessee with the rates at 0.79% as shown in Table 3. The highest prevalence rate for this proxy was reported in New Mexico where the rate was at 1.23%. The prevalence rate in 31 states was lower than the national average of 0.95%. The prevalence rate in five states equalled the national average of 0.95% while the prevalence rate in 16 states was higher than the national average of 0.95%.

A one-sample test comparing the state averages showed that there was a significant variation in the individual prevalence rates as shown in Table 3. Again, this finding was vindicated by the range of 0.79% for the lowest prevalence rate and 1.23% for the highest prevalence rate. A one-sample test in which the average of the prevalence rates for the states was compared with the national average that was used as the test value showed that the state averages did not differ significantly with the national average (p = 0.05) as shown in Table 4.

Major Depressive Episode in the Past Year

One of the hypotheses in the study was the occurrence of mental illnesses among the adolescents in the United States was associated with the use and abuse of marijuana and alcohol. This proxy was used to measure the prevalence of mental illnesses in the study population. Table 3 shows that the national prevalence rate was 11.93% with a range of between 11.48% and 12.40%. The state in which the lowest prevalence rate was reported was Hawaii in which the rate was 9.87% and a range of between 7.95% and 12.17%. The highest prevalence rate was reported in Indiana where the rate was 14.64% and a range of between 12.29% and 17.34%. The prevalence rates in 24 states were higher than the national average while the prevalence rates in 27 states were lower than the national average.

A one-sample test comparing the prevalence rate of major depressive episodes for adolescents in the United States showed that the prevalence rates varied from one state to another in a statistically significant manner ($p < 0.05$) as shown in Table 4. When a one-sample test was performed with the national average as the test value, the findings reported in Table 4 showed that in keeping with previous trends, the average of the state level prevalence rates does not vary in a statistically significant manner from the national average ($p > 0.05$).

Association Between Alcohol and Marijuana Use and Mental Illness Among American Adolescents

The study aimed to determine whether there was an association between the use and abuse of marijuana and alcohol and the occurrence of the mental illnesses in the American adolescents. Table 5 shows the results of the Pearson correlation function to show whether there is a linear relationship between the proxies for the independent variable and dependent variable. The coefficient for the correlation between marijuana use in the past month and major depressive episode in the past year is 0.323. Although this is a weak positive correlation, a *p*-value of 0.01 shows that it is statistically significant as shown in Table 5. The coefficient for the correlation between the first use of marijuana and major depressive episode in the past year is 0.298 as shown in Table 5. While this also points to a weak positive relationship between the two variables, a *p*-value of 0.016 shows that the association of statistical significance.

Table 5

Correlation Coefficients for Dependent and Independent Variable

Proxies	Correlation Coefficient	P-value
Marijuana use in the past month	0.323	0.010
First use of marijuana	0.298	0.016
Alcohol use in the past month	0.176	0.105
Alcohol use disorder in the past year	0.398	0.002
Alcohol dependence in the past year	0.413	0.001

The Pearson correlation coefficient for the association between alcohol use in the past month and the occurrence of a major depressive episode in the past year was 0.176 as shown in Table 5. This was another indicator of a weak but positive linear relationship between the two variables. However, a *p*-value of 0.105 shows that the weak but positive linear relationship noted between the two variables is not statistically significant. A correlation test was also performed between alcohol use disorder in the past year and the occurrence of a major depressive episode in the past year. The linear relationship for the two variables was also weak and in the positive direction as evidenced by a correlation coefficient of 0.398. However, the linear relationship was statistically significant as shown by a *p*-value of 0.002 as shown in Table 5. Finally, a Pearson correlation test for the linear relationship between alcohol dependence in the past year and the occurrence of a major depressive episode in the past year yielded a correlation coefficient of 0.413, a

positive and weak linear relationship that was statistically significant as evidenced by a *p*-value of 0.001 as shown in Table 5.

In addition to the Pearson correlation test, a multiple regression test was performed to help determine the influence of the different independent variables on variation that was noted in the occurrence of mental illnesses in the American adolescent population.

Table 6 shows that an R Square value of 0.242. This value shows that our predictor model which includes constants such as alcohol dependence in the past year, alcohol use in the past month, first use of marijuana, alcohol use disorder in the past year, and marijuana use in the past month explains 24.2% of the variation that is seen in the occurrence of major depressive episodes in the past year in the American adolescent population. From the perspective of this study, the finding of an R Square means that marijuana and alcohol use and abuse have a significant influence on the occurrence of mental illnesses or episodes of depression among the adolescent population in the United States. With the Durbin-Watson value at 1.703, it is a healthy assumption that first order linear auto-correlations are nonexistent in the multiple regression performed in this study.

Table 6

Model Summary From the Multiple Regression Test

Model Summary[b]

Model		R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
	492[a]	242	160	.0103736114091	.242	2.939	5	6	022	1.703

An *F*-test was performed together with the multiple regression to test whether the model which included the use of abuse of alcohol and marijuana as the independent variables as explained by the five proxies explained any statistically significant variance in the occurrence of mental illnesses in the adolescent population.

Table 7 shows the ANOVA results for the for the multiple regression test. The regression model hypothesized that the marijuana and alcohol abuse have a measurable and statistically significant effect on mental illnesses among the American adolescent population. The *p*-value of 0.002 shows that the hypothesis, that marijuana, and alcohol use and abuse significantly affect their mental health was correct. The null hypothesis that marijuana and alcohol use and abuse have no statistically significant influence on mental illnesses in the American adolescence is rejected ($p < 0.05$). This means that the two independent variables have a statistically significant influence on the occurrence of

mental illnesses. While there were two independent variables in the proposed study, there were five proxies used to measure the two variables. The multiple regression allows one to calculate the coefficients that predict the effect of each individual proxy on the dependent variable.

Table 7

ANOVA Results From the F-Test

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.002	5	.000	2.939	.022[b]
	Residual	.005	46	.000		
	Total	.007	51			

Table 8 shows coefficients for the various proxies. From this table, one can deduce that Predicted (Major depressive episode in the past year) = 0.073(Marijuana use in the past month) + 0.178(First use of marijuana) – 0.117(Alcohol use in the past month) + 0.861(Alcohol use disorder in the past year) + 2.749(Alcohol dependence in the past year). The coefficients of this mode can be used to determine the predicted effect of use and abuse of alcohol and marijuana on the occurrence of mental illnesses among the adolescent population in the United States.

Table 8

Effect Coefficients for the Proxies of the Independent Variables

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
			Std. BError	Beta		tSig.	Lower Bound	Upper Bound
1	(Constant)	.069	.016		.241	000	036	.102
	Marijuana use in the past month	.073	.184	.106	398	692	.297	.444
	First use of marijuana	.178	.273	.170	652	518	.372	.728
	Alcohol use in the past month	.117	.133	-.171	.876	386	.384	.151
	Alcohol use disorder in the past year	.861	.785	.226	.098	278	-.718	2.441
	Alcohol dependence in the past year	.749	.024	.236	.358	181	-1.326	6.824

Section 4: Application to Professional Practice and Implications for Social Change

Preamble

In addition to identifying the association between substance abuse with specific regard to marijuana and alcohol use among the American adolescent population, my intention with this study was also to explore differences between the state-level prevalence and the averages reported nationally to determine whether there was a statistically significant difference. One of the practices identified in the problem statement was that the reporting format commonly used involves reporting prevalence and incidence rates using national level data. This is more the case when the data are collected and published by federal agencies. It was highlighted in the problem statement that this is the format that is used by Youth.gov (n.d.) when reporting on statistics relating to the use and abuse of drugs and other substances and the comorbidity of mental illnesses. This kind of reporting is in line with the mandate of such agencies to reduce the incidence and prevalence rates.

However, such reporting might give the appearance that the problem in question is in control in all the states if the national prevalence rate is favourable. While this practice is appropriate for federal agencies, state-level agencies aiming to achieve a reduced incidence and prevalence of alcohol and marijuana abuse and comorbidity of mental illnesses should compare state-level data with the national level data to determine the effectiveness of the strategies being implemented at the local level. This chapter will highlight the findings of the study with regards to this practice and aspect and make

recommendations for best practices. Additionally, the chapter includes a discussion of the findings with regards to the presence or absence of a linear association between the use and abuse of marijuana and alcohol and mental illnesses among the adolescent population.

Trends in the State-Level and National-Level Data

The database used in this study provided data on the prevalence or incidence rate of the various proxies for all the states and District of Columbia and the average prevalence rate at the national level. Two trends were emergent when the data were analyzed further. One of the trends was that there was no statistically significant difference when the prevalence or incidence rate at the state level was aggregated for individual proxies and compared with the national average. As shown in Table 4 when the averages for all the states were compared with the national average for the prevalence rate for the use of marijuana in the past month, the mean difference was .0011152678462 or 0.1%, a difference that was not statically significant ($p = 0.0625$). The same finding was reported in Table 4 where a comparison of the average incidence rate of the first use of marijuana for all the states and the national average yielded a mean difference of -.0017780304231 or -0.2%, a difference that was not statistically significant (0.242). This is the trend that was noted for all the proxies for the independent and dependent variable as reported in the various output tables presented in the previous chapter.

This trend can be attributed to certain factors in the data collection process by the SAMHSA. Considering that the data were collected by SAMHSA in the same household

survey using similar methodologies, it is expected that there will be no statistically significant difference between the national level data and the average of the state data for the same proxy. This is a testament to the reliability of the data collection methods that SAMHSA used during the household survey. Performing this comparison to yield information for professional practice is myopic because it gives an impression that what is reflected in the national average is congruent to the situation in the individual states.

Another trend that was emergent from the analysis of the data is that there were states in which the prevalence or incidence rate for the various states was above the national average while the prevalence and incidence rate for the same proxy in other states were below the national average. This is an important finding for a public health officer at the state level because it gives an overview of the effectiveness of the overall interventions implemented at the state level to combat drug use and abuse and the comorbidity of mental illnesses. For instance, states such as Utah, Alabama, Nebraska, Mississippi, Iowa, Louisiana, Oklahoma, Virginia, Tennessee, North Carolina, Ohio, West Virginia, Hawaii, North Dakota, Minnesota, Kentucky, South Dakota, Kansas, Arkansas, Idaho, Illinois, Missouri, South Carolina, Wyoming, Florida, New Jersey, Texas, Georgia, and Pennsylvania had a lower than average use of marijuana in the past month compared to states such as Nevada, Delaware, New York, Wisconsin, Arizona, Michigan, Indiana, California, Connecticut, New Mexico, Montana, District of Columbia, Washington, Maryland, Massachusetts, Oregon, New Hampshire, Maine, Rhode Island,

Alaska, Vermont and Colorado in which the prevalence rate of the use of marijuana in the past month was higher than the national average as shown in Table A1.

The states in which the incidence or prevalence rate for various proxies are higher than the national averages should be of more focus from the state agencies. This is because a prevalence or incidence rate that is higher than the national average shows that if there are interventions in the state aimed at reducing the behaviour that the proxies measure, the interventions do not have the desired effect. The reasons for which the prevalence rates are higher than the national averages should be investigated to inform any reforms in the interventions in place or a change of approach.

That the prevalence rate or incidence rate for some proxies in some states were higher than the national averages vindicated the highlight in the problem statement that the current reporting format obscures the actual picture of the problem at the state level when the studies are performed or sponsored by federal agencies. This argument is supported by the fact that the analysis of the data found that the prevalence and incidence rates for all the proxies differed in a statistically significant manner from one state to another. This finding indicated that while national-level data are important in showing the progress the country has made in reducing the use and abuse of alcohol and marijuana among the adolescent population as well as the comorbidity of mental illnesses, even focus should be on the state level data because it is from this foundation that the national averages are drawn.

Association Between Substance Abuse and Mental Illness

Another aim of the study was to determine whether an association existed between the use and abuse of marijuana and alcohol and the comorbidity of mental illnesses. The data on the proxies for alcohol use and the occurrence of mental illnesses were analyzed to yield the Pearson correlation coefficient. With regards to alcohol use in the past month as a proxy, the correlation coefficient was 0.176 (p-value = .105). The correlation coefficients for alcohol use disorder in the past year and alcohol dependence in the past year with the occurrence of mental illnesses were 0.398 (p-value = .002) and 0.413 (p-value = .001) respectively. These coefficients showed that a positive but weak linear relationship occurs between the use and abuse of alcohol and mental illnesses. The implication of this linear relationship is that the continued use and abuse of alcohol among the adolescents increased the likelihood of developing mental illnesses, particularly depression. This finding is supported by other studies such as the study performed by Tembo, Burns, and Kalembo (2017).

This is a relationship that has been found and described in other studies. Although Tembo et al. (2017) used a study sample of adolescents aged between 18 years and 24 years, their findings that the consumption of high levels of alcohol increased the likelihood of developing psychological distress by a factor of 1.2 (OR 1.2, 95% CI: 1.1–1.5) is still significant for this study. Studies performed on the adolescent population have shown the likelihood of developing mental illnesses increases when the adolescents engage in the consumption of alcohol (Degenhardt, Swift & Slade, 2012). Degenhardt et

al. (2012), in their study of adolescents in Australia, concluded that adolescents who used and abused alcohol increase their risk of developing risky drinking behaviours; the dependence on alcohol; and other mental illnesses such as depressive disorders and anxiety.

The association between the use and abuse of marijuana was measured using two proxies. The correlation coefficient for the relationship between the use of marijuana in the past month and the occurrence of major depressive episodes in the past year was 0.323 (*p*-value = .010) while the correlation coefficient for the relationship between the first use of marijuana and the occurrence of major depressive episodes in the past year was 0.298 (*p*-value = .016). The correlation coefficients showed that the relationship between the two proxies of the independent variable and the dependent variable was weak and of the positive direction. However, the *p*-values of the relationship between the two proxies of the independent variable and the proxy for the dependent variable as shown in Table 5 were statistically significant.

This relationship has also been found and described in other studies. For instance, Paruk and Burns (2014) found that when adolescents were initiated into the use and abuse of marijuana at an early age, they were predisposed to the development of mental disorders such as psychosis. This finding was also supported by the study performed by Chen, Wagner, and Anthony (2002), who found a moderate association between the risk of developing a major depressive episode and the use of marijuana. This finding was also reported more recently by Bechtold, Pardini, Simpson, and White (2015), who found that

the use of marijuana by adolescents was associated with the occurrence of mental problems.

With regards to the association between the two variables, Canadian Center on Substance Abuse (2013) highlighted the commonality of both protective and risk factors for mental illnesses and the use and abuse of drugs among the adolescents, the fact that adolescents who are diagnosed with mental illnesses are more likely to engage in the use and abuse of drugs later in their lives, and the fact that the use and abuse of drugs can also cause the development of mental illnesses.

Implications for Social Change and Practice

The findings of the study have not only implications for social change but also professional and scholarly practice. The study revealed a statistically significant association between alcohol use and the occurrence of mental illnesses in the adolescent population in the United States. However, this finding did not account for the association between different levels of alcohol intake and the occurrence of mental illnesses. Future studies should incorporate designs that assess the different levels of alcohol intake in the adolescents to determine whether the presence and statistical significance of the association between alcohol intake and the occurrence of mental illnesses in the adolescent population vary with the amount of alcohol consumed.

There are many confounding factors for which the present study was not controlled due to the limitations in the nature of the data used. The fact that the data used

were not specifically collected for the study implied that there are variables that would be desirable for which data were not available. In the case of this study, such variables include gender, socioeconomic status, education, and race. The fact that data on these variables were not available means that their effect could not be controlled or quantified in the study. Consequently, federal agencies tasked with performing these household surveys should consider and collect data for other confounding variables that might affect the findings for the variables of interest in their surveys.

The findings confirmed the concern that the reporting format used by federal agencies reporting data on prevalence and incidence rate from national surveys at national levels obscures the gravity of the situation at the state and lower levels, especially if the national prevalence is favourable. The finding that some states reported higher incidence and prevalence rate for certain proxies that were higher than the reported national levels vindicates this concern. In this regard, it is recommended for a change in reporting practices to include a comparison between the averages for various states and the reported national average. Assuming a confluence of factors enabling the states where their averages are higher the national prevalence implement interventions to lower the prevalence rates in their jurisdictions, the resulting sustained effort will result in an overall reduction in the prevalence of the problem at both the state and national level.

Public health agencies tasked with dealing with either mental illnesses or drug abuse among the adolescent population and other cohorts to consider the comorbidity dimension when designing interventions or assessing prevalence and incidence in

population surveys. This recommendation is justified by the finding of a statistically significant association between the use and abuse of alcohol and marijuana through proxies such as marijuana use in the past month ($p = 0.01$), first use of marijuana ($p = 0.016$), alcohol use disorder in the past year ($p = 0.002$), alcohol dependence in the past year ($p = 0.001$), and the occurrence of mental illnesses.

The findings of the study are significant for practice. However, there is a need to consider some of the limitations to the study. The hypothesized association between the two variables may be hindered by other confounding variables that may not be analyzed in this study because of the nature of the dataset available. This is also a trend in the existing literature where other factors such a gender, socio-economic status, and other similar variables have not been explored for an influencing role in the relationship between the dependent and independent variable. Another limitation of the study is that the national averages might have been drawn from an aggregation of the state level data, a fact that would render any comparison between the two averages moot. However, the finding that the averages in some states were higher than the reported national average still gives credence to the comparison.

Conclusions

This study was necessitated by the fact that despite the many interventions designed and implemented, the prevalence and incidence of use and abuse of drugs remained high. Furthermore, the comorbidity between drug use and the occurrence of mental illnesses amongst the adolescent population had been noted and reported in many

studies such as those performed by the National Institute on Drug Abuse (2010), Langas et al. (2011), and Wu et al. (2011). The current study focused on marijuana and alcohol as the two drugs of interest. This decision was based on the statistical evidence that the two were some of the highest used drugs by the adolescent population. Using six proxies where three measured the use and abuse of alcohol, two proxies for the use and abuse of alcohol and one proxy for the dependent variable, the study analyzed secondary data from the national household survey performed by SAMHSA between 2014 and 2015.

One of the gaps in information identified in the literature as part of the problem to be resolved in this study was that the reporting format in studies commissioned by federal agencies reported national-level averages even when such averages were means of the indicators for different states. The implication of this reporting format is that it might obscure the extent of a problem at the state level. The study sought to compare the state level prevalence and incidences with the reported national averages to determine whether there was a variance of statistical significance. Another gap that was identified as part of the problem to be resolved in the study was that many of the studies that identified comorbidity between the use and abuse of alcohol and the occurrence of major depressive disorders did not benefit from the use of national-level data. Additionally, the data were relatively dated compared to the recent data in the database used in this study. With the benefit of recent and national data, the study aimed to determine whether a similar linear relationship existed between the between the use and abuse of alcohol and the occurrence of major depressive disorders.

This study found that the state level averages did not vary significantly with the reported national level averages. However, this finding was attributed to the fact that the prevalence and incidence at the national level were aggregated from the data collected from various states. Even more significant was the finding that there was a high number of states for which the incidence and prevalence rate for various proxies was higher than the rates reported at the national level. The study found that there was a statistically significant linear relationship between alcohol and marijuana use and abuse. The marijuana uses in the past month ($p = 0.01$), first use of marijuana ($p = 0.016$), alcohol use disorder in the past year ($p = 0.002$), alcohol dependence in the past year ($p = 0.001$) respectively, are significantly related to the occurrence of mental illnesses in the adolescent population.

These findings contribute to the existing knowledge on the subject area. They support the findings by some of the studies such as those performed by Harris and Edlund (2005), Bickner and Schmidt (2008), Schwinn et al. (2010), and de Dios et al. (2010) that demonstrated a linear relationship between the use and abuse of alcohol and the occurrence of major depressive disorders. The findings also contributed to literature by underscoring the concerns that the reporting format might obscure the extent of the situation at the lower levels when the data are reported at the national level by studies that are commissioned and funded by federal agencies. Report your findings in a more direct manner. Findings from this study showed varied prevalence and incidence rates across the states. Hence, the need for state-level data when developing public health strategies.

The findings of the study have implications for both practice and social change. With regards to practice, the findings underscore the need for public health officers and agencies to consider both drug use and abuse and the comorbidity of mental illnesses in inclusion. The literature review showed that the comorbidity is influenced by a multiplicity of factors that are found both in the individuals and the environments in which they live, some of which include the crime rate in the neighbourhoods, parental and parochial control and socioeconomic status. While the effect of many of these factors would have been quantified by analyzing data on the confounding variables, the absence of which was noted in the limitations to the study, the theoretical perspectives argued by the scholars cited gave plausible explanations. For instance, Low et al. (2012) and Pedersen et al. (2015) explained that the adolescents used the drugs to attenuate the effects of the mental issues such as depression and social anxiety.

Further implications for practice relate to the reporting format used by federal agencies. While using the national level data for public health prevention and control strategies, is not erroneous, especially because many of the reports also include the averages for the various states. It is important for public health officers assessing progress to consider that only looking at the national averages might obscure the full extent of the problem in some states. With regards to social change, the findings of the study and the advancement of knowledge will aid in the development of more targeted interventions to deal with the problem described by the dependent and independent variables used in the study.

References

Agency for Healthcare Research and Quality. (2012). *Disparities in health care quality among racial and ethnic groups: Selected findings from the 2011 National Healthcare Quality and Disparities Reports*. Rockville, MD: U.S. Department of Health and Human Service.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Author.

Barker, P. (1992). *Severe depression*. London, UK: Chapman & Hall.

Bechtold, J., Pardini, D., Simpson, T. & White, H. (2015). Chronic adolescent marijuana use as a risk factor for physical and mental health problems in young adult men. *Psychology of Addictive Behaviors*, *29*(3), 552-563.

Bickner, J. & Schmidt, N. (2008). Marijuana effect expectancies: relations to social anxiety and marijuana use problems. *Addictive Behavior,* 33(11), 1477-1483.

Blackwell, D. L. (2010). *Family structure and children's health in the United States: Findings from the National Health Interview Survey, 2001-2007*. Washington, DC: National Center for Health Statistics.

Bose, J., Hedden, S., Lipari, R., & Park-Lee, E. (2016). *Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health*. Rockville, MD: Substance Abuse and Mental Health

Services Administration.

Bottorff, J., Johnson, J., Moffat, B., & Mulvogue, T. (2009). Relief-oriented use of marijuana by teens. *Substance Abuse Treatment and Prevention Policy,* 4,7.

Brook, D., Brook, J., Zhang, C., Cohen, P. & Whiteman, M. (2002). Drug use and the risk of major depressive disorder, alcohol dependence, and substance use disorders. *Achieves of General Psychiatry, 59*(11), 1039-1044.

Brown, R. (2006). *Doing your dissertation in business and management* (1st ed.). London, UK: SAGE.

Canadian Center on Substance Abuse. (2013). *When mental health and substance abuse problems collide*. Retrieved from http://www.ccsa.ca/Resource%20Library/CCSA-Mental-Health-and- Substance-Abuse-2013-en.pdf

Center for Behavioral Health Statistics and Quality. (2015). *2014 National Survey on Drug Use and Health: Detailed Tables*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Centers for Disease Control and Prevention. (2014). Youth risk behavior surveillance — United States, 2013. *Morbidity and Mortality Weekly Report, 63*(4).

Chen, C., Wagner, F. & Anthony, J. (2002). Marijuana use and the risk of major depressive episode. Epidemiological evidence from the United States National

Comorbidity Survey. *Social Psychiatry and Psychiatric Epidemiology, 37*(5), 199-206.

Christensen, H., Pallister, E., Smale, S., Hickie, I. B., & Calear, A. L. (2010). Community-based prevention programs for anxiety and depression in youth: a systematic review. *Journal of Primary Prevention, 31*(3), 139-170.

Clark, H., Ringwalt, C., & Shamblen, S. (2011). Predicting adolescent substance use: the effects of depressed mood and positive expectancies. *Addictive Behavior*, *36*(5), 488-493.

Curan, G., White, R. & Hansell, S. (2000). Personality, environment, and problem drug use. *Journal of Drug Issues, 30*, 375-406.

Curwin, J., & Slater, R. (2008). *Quantitative methods for business decisions.* London, UK: South-Western Cengage Learning.

de Dios, M., Hagerty, C., Herman, D., Hayaki, J., Anderson, B., Budney, A. & Stein, M. (2010). General anxiety disorder symptoms, tension reduction, and marijuana use among young adult females. *Journal of Women's Health*, *19*(9), 1635-1642.

Deas, D. (2006). Adolescent substance abuse and psychiatric comorbidities. *Journal of Clinical Psychiatry, 67*(7), 18-23.

Degenhardt, L., Hall, W. & Linskey, M. (2003). Exploring the association between cannabis use and depression. *Addiction, 98*(11), 1493-1504.

Degenhardt, L., Swift, W., & Slade, T. (2012). *The relationship between alcohol use and mental disorders from adolescence to young adulthood - longitudinal analyses from a large Australian cohort study.* Retrieved from https://ndarc.med.unsw.edu.au/project/relationship-between-alcohol-use-and-mental-disorders-adolescence-young-adulthood

Graham, G. (2010). *The disordered mind: An introduction to philosophy of mind and mental illness*. New York, NY: Routledge.

Hanson, M. & Chen, E. (2007). Socioeconomic status and substance use behaviors in adolescents: The role of family resources versus family social status. *Journal of Health Psychology,* 12(1), 32-35.

Harris, K. & Edlund, M. (2005). Self-medication of mental health problems: new evidence from a national survey. *Health Services Research*, 40(1), 117-134.

Hughes, A., Lipari, R. & Williams, M. (2015). *State Estimates of Adolescent Marijuana Use and Perceptions Of Risk Of Harm From Marijuana Use: 2013 And 2014.* Retrieved from https://www.samhsa.gov/data/sites/default/files/report_2121/ShortReport-2121.html

Humensky, J. (2010). Are adolescents with high socioeconomic status more likely to engage in alcohol and illicit drug use in early adulthood? *Substance Abuse Treatment, Prevention, and Policy,* 5:19 https://doi.org/10.1186/1747-597X-5-19

Institute of Medicine Committee on a National Surveillance System for Cardiovascular and Select Chronic Diseases. (2011). *A Nationwide Framework for Surveillance of Cardiovascular and Chronic Lung Diseases.* Washington D.C. National Academies Press.

Kaminer, Y. & Bukstein, O. (2007). *Adolescent Substance Abuse: Psychiatric Comorbidity and High Risk Behaviors.* New York, NY: Haworth Press.

Kaminer, Y., Connor, D. & Curry, J. (2007). Comorbid adolescent substance use and major depressive disorders: A review. *Psychiatry*, *4*(12), 32-43.

Kessler, R., Berglund, P., Demler, O., Jin, R., Koretz, D., & Merikangas, K. et al. (2003). The Epidemiology of Major Depressive Disorder. *JAMA*, *289*(23), 3095. http://dx.doi.org/10.1001/jama.289.23.3095

Kessler, R., Chiu, W., Demler, O., & Walters, E. (2005). Prevalence, Severity, and Comorbidity of 12-Month DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 617. http://dx.doi.org/10.1001/archpsyc.62.6.617

Kimberlin, C. & Winterstein, A. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy*, 65(23), 2276-2284.

Koziol, N. & Arthur, A. (2011). *An Introduction to Secondary Data Analysis*. Retrieved

from

http://r2ed.unl.edu/presentations/2011/RMS/120911_Koziol/120911_Koziol.pdf

Kulis, S., Marsiglia, F., Sicotte, D. & Nieri, T. (2007). Neighbourhood Effects on Youth Substance Use in a Southwestern City. *Sociological Perspectives*, 50(2), 273-301.

Langas, A., Malt, U. & Opjordsmoen, S. (2011). Comorbid mental disorders in substance users from a single catchment area - a clinical study. *BMC Psychiatry,* 11, 25.

Low, N., Dugas, E., O'Loughlin, E., Rodriguez, E., Contreras, G., Chaiton, M. & O'Loughlin, J. (2012). Common stressful life events and difficulties are associated with mental health symptoms and substance use in young adolescents. *BMC Psychiatry*, 12, 116.

Measelle, J., Stice, E. & Springer, D. (2006). A prospective test of the negative affect model of substance abuse: moderating effects of social support. *Psychology of Addictive Behavior*, 20(3), 225-233.

Meyers, J. & Dick, D. (2010). Genetic and Environmental Risk Factors for Adolescent-Onset Substance Use Disorders. *Child and Adolescent Psychiatric Clinics of North America*, 19(3), 465-477.

Mutrie, N. (2000). The relationship between physical activity and clinically defined depression. In S. Biddle, K. Fox & S. Boutcher, *Physical Activity and*

Psychological Well-Being (1st ed., pp. 46-62). Routledge.

National Alliance on Mental Illness. (n.d.). *Mental Health Facts. Children & Teens.* Retrieved from https://www.nami.org/getattachment/Learn-More/Mental-Health-by-the-Numbers/childrenmhfacts.pdf

National Institute on Drug Abuse. (2010). *Comorbidity: Addiction and Other Mental Illnesses.* Retrieved from https://www.drugabuse.gov/publications/research-reports/comorbidity-addiction-other-mental-illnesses/why-do-drug-use-disorders-often-co-occur-other-men

Norris, G., Qureshi, F., Howitt, D. & Cramer, D. (2014). *Introduction to Statistics with SPSS for Social Science*. New York. Routledge.

Office of Adolescent Health. (2016). The Changing Face of America's Adolescents. Retrieved from https://www.hhs.gov/ash/oah/facts-and-stats/changing-face-of-americas-adolescents/index.html

Pampel, F. C., Kreueger, P. M., & Denney, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology, 36*, 349–370.

Paruk, S. & Burns, J. (2014). Cannabis and mental illness in adolescents: a review. *South African Family Practice,* 58(1), 18-21.

Pedersen, E., Miles, J., Osilla, K., Ewing, B., Hunter, S. & D'Amico, E. (2015). The effects of mental health symptoms and marijuana expectancies on marijuana use

and consequences among at-risk adolescents. Journal of Drug Issues, 45(2), 151-165.

Quitno, M. (2003). *Eighth Annual Safest Metro Area Award*. Retrieved from http://www.morganquitno.com/met02safe.htm

Rao. U., Daley, S. & Hammen, C. (2000). Relationship between depression and substance use disorders in adolescent women during the transition to adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39(2), 215-222.

Reinecke, M. & Davison, M. (2002). *Depression: A Practitioner's Guide to Comparative Treatments*. Springer Publishing.

Roberts, R., Roberts, C. & Xing, Y. (2006). Comorbidity of Substance Use Disorders and Other Psychiatric Disorders Among Adolescents: Evidence from an Epidemiologic Survey. *Drug and Alcohol Dependence,* 88(1), 4-13.

Sampson, J., Morenoff, D., & Earls, F. (1999). Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children. *American Sociological Review,* 64,633–660.

Schwarz, S. (2009). *Adolescent Mental Health in the United States. Facts for Policymakers*. National Center for Children in Poverty. Retrieved from http://www.nccp.org/publications/pub_878.html

Schwinn, T., Schinke, S. & Trent, D. (2010). Substance Use among Late Adolescent

Urban Youths: Mental Health and Gender Influences. *Addictive Behaviors,* 35(1), 30-34.

Substance Abuse and Mental Health Services Administration. (2014). *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. NSDUH Series H-48, HHS Publication No. (SMA) 14-4863.* Rockville, MD: Author.

Substance Abuse and Mental Health Services Administration. (2015). *National Survey on Drug Use and Health: Comparison of 2013-2014 and 2014-2015 Population Percentages (50 States and the District of Columbia).* Retrieved from https://www.samhsa.gov/data/sites/default/files/NSDUHsaeShortTermCHG2015/NSDUHsaeShortTermCHG2015.htm

Substance Abuse and Mental Health Services Administration. (2016). *About Population Data / NSDUH.* Retrieved from https://www.samhsa.gov/data/population-data-nsduh/about

Taylor, M. (1999). *The fundamentals of clinical neuropsychiatry*. Oxford University Press.

Teen Help. (2014). *Teen Depression Statistics & Facts*. Retrieved January 11, 2017, from https://www.teenhelp.com/teen-depression/teen-depression-statistics/

Tembo, C., Burns, S. & Kalembo, F. (2017). The association between levels of alcohol

consumption and mental health problems and academic performance among young university students. *PLoS One*, 12(6), e0178142.

U.S. Census Bureau. (2014). *Current Population Survey, Annual Social and Economic Supplement, 2014.* Retrieved from http://www.census.gov/cps/data/cpstablecreator.html.

U.S. Department of Health and Human Services. (2011). *The health and well-being of children in rural areas: A portrait of the nation, 2007*. Rockville, MD: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau.

Vroom, V. (1964). Work and motivation. New York, NY: Wiley.

World Health Organization. (2016). Depression. Retrieved from http://www.who.int/mediacentre/factsheets/fs369/en/

Wu, P., Goodwin, R., Fuller, C., Liu, X., Comer, J., Cohen, P. & Hoven, C. (2010). The Relationship Between Anxiety Disorders and Substance Use Among Adolescents in the Community: Specificity and Gender Differences. *Journal of Youth and Adolescence*, 39(2), 177-188.

Wu, P., Hoven, C., Liu, X., Cohen, P., Fuller, C. Shaffer, D. (2011). Substance Use, Suicidal Ideation and Attempts in Children and Adolescents. *Suicide and Life-Threatening Behavior,* 34(4), 408-420.

Xu, H. (2004). *Relationships Between Quantitative Variables: Regression and Correlation*. Retrieved from http://www.stat.ucla.edu/~hqxu/stat11/ch12.pdf

Youth.gov. (n.d.). Retrieved from https://youth.gov/youth-topics/youth-mental-health/prevalance-mental-health-disorders-among-youth

Appendix A: Statistical Outputs

Table 9

Marijuana Use in the Past Month

		Marijuana use in the past month		
Order	**State**	**12-17 Estimate**	**12-17 95% CI (Lower)**	**12-17 95% CI (Upper)**
1	Total U.S.	7.20%	6.86%	7.56%
6	Alabama	5.16%	3.97%	6.68%
7	Alaska	10.64%	8.50%	13.24%
8	Arizona	7.71%	6.14%	9.65%
9	Arkansas	6.46%	5.07%	8.19%
10	California	8.32%	7.26%	9.52%
11	Colorado	11.13%	9.02%	13.65%
12	Connecticut	8.34%	6.63%	10.43%
13	Delaware	7.42%	5.88%	9.32%
14	District of Columbia	8.85%	6.85%	11.37%
15	Florida	6.78%	5.76%	7.96%
16	Georgia	6.92%	5.62%	8.48%
17	Hawaii	6.15%	4.76%	7.92%
18	Idaho	6.51%	5.11%	8.24%
19	Illinois	6.55%	5.50%	7.79%
20	Indiana	8.08%	6.42%	10.14%
21	Iowa	5.30%	4.01%	6.98%
22	Kansas	6.43%	5.00%	8.23%
23	Kentucky	6.36%	5.02%	8.01%
24	Louisiana	5.33%	4.13%	6.86%
25	Maine	10.01%	8.02%	12.43%
26	Maryland	9.20%	7.36%	11.46%
27	Massachusetts	9.22%	7.49%	11.31%
28	Michigan	8.06%	6.86%	9.45%
29	Minnesota	6.21%	4.84%	7.95%
30	Mississippi	5.29%	4.07%	6.85%
31	Missouri	6.56%	5.14%	8.35%

32	Montana	8.71%	7.00%	10.79%
33	Nebraska	5.26%	4.00%	6.88%
34	Nevada	7.39%	5.89%	9.25%
35	New Hampshire	9.44%	7.64%	11.62%
36	New Jersey	6.81%	5.52%	8.38%
37	New Mexico	8.53%	6.78%	10.68%
38	New York	7.55%	6.46%	8.81%
39	North Carolina	5.97%	4.82%	7.39%
40	North Dakota	6.21%	4.76%	8.07%
41	Ohio	6.05%	5.01%	7.29%
42	Oklahoma	5.42%	4.14%	7.07%
43	Oregon	9.42%	7.58%	11.66%
44	Pennsylvania	6.98%	5.84%	8.32%
45	Rhode Island	10.19%	8.24%	12.53%
46	South Carolina	6.57%	5.20%	8.26%
47	South Dakota	6.43%	5.03%	8.18%
48	Tennessee	5.90%	4.60%	7.54%
49	Texas	6.86%	5.83%	8.06%
50	Utah	4.54%	3.43%	5.99%
51	Vermont	10.86%	8.80%	13.32%
52	Virginia	5.44%	4.29%	6.87%
53	Washington	9.17%	7.32%	11.44%
54	West Virginia	6.05%	4.71%	7.75%
55	Wisconsin	7.60%	5.93%	9.70%
56	Wyoming	6.59%	5.15%	8.40%

Table 10

One-Sample Test for the State Averages for Marijuana Use in the Past Month

One-Sample Test					
	Test Value = 0				
	t	df	Sig. (2-	Mean Difference	95% Confidence Interval of the Difference

			tailed)		Lower	Upper
Marijuanauseinthepastmonth	32.248	51	.000	.07310543284 62	.0685542911 15	.0776565745 77

Table 11

One-Sample Test Against the National Average for Marijuana Use in the Past Month

One-Sample Test						
	Test Value = .0719901650					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Marijuanauseinthepastmonth	.492	51	.625	.00111526784 62	-.0034358738 85	.0056664095 77

Table 12

First Use of Marijuana

		First Use of Marijuana		
Order	**State**	**12-17 Estimate**	**12-17 95% CI (Lower)**	**12-17 95% CI (Upper)**
1	Total U.S.	5.41%	5.17%	5.65%
6	Alabama	4.36%	3.56%	5.34%
7	Alaska	7.52%	6.20%	9.10%
8	Arizona	6.09%	5.05%	7.33%
9	Arkansas	5.37%	4.45%	6.47%
10	California	5.89%	5.27%	6.58%
11	Colorado	8.16%	6.89%	9.65%

12	Connecticut	6.61%	5.50%	7.93%
13	Delaware	5.29%	4.36%	6.41%
14	District of Columbia	8.26%	6.81%	10.00%
15	Florida	5.57%	4.96%	6.24%
16	Georgia	5.17%	4.40%	6.08%
17	Hawaii	6.31%	5.12%	7.75%
18	Idaho	5.50%	4.50%	6.71%
19	Illinois	4.59%	4.00%	5.27%
20	Indiana	5.97%	4.98%	7.14%
21	Iowa	4.31%	3.49%	5.32%
22	Kansas	5.01%	4.14%	6.05%
23	Kentucky	4.62%	3.81%	5.59%
24	Louisiana	4.46%	3.65%	5.45%
25	Maine	7.45%	6.26%	8.84%
26	Maryland	6.12%	5.14%	7.27%
27	Massachusetts	6.82%	5.72%	8.11%
28	Michigan	5.79%	5.09%	6.57%
29	Minnesota	4.39%	3.61%	5.32%
30	Mississippi	4.41%	3.62%	5.35%
31	Missouri	5.62%	4.67%	6.76%
32	Montana	6.19%	5.15%	7.43%
33	Nebraska	3.51%	2.80%	4.39%
34	Nevada	6.28%	5.15%	7.63%
35	New Hampshire	6.82%	5.74%	8.09%
36	New Jersey	4.99%	4.22%	5.88%
37	New Mexico	6.71%	5.54%	8.11%
38	New York	5.43%	4.80%	6.14%
39	North Carolina	5.35%	4.57%	6.26%
40	North Dakota	4.91%	4.03%	5.97%
41	Ohio	4.90%	4.24%	5.66%
42	Oklahoma	5.62%	4.60%	6.85%
43	Oregon	6.85%	5.72%	8.17%
44	Pennsylvania	4.74%	4.11%	5.46%
45	Rhode Island	6.71%	5.53%	8.13%
46	South Carolina	5.82%	4.87%	6.96%
47	South Dakota	4.45%	3.64%	5.42%

48	Tennessee	4.46%	3.66%	5.43%
49	Texas	4.87%	4.28%	5.53%
50	Utah	3.05%	2.41%	3.86%
51	Vermont	6.97%	5.84%	8.30%
52	Virginia	5.03%	4.28%	5.91%
53	Washington	5.96%	4.93%	7.19%
54	West Virginia	5.66%	4.71%	6.78%
55	Wisconsin	6.05%	5.01%	7.28%
56	Wyoming	5.33%	4.39%	6.46%

Table 13

One-Sample Test Against the National Average

One-Sample Test						
	Test Value = 0.05788483					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Firstuseofmarijuana	-1.184	51	.242	-.001778030423 1	-.00479316598 4	.00123710513 8

Table 14

One-Sample Test for State-Level Incidence Rate

One-Sample Test						
	Test Value = 0					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper

Firstuseofmarijuana	37.358	51	.000	.056106799576 9	.053091664016	.059121935138

Table 15

Alcohol Use in the Past Month

		Alcohol use in the past month		
Order	**State**	**12-17 Estimate**	**12-17 95% CI (Lower)**	**12-17 95% CI (Upper)**
1	Total U.S.	10.58%	10.15%	11.02%
6	Alabama	8.76%	7.14%	10.71%
7	Alaska	11.04%	8.41%	14.35%
8	Arizona	10.45%	8.53%	12.74%
9	Arkansas	9.34%	7.66%	11.35%
10	California	10.92%	9.65%	12.34%
11	Colorado	12.55%	10.32%	15.17%
12	Connecticut	13.61%	11.10%	16.57%
13	Delaware	10.36%	8.56%	12.50%
14	District of Columbia	13.18%	10.55%	16.36%
15	Florida	10.72%	9.45%	12.14%
16	Georgia	8.93%	7.49%	10.62%
17	Hawaii	10.55%	8.50%	13.03%
18	Idaho	10.25%	8.30%	12.60%
19	Illinois	9.88%	8.52%	11.43%
20	Indiana	10.06%	8.22%	12.24%
21	Iowa	10.16%	8.20%	12.53%
22	Kansas	10.45%	8.59%	12.66%
23	Kentucky	8.24%	6.62%	10.22%
24	Louisiana	10.75%	8.85%	12.99%
25	Maine	12.47%	10.32%	15.00%
26	Maryland	12.09%	9.99%	14.57%
27	Massachusetts	12.21%	10.03%	14.79%
28	Michigan	10.69%	9.25%	12.32%

29	Minnesota	10.71%	8.88%	12.87%
30	Mississippi	8.78%	7.11%	10.80%
31	Missouri	9.83%	8.06%	11.92%
32	Montana	9.90%	8.03%	12.14%
33	Nebraska	8.88%	7.11%	11.04%
34	Nevada	13.67%	11.20%	16.58%
35	New Hampshire	13.12%	11.00%	15.59%
36	New Jersey	13.88%	11.77%	16.29%
37	New Mexico	9.40%	7.63%	11.53%
38	New York	12.57%	11.07%	14.24%
39	North Carolina	8.19%	6.78%	9.85%
40	North Dakota	11.85%	9.59%	14.55%
41	Ohio	10.33%	8.97%	11.86%
42	Oklahoma	10.22%	8.31%	12.52%
43	Oregon	11.68%	9.70%	14.00%
44	Pennsylvania	11.34%	9.85%	13.03%
45	Rhode Island	13.23%	10.82%	16.08%
46	South Carolina	8.87%	7.26%	10.80%
47	South Dakota	10.38%	8.45%	12.70%
48	Tennessee	8.17%	6.58%	10.10%
49	Texas	9.96%	8.76%	11.31%
50	Utah	5.44%	3.98%	7.40%
51	Vermont	13.16%	10.87%	15.83%
52	Virginia	10.65%	8.98%	12.59%
53	Washington	10.65%	8.73%	12.95%
54	West Virginia	9.97%	8.08%	12.25%
55	Wisconsin	11.25%	9.28%	13.57%
56	Wyoming	10.72%	7.98%	14.26%

Table 16

One-Sample Test for Alcohol Use in the Past Month for the State Level Data

One-Sample Test	
	Test Value = 0

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Alcoholuseinthepastmonth	46.267	51	.000	.1067449842308	.102113152748	.111376815713

Table 17

One-Sample Test for Alcohol Use in the Past Month Against the National Average

One-Sample Test						
	Test Value = 0.1057774658					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Alcoholuseinthepastmonth	.419	51	.677	.0009675184308	-.003664313052	.005599349913

Table 18

Alcohol Use Disorder in the Past Year

		Alcohol use disorder in the past year		
Order	**State**	**12-17 Estimate**	**12-17 95% CI (Lower)**	**12-17 95% CI (Upper)**
1	Total U.S.	2.62%	2.40%	2.85%
6	Alabama	2.17%	1.53%	3.08%
7	Alaska	2.55%	1.84%	3.53%
8	Arizona	2.90%	2.10%	4.01%
9	Arkansas	2.76%	1.99%	3.81%

10	California	2.73%	2.13%	3.49%
11	Colorado	3.20%	2.33%	4.39%
12	Connecticut	2.74%	1.93%	3.87%
13	Delaware	2.42%	1.74%	3.36%
14	District of Columbia	2.44%	1.64%	3.62%
15	Florida	2.69%	2.14%	3.36%
16	Georgia	2.18%	1.63%	2.91%
17	Hawaii	2.48%	1.67%	3.64%
18	Idaho	2.98%	2.20%	4.03%
19	Illinois	2.42%	1.89%	3.11%
20	Indiana	2.65%	1.90%	3.68%
21	Iowa	2.57%	1.80%	3.66%
22	Kansas	2.51%	1.78%	3.51%
23	Kentucky	2.36%	1.69%	3.29%
24	Louisiana	2.43%	1.72%	3.44%
25	Maine	2.52%	1.80%	3.53%
26	Maryland	2.56%	1.82%	3.59%
27	Massachusetts	2.98%	2.15%	4.14%
28	Michigan	2.63%	2.07%	3.34%
29	Minnesota	2.20%	1.55%	3.12%
30	Mississippi	2.17%	1.53%	3.07%
31	Missouri	2.28%	1.61%	3.23%
32	Montana	2.60%	1.84%	3.66%
33	Nebraska	2.33%	1.63%	3.31%
34	Nevada	3.02%	2.13%	4.25%
35	New Hampshire	2.68%	1.92%	3.74%
36	New Jersey	3.24%	2.38%	4.41%
37	New Mexico	2.59%	1.83%	3.67%
38	New York	2.51%	1.96%	3.21%
39	North Carolina	2.08%	1.53%	2.82%
40	North Dakota	2.96%	2.08%	4.18%
41	Ohio	2.45%	1.88%	3.18%
42	Oklahoma	2.11%	1.44%	3.08%
43	Oregon	3.05%	2.23%	4.16%
44	Pennsylvania	2.53%	1.95%	3.27%
45	Rhode Island	2.86%	2.01%	4.04%

46	South Carolina	2.56%	1.85%	3.55%
47	South Dakota	2.63%	1.83%	3.76%
48	Tennessee	2.18%	1.53%	3.08%
49	Texas	2.98%	2.35%	3.77%
50	Utah	2.26%	1.52%	3.34%
51	Vermont	2.75%	1.98%	3.83%
52	Virginia	2.19%	1.61%	2.97%
53	Washington	2.74%	1.97%	3.80%
54	West Virginia	2.87%	2.08%	3.95%
55	Wisconsin	3.06%	2.20%	4.25%
56	Wyoming	2.94%	2.02%	4.24%

Table 19

One-Sample Test for Alcohol Use Disorder in the Past Year

One-Sample Test						
	Test Value = 0					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Alcoholusedisorderinthepastyear	63.218	51	.000	.026024148431	.025197710493	.026850586353

Table 20

One-Sample Test for Alcohol Use Disorder in the Past Year Against the National Average

One-Sample Test					
	Test Value = 0.026152968				
	t	df	Sig. (2-	Mean Difference	95% Confidence Interval of the Difference

			taile d)		Lower	Upper
Alcoholusedisorderinthepastyear	-.313	51	.756	-.00012881957 69	-.0009552575 07	.0006976183 53

Table 21

Alcohol Dependence in the Past Year

		Alcohol dependence in the past year		
Order	**State**	**12-17 Estimate**	**12-17 95% CI (Lower)**	**12-17 95% CI (Upper)**
1	Total U.S.	0.95%	0.83%	1.09%
6	Alabama	0.80%	0.53%	1.20%
7	Alaska	0.87%	0.58%	1.31%
8	Arizona	1.10%	0.75%	1.61%
9	Arkansas	0.96%	0.65%	1.40%
10	California	1.07%	0.79%	1.45%
11	Colorado	1.11%	0.75%	1.63%
12	Connecticut	0.92%	0.63%	1.35%
13	Delaware	0.92%	0.63%	1.32%
14	District of Columbia	0.84%	0.53%	1.30%
15	Florida	0.86%	0.62%	1.18%
16	Georgia	0.84%	0.59%	1.19%
17	Hawaii	0.84%	0.54%	1.30%
18	Idaho	0.92%	0.64%	1.32%
19	Illinois	0.91%	0.66%	1.24%
20	Indiana	0.98%	0.67%	1.43%
21	Iowa	0.94%	0.64%	1.38%
22	Kansas	0.94%	0.63%	1.41%
23	Kentucky	0.82%	0.55%	1.23%
24	Louisiana	0.85%	0.57%	1.27%
25	Maine	0.86%	0.57%	1.28%

26	Maryland	0.79%	0.53%	1.18%
27	Massachusetts	0.91%	0.63%	1.32%
28	Michigan	0.95%	0.69%	1.31%
29	Minnesota	0.85%	0.58%	1.23%
30	Mississippi	0.85%	0.57%	1.26%
31	Missouri	0.83%	0.56%	1.23%
32	Montana	0.94%	0.65%	1.37%
33	Nebraska	0.92%	0.62%	1.35%
34	Nevada	1.04%	0.72%	1.50%
35	New Hampshire	0.88%	0.60%	1.29%
36	New Jersey	0.91%	0.63%	1.30%
37	New Mexico	1.23%	0.80%	1.89%
38	New York	1.02%	0.75%	1.39%
39	North Carolina	0.81%	0.58%	1.15%
40	North Dakota	0.97%	0.65%	1.43%
41	Ohio	0.95%	0.70%	1.29%
42	Oklahoma	0.84%	0.57%	1.23%
43	Oregon	1.06%	0.72%	1.55%
44	Pennsylvania	0.88%	0.64%	1.21%
45	Rhode Island	0.96%	0.66%	1.41%
46	South Carolina	0.81%	0.55%	1.18%
47	South Dakota	0.95%	0.66%	1.34%
48	Tennessee	0.79%	0.54%	1.17%
49	Texas	1.16%	0.85%	1.58%
50	Utah	0.95%	0.64%	1.40%
51	Vermont	0.96%	0.65%	1.43%
52	Virginia	0.83%	0.58%	1.17%
53	Washington	0.93%	0.64%	1.34%
54	West Virginia	0.96%	0.65%	1.41%
55	Wisconsin	0.98%	0.67%	1.42%
56	Wyoming	1.06%	0.74%	1.54%

Table 22

One-Sample Test for Alcohol Dependence in the Past Year

One-Sample Test						
	Test Value = 0					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Alcoholdependenceinthepastyear	68.977	51	.000	.009280585096 2	.009010473551	.009550696641

Table 23

One-Sample Test for Alcohol Dependence in the Past Year Against the National Average

One-Sample Test						
	Test Value = 0.009545901					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Alcoholdependenceinthepastyear	-1.972	51	.054	-.000265315 9038	-.000535427449	.000004795641

Table 24

Major Depressive Episodes in the Past Year

Order	State	Major depressive episode in the past year

		12-17 Estimate	12-17 95% CI (Lower)	12-17 95% CI (Upper)
1	Total U.S.	11.93%	11.48%	12.40%
6	Alabama	10.97%	9.08%	13.20%
7	Alaska	12.40%	10.27%	14.91%
8	Arizona	13.20%	11.02%	15.72%
9	Arkansas	12.72%	10.66%	15.12%
10	California	12.28%	11.02%	13.67%
11	Colorado	13.73%	11.51%	16.31%
12	Connecticut	11.49%	9.47%	13.88%
13	Delaware	11.47%	9.61%	13.64%
14	District of Columbia	9.96%	8.08%	12.23%
15	Florida	11.88%	10.52%	13.40%
16	Georgia	10.08%	8.49%	11.94%
17	Hawaii	9.87%	7.95%	12.17%
18	Idaho	13.03%	10.82%	15.61%
19	Illinois	11.20%	9.76%	12.83%
20	Indiana	14.64%	12.29%	17.34%
21	Iowa	11.87%	9.80%	14.30%
22	Kansas	11.18%	9.24%	13.48%
23	Kentucky	11.05%	9.17%	13.27%
24	Louisiana	11.00%	9.07%	13.29%
25	Maine	12.51%	10.42%	14.96%
26	Maryland	11.03%	9.16%	13.23%
27	Massachusetts	12.37%	10.25%	14.85%
28	Michigan	11.80%	10.36%	13.41%
29	Minnesota	12.55%	10.47%	14.96%
30	Mississippi	11.08%	9.11%	13.41%
31	Missouri	11.49%	9.60%	13.70%
32	Montana	11.42%	9.45%	13.73%
33	Nebraska	12.25%	10.19%	14.67%
34	Nevada	13.94%	11.58%	16.68%
35	New Hampshire	13.43%	11.26%	15.95%
36	New Jersey	10.32%	8.69%	12.22%
37	New Mexico	11.50%	9.53%	13.82%

38	New York	11.92%	10.56%	13.44%
39	North Carolina	12.35%	10.58%	14.36%
40	North Dakota	10.47%	8.66%	12.60%
41	Ohio	11.85%	10.43%	13.44%
42	Oklahoma	12.57%	10.35%	15.20%
43	Oregon	14.33%	12.04%	16.97%
44	Pennsylvania	11.64%	10.18%	13.28%
45	Rhode Island	13.03%	10.76%	15.70%
46	South Carolina	10.96%	9.13%	13.10%
47	South Dakota	9.90%	8.07%	12.09%
48	Tennessee	10.92%	8.99%	13.19%
49	Texas	11.53%	10.22%	12.99%
50	Utah	11.97%	10.05%	14.21%
51	Vermont	12.06%	10.05%	14.41%
52	Virginia	12.47%	10.63%	14.57%
53	Washington	12.54%	10.32%	15.14%
54	West Virginia	13.26%	11.09%	15.79%
55	Wisconsin	13.64%	11.42%	16.22%
56	Wyoming	13.31%	11.14%	15.84%

Table 25

One-Sample Test Major Depressive Episodes in the Past Year

One-Sample Test						
	Test Value = 0					
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	t	df			Lower	Upper
Majordepressiveepisodeinthepastyear	76.269	51	.000	.1196923587692	.116541773564	.122842943975

Table 26

One-Sample Test for Major Depressive Episode in the Past Year Against the National Average

One-Sample Test						
	Test Value = 0.1192993673					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Majordepressiveepisodeinthepastyear	.250	51	.803	.0003929914692	-.002757593736	.003543576675