

Addis Ababa University

College of Education and Language Studies

School of Psychology

The Relationship between Depression Symptoms and Substance use

among

High School Students in Addis Ababa, Ethiopia

By

Yeron Melkamu

October 2025

Addis Ababa University
College of education and behavioral studies
School of psychology

The Relationship between Depression Symptoms and Substance Use among
High School Students in Addis Ababa, Ethiopia

A Thesis submitted to school of psychology, College of Education and
Behavioral Studies, Addis Ababa University in Partial Fulfillment of the
Requirements for the Degree of Master of Arts in Developmental Psychology

By
Yeron Melkamu

Advisor
Mulat Asnake (PhD)

Addis Ababa University

College of education and behavioral studies

School of psychology

The Relationship between Depression symptoms and Substance use among
high school students in Addis Ababa, Ethiopia

Approved by Board of Examiners

_____ Advisor	_____ Signature
_____ Internal Examiner	_____ Signature
_____ External Examiner	_____ Signature

Acknowledgement

First and foremost I would like to thank God for giving me the wisdom and strength to complete this study. I am very grateful to my advisor, Dr. Mulat Asnake for his guidance, encouragement and constructive comments and all of his contributions for the study. I would also like to thank the students who participated in the study, for their valuable time and participation. Finally, I am very thankful to my family and friends for their constant encouragement and support during the process of conducting this study.

Abstract

This study investigated the relationship between depressive symptoms and substance use (tobacco, alcohol, and marijuana) among 365 students from Bole Senior Secondary School and Lem General Secondary School in Bole Sub-City, Addis Ababa. The objectives were to examine the relationship between depression and substance use and to explore demographic factors (gender, family income, and parental education) associated with them. Data were collected using the Beck Depression Inventory-II (BDI-II) and the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), and analyzed through Pearson's correlation, t-test, and ANOVA. Results revealed a significant ($p < .001$) moderate positive correlation between depression and substance use, with females reporting higher depression symptoms than males ($p < .001$). These findings highlight the need for integrated mental health and substance use prevention programs and gender-sensitive interventions.

Contents

Acknowledgement	I
Abstract	II
List of tables	VI
Chapter one	1
Introduction	1
1.1 Background	1
1.2 Statement of the problem	6
1.3 Research questions	8
1.4 objectives of the study	9
1.5 Significance of the study	10
1.6 Operational definition of terms	11
1.7 Limitations of the Study	11
1.8 Delimitations of the Study	12
Chapter two	13
Literature Review	13
2.1. Overview	13
2.2 Types and prevalence of substance use in adolescence period	13
2.3. Theories of substance use in adolescence	14
2.4. Factors contributing to substance use	15
2.5. Theories of depression	15
2.6. Depression and substance use	19
2.7. Summary and conceptual framework	28
Chapter three	30
Methodology	30
3.1 Study setting	30
3.2 Research design	30
3.3 Population and sampling	31
3.4 Data collection Instruments	32

3.5 Data collection procedures	34
3.6 Data analysis	35
3.7 Ethical considerations	36
Chapter Four	38
Findings	38
4.1 socio demographic characteristics of participants	38
4.2 Prevalence of depression symptoms	39
4.3 Prevalence of Substance use	40
4.4 Depression and substance use	43
4. 5 Gender Differences in Depression	44
4.6 Family Income and Depression	45
4.7 Parental Education and Depression	47
4.8 Gender Differences in Substance Use	49
4.9 Parental Education and Substance use	53
4.10 Family income and substance use	60
Chapter Five	65
Discussion	65
5.1 Prevalence of depression	65
5.2 Prevalence of substance use	66
5.3 The relationship between depressive symptoms and substance use	67
5.4 Differences in depression levels among students by socio-demographic factors (gender, family income, parental education, parental occupation)	68
5.5 Differences in substance-use levels among students by socio-demographic factors (gender, family income, parental education, parental occupation)	69
Chapter Six	72
Summary, Conclusions and Recommendations	72
6.1 Summary of key findings	72
6.2 Conclusions	73
6.3 Recommendations	74

7. References	78
Appendix	89

List of tables

Title	Pages
Table 1	38
Summary of Socio-demographic Characteristics of Participants (N = 365)	38
Table 2	39
Prevalence of Depression Symptoms (BDI-II; N = 365)	39
Table 3	40
Prevalence and Risk Categories of Tobacco Use Among High School Students (N = 365)	40
Table 4	41
Prevalence and Risk Categories of Alcohol Use Among High School Students (N = 365)	41
Table 5	42
Prevalence and Risk Categories of Marijuana Use Among High School Students (N = 365)	42
Table 6	44
Pearson Correlations between BDI-II Scores and Substance Use (N = 365)	44
Table 7	45
Independent Samples t-test for BDI-II Scores by Gender (N = 365)	45
Table 8	45
One-Way ANOVA of Income Level and BDI-II Scores	45
Table 9	46
Games–Howell Post Hoc Comparisons of Income Level and BDI-II Scores	46
Table 10	47
One-Way ANOVA of Education Level and BDI-II Scores	47
Table 11	48
Games–Howell Post Hoc Comparisons of Education Level and BDI-II Scores	48
Table 12	50
Group Statistics for Tobacco Use by Gender	50
Table 13	50
Independent-Samples t-test for Tobacco Use by Gender	50
Table 14	51
Group Statistics for Alcohol Use by Gender	51
Table 15	51

Independent-Samples t-test for Alcohol Use by Gender	51
Table 16	52
Group Statistics for Marijuana Use by Gender	52
Table 17	52
Independent-Samples t-test for Marijuana Use by Gender	52
Table 18	53
Descriptive Statistics of Tobacco Use by Parental Education	53
Table 19	54
One-Way ANOVA for Tobacco Use by Parental Education	54
Table 20	55
Games–Howell Post Hoc Test for Tobacco Use by Parental Education	55
Table 21	56
Descriptive Statistics of Alcohol Use by Parental Education	56
Table 22	57
One-Way ANOVA for Alcohol Use by Parental Education	57
Table 23	57
Games–Howell Post Hoc Comparisons of Alcohol Use by Parental Education	57
Table 24	59
Descriptive Statistics for Marijuana Use by Parental Education	59
Table 25	60
ANOVA Results for Marijuana Use by Parental Education	60
Table 26	61
One-Way ANOVA for Tobacco Use by Family Income	61
Table 27	61
One-Way ANOVA for Alcohol Use by Family Income	61
Table 28	62
Games-Howell Post Hoc Comparisons of Alcohol Use by Family Income	62
Table 29	63
One-Way ANOVA for Marijuana Use by Family Income	63
Table 30	64
Games-Howell Post Hoc Comparisons of Marijuana Use by Family Income	64

Chapter one

Introduction

1.1 Background

Adolescence is a very essential stage in human development. This stage is characterized by rapid physical, emotional, cognitive, and social development. Adolescence is a transitional period from childhood to adulthood, often distinguished by identity exploration, increased independence, and a higher sensitivity to peer pressure. Normative developmental characteristics of adolescence include emotional instability, higher impulsivity, a strong desire and need for social acceptance, and the exploring for self-identity. During this period, adolescents often face different challenges as they adapt to new roles and responsibilities in their families, schools, and communities (Steinberg, 2017).

Regarding Emotion management, the hormonal changes and brain development particularly in the prefrontal cortex and limbic system as well as heightened sensitivity to environmental stressors make adolescence overwhelming. Due to these changes adolescents more prone to emotional disturbances such as anxiety and depression. When adolescents struggle with emotional regulation, poor coping skills or the lack of supportive environments may lead to the development of mental health problems, including depression and substance abuse.

Depression is defined as a commonly encountered mental health problem which is characterized by feelings of unhappiness, over sleeping or under sleeping, pessimistic thoughts about the future and oneself and suicidal thoughts (WHO, 2017). The prevalence of depression is rising over the years. Between the years 2005 and 2015, the prevalence of depression has increased by 18.4%

worldwide (WHO, 2017). According to relatively recent estimates, around 322 million people in the world are affected by depression (WHO, 2017).

People who are struggling with depression have different symptoms. These symptoms can be grouped into five major groups: physical, emotional, behavioral, cognitive, and motivational. The physical symptoms include headache and low back pain, drowsiness, discomfort in the stomach and difficulty in digestion, extreme fatigue, dizziness, increased respiration rate, sleep disturbance and blurred vision; which are observed in above 50% of people who have depression (Mallinckrodt et al., 2003).

The emotional symptoms include feelings of disappointment, being unhappy, shame, and emptiness and hopelessness (American Psychiatric Association, 2013). The behavioral symptoms that can be observed when a person is depressed include being unproductive, isolating oneself from friends and peer groups, not getting out of bed, walking and talking slower than before and so on (WHO, 2021).

The cognitive symptoms include negative attitude about oneself, inability to focus, not appreciating oneself for achievements, being highly pessimistic, difficulty in solving simple problems and the like (Gimeno et al., 2009). The last group, symptoms regarding motivation, includes losing the strong feelings of wanting to chase dreams and activities that were once important to the individual.

There are different theories that attempt to explain depression. Among these theories, the psychodynamic theory of depression, the cognitive theory of depression, and the behavioral theory of depression are the major ones.

The existence of different theories that attempt to explain the causes of depression implies that the cause of depression is not clearly stated, meaning what causes depression has not been identified certainly. However, different scholars suggest different causes. To mention a few: chronic stress (Kiyohara & Yoshimasu, 2009), loss of a loved one (Fried et al., 2015), drastic changes in the external and internal environment of the individual (Cyranowski et al., 2000), unemployment, past family history as well as current family situation may cause depression (Matthews & Easton, 2021).

Among high school students, factors that are usually associated with causes of depression are lower performance or failure in school, unsatisfying results (grades), body dissatisfaction, being neglected or vulnerable to physical or emotional abuse, loss of a parent, separation of parents and not having the necessary support from adults around them (Harlak et al., 2008).

The prevalence of depression among adolescents is higher and has been increasing lately (Schmitt, 2021). Besides being one of the most common mental health problems, depression is also related with dangerous risky behaviors among adolescents such as self-harm (cutting oneself) and even suicide (Cybulski et al., 2021). Furthermore, depression is a primary cause of impaired functioning among adolescents which might lead to substance use and addiction (Ahuvia et al., 2021).

Majority of individuals who are dealing with substance use problems began using substances in their adolescence. Studies suggest that adolescence is a state of transition and a period of experimenting with substances and involvement in health risk behaviors for most people (Annor, 2016). Since almost all high school students are adolescents, they are vulnerable to these risks. A

study indicated that a considerable number of adolescents are involved in substance use behaviors (Obadeji et al., 2020).

Substance use is defined as the consistent use of at least one of the addictive substances that affect the physical and psychological health of the individual such as alcohol, cigarettes, and cannabis. Substances can be socially accepted such as cigarettes or alcohol and socially unacceptable as well as illegal like cannabis and cocaine (Kebede, 2009).

The rate of using illegal drugs is rising worldwide. From the total world's population, around 292 million people, about 5.6% of the population, have been involved or at least experimented with drugs (United Nations Office on Drugs and Crime [UNODC], 2023).

A study conducted in Kolfe-Keraniyo Sub City in Addis Ababa indicated that the prevalence of substance use is 26.5% (Seid et al., 2021). Among these lifetime substance users, 16% are alcohol users, 9.6% are cigarette users, 9.4% used khat and 6.7% used cannabis. 0.5% of the participants used all four substances mentioned above whereas around 1.5% used alcohol, cigarette and cannabis. 10.7% of the participants used two of the above-mentioned substances (Seid et al., 2021).

There are various determinants associated with substance use among high school students. These are unsatisfying relationship between parents and adolescents, separation of parents, having friends who are involved with substances (peer pressure), and having parents who use substances (Tavares et al., 2004). In addition, the contradicting messages that are transmitted through media about substance use also expose adolescents to different kinds of substance use.

Moreover, a research suggested that although people might use substances in social occasions, holidays, and parties for relaxation purposes, occasional substance use still has negative effects and affects the psychological as well as physical health of individuals (Mekonnen & Abay, 2007). Another study suggested that individuals might persist in the activity of using substances because substances help to alleviate pain and discomfort associated with anxiety and depression (Rassool, 2009). Even though both occasional and regular substance use affects the health of individuals, there are distinctive symptoms that indicate problematic substance use.

The symptoms that characterize problematic use of substance include persisting to use substance even after it has caused problems to the individual, excessive effort to obtain the substance, failed attempts to stop using drugs, isolating oneself and minimizing social activities and hobbies, tolerance and experiencing withdrawal effects when the individual tries to stop using the substance (American Psychiatric Association, 2013). Problematic substance use affects different aspects of the life of the individual.

Substance use affects the physical, psychological and social health of individuals. Individuals who started using substances at earlier age as adolescence are more vulnerable to various kinds of psychological disorders. Other research suggested that individuals who use more than one substance are more vulnerable to different mental health problems (Kebede, 2009). As the effects of substance use differ for different substances, so does the mechanism of action for different substances.

Substances can be classified into depressants, stimulants, and hallucinogens. Depressant substances are substances that depress the condition in which the central nervous system performs (Alkattan et al., 2021), whereas the stimulants are substances that increase the

condition in which the central nervous system is performing. On the other hand, hallucinogens are substances that disrupt the sensation and perception of the individual by creating excitation of the central nervous system (Nichols, 2004).

Difficulties related to substance use disorders are among the major factors that are associated with depression among adolescents (Singh et al., 2017). This interconnection further shows the cyclical relationship between these two conditions. Adolescents may resort to substances to cope with emotional distress and depressive symptoms, while continued substance use can exacerbate or even trigger more severe depressive episodes. This bidirectional relationship highlights the importance of investigating how substance use and depression are linked during adolescence.

1.2 Statement of the problem

Most of the time individuals who are involved in substance use problems such as smoking cigarettes, drinking alcohol and cannabis use are also affected by depression. A Study indicated that around 69.2% of the people who are involved in substance use are also affected by depression (Kebede, 2009). Adolescents who are involved in cigarette smoking and related behaviors are more vulnerable to depression compared to adolescents who do not smoke (Goodman & Capitman, 2000). However this does not imply that smoking causes depression because there is also evidence that indicate adolescents who are depressed are also likely to be involved in cigarette smoking (Weinberger et al., 2017). Similarly there exists comorbidity between alcohol use and depression as well as between cannabis use and depression. However the nature, strength and direction of the relationship between the depression and substance use is not clearly and confidently stated. Since significant portion of the population of people who use

substance are also depressed, the relationship between these two variables needs to be investigated.

Although there are a number of studies conducted about the prevalence of and factors associated with both depression and substance use, studies about the co morbidity and relationship between these two variables are rare. Moreover the very few studies that attempt to investigate the relationship between the two variables are conducted among age groups other than adolescence. Finding out the existence of a relationship and the strength and the direction of that relationship would be very helpful in the process of solving the problems associated with depression as well as substance use. Therefore this study will attempt to investigate if there is a relationship between these two variables as well as the direction and the strength of the relationship if the relationship exists.

In Ethiopia, even though there are studies conducted on depression and substance use among adolescents, the studies have mainly addressed these problems separately. For example, a study reported that a significant proportion of high school students in Northwest Ethiopia experienced depressive symptoms due to poor academic performance, family conflict, and low social support (Dachew et al., 2015). On the other hand a study conducted in Addis Ababa found that 26.5% of high school students in Addis Ababa had used at least one substance; alcohol, chat, and cannabis were the most common substances (Seid et al., 2021). Similarly, another study also indicated that substance use was prevalent among adolescents in Ethiopia, particularly among males and those with peer pressure or lack of parental supervision (Tadesse et al., 2020) .

Despite these findings, there is still a lack of empirical evidence in the Ethiopian context on exploring how depression and substance use may occur together among adolescents or influence

each other. The direction of the relationship between depression and substance use is also unclear, whether depression leads to increased substance use, or whether substance use contributes to the onset of depression. Therefore, examining this relationship more closely is very important, especially among adolescents who are in a vulnerable developmental period and are more susceptible to emotional and behavioral health problems.

Understanding the strength and direction of the relationship between depression and substance use is very important to design prevention and intervention strategies that are effective and that can simultaneously target both problems. This research seeks to fill that gap by exploring the comorbidity as well as the nature of the relationship between depression and substance use among high school students in Addis Ababa.

1.3 Research questions

As stated on the research topic the major question that this study will attempt to answer is

1. What is the prevalence of depression among high school students in Addis Ababa?
2. What is the prevalence of substance use among high school students in Addis Ababa?
3. Is there a relationship between depression and substance use among high school students in Addis Ababa?
4. Are there significant differences in depression symptoms among high school students in Addis Ababa based on socio-demographic factors such as gender, family income levels, and parental education?
5. Are there significant differences in substance use levels among high school students in Addis Ababa based on socio-demographic factors such as gender, family income levels, and parental education?

1.4 objectives of the study

The general objective of the study is to examine the relationship between depression symptoms and substance use among high school students in Addis Ababa.

Specific objectives of the study are

- To assess the prevalence of depression symptoms among high school students in Addis Ababa.
- To assess the prevalence of substance use (e.g., alcohol, khat, cigarettes, etc.) among high school students in Addis Ababa.
- To examine the relationship between levels of depression symptoms and substance use among students.
- To explore whether socio-demographic factors (such as sex, age, and family background) influence depression symptoms or substance use.

1.5 Significance of the study

Adolescents are more susceptible to mental health problems as well as being involved in various risky behaviors such as substance use this is because adolescence is a developmental stage that is critical and often marked by emotional vulnerability and experimentation. In recent years, studies conducted in different countries of the world has consistently shown evidences for strong relationship between depression and substance use among adolescents (Swendsen & Merikangas, 2020). However, in the Ethiopian context particularly among high school students in Addis Ababa, the relationship between depression and substance use has not been well studied; because of this there is a significant gap in both academic understanding as well as practical intervention to address the issue.

This study explored how substance use may be connected to having depression symptoms among high school students. Understanding this relationship is important for teachers, mental health professionals, school counselors, and policy-makers who are attempting provide effective response to the growing concerns around mental health problems among adolescents and emerging adults. This study could also help design a school-based prevention strategies and early intervention programs that are more targeted and evidence-based, by identifying patterns of co-morbidity between depression and substance use.

Additionally, the findings of this study could help raise awareness among parents and teachers about the importance of emotional well-being in adolescence and also serve as a foundation for future research in adolescent mental health in Ethiopia, especially considering the unique cultural, economic, and educational context of students in urban settings like Addis Ababa.

In conclusion, the aim of this study was to contribute to the academic field and also to support efforts to create safer, more supportive learning environments where the mental health of students is prioritized alongside their academic success.

Prior to data collection, the necessary permissions was secured from the Addis Ababa City Education Bureau, the Bole Sub-City Education Office, and the administrations of the schools involved in the study.

1.6 Operational definition of terms

Depression

In this study depression refers to the severity of the self-reported depression symptoms as assessed by the Beck Depression Inventory-II (BDI-II).

Substance Use

Substance use in this study refers to self-reported use of one or more of the following substances in the past 12 months; these are Cigarettes (use of tobacco), Alcohol (drinking any alcoholic beverages and Cannabis (use of marijuana in any form); The frequency, pattern, and recency of use will be assessed through ASSIST.

1.7 Limitations of the Study

This study was not without limitations. Data were gathered only from government high schools in Bole Sub-City, which limits the generalizability of the findings to other schools or populations in Addis Ababa. The study also relied on self-report questionnaires, which may have been influenced by social desirability bias or inaccurate responses from participants. In addition, time and resource constraints restricted the use of qualitative methods that could have provided more detailed insights into students' experiences and perceptions.

1.8 Delimitations of the Study

This study was delimited to government high school students in Bole Sub-City, Addis Ababa. It focused specifically on students enrolled in grades nine through twelve. The research examined only three types of substances; tobacco, alcohol, and marijuana and investigated their relationship with depression symptoms. Other psychological, social, and environmental factors were excluded from the scope of the study. Moreover, the study employed quantitative methods using standardized instruments, namely the Beck Depression Inventory-II (BDI-II) and the World Health Organization Alcohol, Smoking, and Substance Involvement Screening Test (WHO ASSIST).

Chapter two

Literature Review

2.1. Overview

Depression and substance use are among the common mental health problems that are observed globally. Most of the time a person who uses substance is observed to be depressed; similarly a depressed person has a higher tendency to use substance in comparison to a person who is not depressed (Vogel, et al., 2003). This implies that there is a probability that there might be a relationship between these two psychological problems. However the strength and nature of this relationship is ambiguous (Audrain-McGovern, et al., 2009).

2.2 Types and prevalence of substance use in adolescence period

Although substance use is not as common as depression, it has affected more than 200 million people worldwide (Peacock, 2018). Substance use includes both illegal and socially unacceptable substances and the common, socially accepted legal substances (Kebede, 2009). It is considered a psychological disorder when the individual shows physiological, behavioral, affective, and cognitive symptoms indicating problems related to use, yet persists in using (APA, 2013). Cigarettes (tobacco) and alcohol are the most commonly used substances among adolescents, likely due to availability, legality, and social acceptance. Cannabis is less common but still used by a significant number of adolescents; its illegality limits its prevalence compared to cigarettes and alcohol. Even though legal age for alcohol and tobacco is typically 21, widespread adolescent use persists.

2.3. Theories of substance use in adolescence

There are many theories that explain substance use disorder. Among these theories few are discussed below.

The gateway drug theory

The gateway drug theory suggests that when a person starts using the socially accepted common drugs, the probability of the person using the socially unacceptable, illicit drugs is much higher than a person who doesn't use any type of substance (Kirby & Barry, 2012). A research has indicated that even though not every teenager who smokes cigarette progresses to the use of illicit drug such as cocaine, there is strong evidence that suggests higher probability of progression from using licit substance to the illicit ones (Lindsay & Rainey, 1997). The suggested cause for this phenomenon is that when adolescents use legal substance such as tobacco regularly leads the adolescents to develop and learn a behavior and skill to master the use of illicit drugs such as cannabis; because both drugs are administered by similar behavior smoking (Lindsay & Rainey, 1997).

The stepping stone theory

In a similar way as the gateway drug theory, the stepping stone theory suggests that if a person is using one substance, there is high probability that the person might also be using other substances (Whelan, 1995, as cited in Bonora, 2020).

The stage theory of substance

Another theory that explains substance use is the stage theory of substance. This theory states that at the starting point the individual most probably uses legal drugs which mean the first stage

of substance use is using licit drugs and later on the person progresses to the next stage, the use of illicit drugs (Bonora, 2020).

Although the three theories discussed above explain the reason of the use of multiple substances, the explanation for the use of the first substance at the first place is vague. The self derogation theory of substance use suggests that devaluing and rejecting oneself as well as having low self esteem leads to deviant behavior such as substance use (Kaplan, et al., 1984).

2.4. Factors contributing to substance use

There are different factors that contributes to adolescents using substances and being involved in such kind of behavior. Among these factors a culture that is not against substance use, easier accessibility to substances, curiosity to experiment with substance, growing up in a family where parents or older siblings are involved in substance use and having a peer group with members who are involved in substance use and that influences to use substances are the commonly reported ones (Petraitis, et al., 1995). Moreover adolescents who had been abused physically, emotionally and sexually are more vulnerable to substance use (Kilpatrick, et al., 2000). No matter what the reason is for the use of substances, being involved in using substances has serious effect on the individual.

2.5. Theories of depression

Depression is among the common, regularly experienced (Abdullah, et al., 2019) but disabling and serious mental health problem that leads to reduced cognitive as well as physical functioning of the individual (Alzoubi, et al., 2018). A continuously occurring or existing experience of feelings of sadness and the inability to enjoy activities that were once pleasurable is considered as depression (Ralph, 2004) where as in another literature depression is defined by the

distinctive features that characterize the problem such as feelings of being unloved and unwanted, pessimistic and hopeless thought about the future, unhealthy guilt and feelings of disappointment and sadness over something that the person has done or has failed to achieve (Abdullah, et al., 2019).

Depression is a psychological problem that has affected more than 300 millions around the world (WHO, 2017). Even though individuals at different ages and both sexes could be affected by depression (Gashaw, 2015), statistics indicate that prevalence of life time depression in women is reported to be more than twice than that of in men (Abdullah, et al., 2019).

In addition to these definitions, there are different theories that attempt to explain depression. Among these theories, behavioral theory of depression, cognitive theory of depression, learned helplessness theory of depression and psychoanalytic theory of depression are discussed below.

The behavioral theory of depression

According to behaviorism, every behavior of an individual is learned through the direct involvement, relation, contact and association between the individual and the environment. The learning process is facilitated by reinforcement and punishment which are responses for the particular behavior. Based on this, the behavioral theory of depression states that depression is a learned behavior as any other behavior (Gashaw, 2015). Moreover this theory suggests that the learning of this behavior is facilitated by different changes in the environment that hinder and restrain reinforcement. This inhibition of reward leads to the development of different symptoms of depression (Carvalho & Hopko, 2011). On the other hand being positively reinforced for depressive symptoms manifested by an individual might lead to the persistency of those symptoms and consequently leading to depression (Nemade, et al., 2007 cited in Gashaw, 2015).

The psychoanalytic theory of depression

For the psychoanalysts, the sources of psychopathology are intra psychic conflicts and the feelings and thoughts that are repressed in the unconscious (Nemade, et al., 2007 as cited in Gashaw, 2015). Based on this depression is commonly explained by repressed anger and frustration that is directed to oneself (Busch, 2009). The well known psychologist Freud explained depression as a phenomenon that occurs as a consequence to real or imagined loss encountered by the individual (Freud, 1917 cited in Busch, 2009). This perceived loss leads to suppression of anger and frustration (Freud 1917 cited in Robertson, 1979)

The two theories that are discussed above are different in explaining what causes depression; while the behavioral theory of depression majorly focuses on the changes in the environment as a cause of depression, the psychoanalytic theory of depression suggests that repressed and unconscious anger causes depression. On the contrary to these theories the cognitive theory states that cognitive factors cause depression. The cognitive theory of depression is discussed below.

The cognitive theory of depression

Cognition has a very significant role in triggering depression as well as the maintenance of depressive symptoms (Lemoult & Goltib, 2019). The cognitive theory of depression suggests that excessive negative perception about oneself, hopeless and pessimistic thought about the future and generally negative and depressive thinking are the causes of depression (Haaga, et al., 1991). The cognitive theory of depression was developed by Aaron T. Beck more than half a century ago (Lemoult & Goltib, 2019). Beck proposed that since the cognitive symptoms of depression precede the emotional, behavioral or somatic symptoms; the cognitive factors

associated with depression are causes rather than symptoms that characterize the problem (Allen, 2003). This implies that dysfunctional perception and interpretation of stimulants lead to increased occurrence and persistency of depressive symptoms (Abela & D'Alessandro, 2002).

The cognitive theory of depression highly opposes the behavioral theory of depression because this theory insists that the cognitive processes such as perception and interpretation of events play significant role in development of depression than the experience and reinforcement or punishment associated with the experience.

The helplessness theory of depression

Being unable to control trauma, leads to learned helplessness (Seligman, 1972). Understanding the inability to control trauma leads to decreased or no response to the situation and high emotional stress (Seligman, 1972). Although the subjects in the testing of the learned helplessness theory were animals, the behavioral response of the animals can be related to maladaptive behaviors manifested in human beings (Seligman, 1972). Based on this the maladaptive behavior depression has many similarities with the learned helplessness behavior observed in the animals (Seligman, 1972). A study suggested that depression can justifiably modeled by learned helplessness (Miller & Seligman, 1975). Feelings of helplessness, hopelessness and reduced self worth are characteristics that are common to depression and learned helplessness (Seligman, 1972).

Among the theories of depression, the cognitive theory is better in explaining the cause of depression. Two individuals who went through identical trauma could respond to the situation differently. This is explained by the different perception and interpretation of the situation by the individuals. This phenomenon is only explained by the cognitive theory of depression. Besides,

the cognitive theory of depression does not neglect the fact that adverse childhood experiences also have role in the vulnerability of a person to depression (Lemoult & Goltib, 2019).

The theories discussed above are among the many theories that attempt to explain depression. This is because understanding the problem is the first step in minimizing the serious impacts that depression has on the everyday life of individuals. Depression affects different aspects of one's life. Among the major effects of depression few are listed below. Depression not only leads to poor academic performance but also causes long term difficulties in learning (Sharpley & Bitsika, 2013). Moreover, the fourth top cause of death in adolescents, suicide, is positively correlated with depression which means when depression rates increase among adolescents so as suicide rates (WHO, 2021). Besides depression is the major cause of impairment in functioning of everyday life of adolescents (Ahuvia, et al., 2021).

2.6. Depression and substance use

There are many substances that are linked with depression. Among these cigarette (tobacco) and alcohol are the common ones whereas cannabis is less common but still used by significant number of adolescents. The reason for common use of alcohol and cigarette might be the availability, legality and social acceptance of these substances. Even though the legality of these substances is limited to individuals who are above the age of 21, there is a widespread use of these substances among adolescents. However the use of cannabis is limited compared to the use of cigarette and alcohol because the use of the substance is illegal for the total population. For the purpose of practicability this study mainly focuses on the relationship between depression and cigarette smoking, the relationship between depression and alcohol use problems and the relationship between cannabis use and depression.

Depression and smoking

Among the major causes of disability, morbidity and mortality around the world, smoking cigarettes and depression are the common ones (Weinberger et al., 2017). Different studies have been conducted to examine the relationship between depression and smoking (Weinberger et al., 2017). The results of these studies indicate that the rate of current smoking status of depressed adolescents were higher than those adolescents who were not depressed (Weinberger et al., 2017) and the adolescents who are involved in cigarette smoking are almost twice as likely to encounter depression as adolescents those who do not smoke (Goodman & Capitman, 2000). Strong evidence that indicate the co morbidity of depression and cigarette smoking is available. The statistical data regarding the co morbidity of depression and cigarette smoking estimated that the co morbidity of the two variables ranges from 20% - 65% (Morrell & Cohen, 2006). However the reason for the co morbidity between depression and cigarette smoking is not clearly established (Munafo & Araya, 2010).

Although most studies do not explain the nature and direction of the relationship between smoking cigarette and depression, there are few articles that have different conclusion on the issue. A study claims that depression is not the precursor for involvement in cigarette smoking but smoking cigarette is a factor that is indicator for developing depression in the future (Goodman & Capitman, 2000). Even though smoking occasionally might have antidepressant effects chronic cigarette smoking increases vulnerability of an individual to depression (Munafo & Araya, 2010). Furthermore there is another study that agrees with the article mentioned above. This study strongly claims that there is a causal relationship between depression and smoking (Boden, et al., 2010).

However, both studies attempted to support the claim without using experimental research design. In order to proof a causal relationship between two variables, a researcher needs to use experimental research design but for the current case using experimental research design would not be possible because of the ethical issue (Munafo & Araya, 2010). Since it is not possible to purely establish causal relationship without using experimental research design, the conclusion of cause and effect relationship between the two variables would be doubtful. On the contrary to these studies, another study claims that there is no relationship between smoking and depression among adolescents (Khademalhosseini et al., 2015).

There are different propositions that attempt to explain the relationship between depression and smoking cigarette smoking. These are

1. When a person is depressed or has symptoms of depression, the individual is more liable to begin cigarette smoking (Morrell & Cohen, 2006).
2. Being addicted to cigarettes precedes from depression and having depressive symptoms (Morrell & Cohen, 2006).
3. The relationship between depression and cigarette smoking is a corresponding relationship (Morrell & Cohen, 2006).
4. The relationship between smoking cigarettes and depression is not marked by cause and effect relationship (Morrell & Cohen, 2006).

The difficulty in explaining the nature, direction and strength rises because the issue is paradoxical. The paradox is that even though there are evidences that state smoking cigarette as a cause for depression or at least prior existence of smoking cigarettes before depression, most

smokers claim that the reason for smoking is that the need to decrease the negative effects of depression (Munafo & Araya, 2010).

Physiologically, the relationship between depression and cigarette smoking can be explained by the common neurological factors associated with both problems; depression is linked with decreased level of secretion and release of serotonin in the brain (Coppen & Doogan, 1988) where as nicotine, the common chemical that exists in cigarettes facilitates and increases the release of serotonin in the brain (Audrain-McGovern & Benowitz, 2011). This implies the temporary antidepressant effects of cigarette smoking. Therefore people might use cigarettes to decrease or alleviate depressive symptoms.

The different studies mentioned above present different and contradictory conclusions about the very nature of the relationship between depression and cigarette smoking. Besides, there are also differences in the claims about the direction and strength of the relationship. This implies there is a need for further investigation on the issue.

Depression and alcohol use disorder

Alcohol is a substance that has a high possibility of causing dependency. The substance affects the mind and has serious harmful effects on the body (WHO, 2021). Alcohol use disorder is the most prevalent substance use disorder. Disorders related to alcohol use are usual and typically occurring psychological problem mostly in developed countries (Schuckit, 2009). Harmful alcohol use is a cause for approximately 3 million deaths worldwide every year which accounts for almost 5.3% total deaths in each year (WHO, 2021). Besides alcohol use is associated with 5.1% of the total health problems, morbidity and mortality that occur around the world each year

(WHO, 2021). The prevalence of alcohol use disorders is much higher among men than that of women (Schuckit, 2009).

Alcohol dependency, alcohol abuse and dangerous alcohol use are commonly encountered alcohol use disorders (Schuckit, 2009). Alcohol use disorder is associated with lifelong biological and social problems as well as problems at the time of drinking such as intoxication (Rehm et al., 2004). Harmful alcohol use is a cause for many psychological and physical problems as well as sudden injuries and accidents (WHO, 2021).

Even though the lowest legal age at which an individual can get involved in or participate in any kind of alcohol use activity is 21, substantial number of adolescents are involved in this activity (O'Malley, et al., 1998). Another recent study also claims that the period of adolescence has been characterized by increasing rates of alcohol use (Lees, et al., 2020). Among the different hypothesis about causes of alcohol use in adolescence, alcohol use in the peer group of the adolescent is the common one.

Adolescents who are in a peer group with members involved in alcohol use are likely to be engaged in such activity (Oetting et al., 1989 cited in Curran et al., 1997). Nevertheless there is also another possible explanation; adolescents who are involved in alcohol or other substances are liable to initiate and establish friendships with other adolescents who are also substance users (Farrell, 1994 cited in Curran et al., 1997).

Even if drinking alcohol before the age of 21 is illegal in many countries in the world, many adolescents are still involved in the activity (Lees, et al., 2020). Using alcohol at adolescence has serious impact on the individual. Poorer cognitive functioning, brain structure and construction change, depressive symptoms at the attempt of ceasing, long term medical and psychological

problems are among the consequences of adolescent alcohol use (Lees, et al., 2020). Problematic alcohol use in adolescence is often linked with depression.

Alcohol use and depression are among the major psychological problems that simultaneously occur in adolescents. Despite the illegality of drinking alcohol in adolescence, being involved in alcohol use activities is common among adolescents (Galaif et al., 2007). In addition to the problematic alcohol use, adolescents are vulnerable to depression. The co morbidity of these two problems maximizes the negative effect that is encountered by the adolescents (Galaif et al., 2007).

The co morbidity of depression and alcohol use disorder imposes serious problems. Among these problems suicide is the major one. Suicide is ranked forth from the dominant causes of death in adolescence (Galaif et al., 2007).when an individual is encountering depression and alcohol use disorders simultaneously, the risk of attempted suicide is twice higher than having only depression and seven times higher than having alcohol use problems only (Briere et al., 2013). A study concluded that nine out of ten adolescents who attempted suicide or who were suicidal had alcohol use problems and were depressed (Galaif et al., 2007). Moreover co morbid depression and alcohol use disorders leads to wide range of other psychosocial problems (Briere et al., 2013).

The co morbidity between alcohol use and depression is explained in different ways. A study suggested that although depression cannot be stated as the cause for alcohol use, there is evidence that indicate depression and depressive symptoms appear in advance of alcohol use problems (Dawson & Grant, 1998 cited in Briere et al., 2013). Nevertheless another study argues that alcohol use disorder is the problem that occurs prior to depression and associated symptoms

(Flensburg-Madsen et al., 2009). On the contrary to these studies, another study claims that when the extraneous variables are controlled, there is no clear evidence that indicate association between the two variables (Grant et al., 2009).

There are theories that attempt to explain the co morbidity and relationship between alcohol use and depression. Among these theories the problem behavior theory and the stress-coping theory are discussed below. The problem behavior theory suggests that when adolescents are participating in activities that are problematic such as alcohol use, the vulnerability of those adolescents to different psychological problem is high (Galaif et al., 2007). Alcohol use could either be a contributing risk factor that is associated with depression or a situation that clearly shows the existence of depressive problems (Galaif et al., 2007). On the other hand the stress-coping theory suggests that the inability to adequately and appropriately to cope with stress could lead to depression and alcohol use (Kandel et al., 1991 cited in Galaif et al., 2007).

In a similar way to the relationship between smoking cigarettes and depression, the nature, direction and strength of the relationship between alcohol use problems and depression is not clearly and confidently established yet. Furthermore the studies conducted to investigate the relationship between depression and alcohol use focused more or less on different age group other than adolescence. Therefore conducting further studies on this topic more specifically on adolescents is significant.

To sum up, regardless of the illegality of using any type of drug in adolescence, most of the literatures reviewed indicate that the use of different substances among adolescents is rising. The substances that are currently used by adolescents include substances that are socially and legally acceptable for adults such as cigarette and alcohol and also substances that are illegal for the total

population such as cannabis. Similarly, the literatures also indicate the rates of other mental health problems like depression are also increasing among adolescents. The relationship between depression and smoking is not clearly identified. There are studies that claim causal relationship, positive correlation or no relationship between the two variables. The fact that there is no common ground or agreement between researchers regarding the relationship implies that there is a need for further investigation on the issue. The literatures reviewed about the relationship between alcohol use and depression and the relationship between cannabis use and depression also do not agree on the issue of the nature, strength and direction of the relationship of the variables. Moreover most of these studies were not conducted on adolescents or high school students and finding studies conducted on the topic in Ethiopia is difficult. The co morbidity of these two serious mental health problems is causing problems that are affecting adolescents temporarily or that have long term consequences. Among these suicide is the major problem that is caused by the co morbidity of depression and substance use. Therefore in order to prevent morbidity, mortality and disability associated with depression and substance use in adolescents, conducting studies on the target population and understanding the relationship between the two variables is important.

Depression and cannabis use

Cannabis is a substance that is categorized under psychoactive substances. Worldwide, more than 180 million people use cannabis (WHO, 2021). This substance is illegal but commonly used than that of other illegal substances (Lev-Ran et al., 2014). Most of the time cannabis is administered by smoking the dried and powdered plant (WHO, 2021). Cannabis use disorders have distinctive symptoms. These symptoms can be physiological such as increased heart rate, high appetite and dry mouth that cannot be explained by other physiological conditions or

psychological such as anxiety, impaired judgment immediately or after short period of time after cannabis use (APA, 2013).

Cannabis use has different effects including cognitive impairment, memory impairment (inability to learn or to form short term and long term memory) and decreased attention span. These problems could become chronic when the individual keeps using the substance for extended period of time (WHO, 2021). In addition there is a possibility of developing depressive symptoms due to the cannabinoid effects of cannabis use (Degenhardt et al., 2003).

The disability, morbidity and mortality that are directly or indirectly connected with depression have been increasing lately (Gobbi, et al., 2019). Even though the cause of depression is not clearly stated there are different factors causally linked to the problem. Cannabis use disorder is among the factors that has causal link with depression (Gobbi, et al., 2019)

A study proposes a hypothesis that attempts to explain the causal link between the two variables by the effect of cannabis on neurotransmitters that regulate state of emotion such as serotonin. However, this hypothesis is not supported by experiment (Degenhardt et al., 2003). The other plausible explanation for the causal link is that excess use of cannabis may indirectly cause depression by weakening the psychological process of adaptation (Degenhardt et al., 2003). Furthermore evidence supports that, adolescents who use cannabis are liable to be depressed in the years of early adulthood (Degenhardt et al., 2003).

On the contrary to these studies, there is a study that concluded individuals who are depressed or who have depressive symptoms are highly vulnerable to cannabis use disorders (Pacek, et al., 2013). This is explained by the self medication hypothesis. The hypothesis suggests that people use cannabis as a means to alleviate depressive symptoms and to make better their state of

emotion (Degenhardt et al., 2003). Another study claims that consuming excess cannabis is positively correlated with depression which indicates that both cannabis use and depression move or vary in the same direction (Pacheco-Colon, et al., 2019).

While the studies and hypotheses mentioned above attempt to either explain or find causal link between cannabis use disorder and depression, another study that concluded there is no available proof that indicate a causal link between cannabis use and depression (Hodgson et al., 2019). This study supports the hypothesis that states the co-occurrence of depression and cannabis use does not imply the presence of any relationship. The co morbidity can be explained by common factors that could precipitate or contribute to the cause of both problems (Degenhardt et al., 2003).

Most of the studies mentioned above lack strong evidence regarding the relationship between cannabis use and depression or attempt to explain the relationship by proposing different hypotheses. However the explanation of the relationship by the presence of shared risk factors between depression and cannabis use is supported by strong evidence (Degenhardt et al., 2003).

2.7. Summary and conceptual framework

In conclusion, among the theories discussed above this study is grounded in Beck's Cognitive Theory of Depression, which states that negative, automatic and distorted thoughts and dysfunctional cognitive processes lead to the development of depressive symptoms. Among high school students, these depressive symptoms may increase vulnerability to substance use, because individuals seek relief from emotional pain. The framework assumes that cognitive distortions lead to depressive symptoms, which in turn influence behavioral outcomes such as substance use.

Factors such as coping mechanisms, peer influence, and family environment may moderate or mediate this relationship.

Chapter three

Methodology

3.1 Study setting

The study was conducted in Bole Sub-City, one of the eleven sub cities in Addis Ababa. since Bole Sub-City is one of the densely populated sub cities that has broad socioeconomic diversity, the sub city provides a suitable and meaningful context for exploring mental health of adolescents and substance use within the city setting.

The data for this study was collected from two government high schools, Bole Senior Secondary School and Lem General Secondary School; selected by using simple random sampling from the full list of high schools in Bole Sub-City. This sampling method gave each high school in the sub city an equal chance to be included in the study, which helped to ensure that the findings were representative and applicable to similar school populations in Addis Ababa.

The selected schools include students from grades 9 to 12, which includes all grades of high school. The expected variation in the socioeconomic and demographic backgrounds of students will contribute to a deeper and more comprehensive understanding of depression symptoms and substance use patterns among adolescents.

3.2 Research design

The major objective of this study was to find out if there is a relationship between depression and substance use among high school students in Addis Ababa. So as to attain the objective of the study the student researcher used correlational research design. Moreover correlational research is the most appropriate research design to determine the presence, direction and strength of a relationship between variables because it enables us to calculate correlational coefficient.

In order to conduct correlational study and calculate correlational coefficient, each variable needs to be measured separately. Therefore to measure each variable survey method was used. Two major reasons can be mentioned to justify this. One of the reasons is that survey method is appropriate when we need to collect data from large number of respondents besides using survey method is preferable when the type of data we need to collect is private.

3.3 Population and sampling

As it is indicated in the research topic, the target population for the current study was high school students in Addis Ababa. To choose a representative sample from the target population, proportional simple random sampling were used.

There are 236 high schools in Addis Ababa. Among these, 85 are government-owned high schools, whereas 151 are private-owned high schools. The total number of students who are enrolled in these schools is estimated to be around 181,068 (Ministry of Education [MoE], 2020). From the total number of the population, the sample size calculated at 95% confidence level and 5% margin of error using the following formula $n_0 = z^2 p(1-p)/e^2$ is 384.

Prior to selecting the students, the data that consist of the list of high schools with their corresponding sub-cities and number of students was obtained from the Addis Ababa City Administration Education Bureau website.

However, instead of selecting schools from all sub-cities, this study focused on Bole Sub-City only. Bole is one of the largest and most diverse sub-cities in Addis Ababa, making it a suitable area for studying adolescent mental health and substance use. From the total number of high schools located in Bole Sub-City, two government high schools were randomly selected; these

two high schools are Bole Senior Secondary School and Lem General Secondary School. The decision to focus on only two schools is based on the need to manage time and resources effectively while still ensuring a diverse sample.

The purpose of selecting government high schools was to include participants from different ranges of socioeconomic status. Then, representative samples from each selected school were drawn according to the number of students enrolled in those schools, and a total of 384 respondents were recruited using a simple random sampling method.

Since simple random sampling method was used to select participants of the study, every high school student who is learning in the selected high schools and present on the day the study was conducted had an equal probability of being selected. However, if a student was not willing to be part of the study, the student was obligated and was excluded from the study.

3.4 Data collection Instruments

The data collection instrument for the current study was a self-administered questionnaire. The questionnaire consisted of three sections. The first section contained questions that assess socio-demographic characteristics such as age, sex and grade level of the participants. The second section contained Beck's depression inventory, a scale which measures depression and the final section contained the world health organization, alcohol, smoking and substance involvement screening test (ASSIST) that measures the existence of substance use.

The Beck depression inventory I (BDI I) was created by Beck, Mock, Mendelsohn, Ward, and Erbaugh in 1961. It was updated to Beck depression inventory II in 1996 by Beck, Brown, and Steer so as it would be consistent with DSM-IV (Gashaw, 2015). The BDI II is a standardized

scale that contains 21 questions. Every question has 4 response items with a correspondent score ranging from 0 to 3.

As its name indicates the Beck depression inventory measures the severity of depression. The maximum sum total that could be obtained by adding the scores of each response is 63. A score from 0 to 3 indicates minimal depression, 4-9 mild depression, 10-19 moderate depression and 20 and above means severe depression (Beck et al., 1996). The reliability score of the scale was mentioned to be 0.89, which infers a high reliability of The BDI I. The relatively recent BDI II has a reliability score of approximately 0.91 (Beck, et al., 1996).

The other scale that was used in this study was the alcohol, smoking and substance involvement screening test (ASSIST). The ASSIST was developed by the world health organization, to be used as a screening tool. The ASSIST consists of 8 items that assess either recent or life time use of substances, dependency or abuse symptoms. Each response given for the questions that are included have scores that represent the answer. Studies indicate that the ASSIST has a reliability (cronbach's Alpha) score of above 0.83 for tobacco, 0.76 for alcohol, and 0.73 for cannabis, which implies the scale is acceptable and has a fairly high reliability score (Tiburcio Sainz, 2016). A study has concluded that the ASSIST scale is reliable and internally consistent psychometric scale to screen substance use (Hides et al., 2009).

The score for involvement in use of a particular substance is calculated by adding the scores of the responses to questions 2 up to 7 for each substance. A score lower than or equal to ten for alcohol and a score lower than or equal to four for the substances other than alcohol shows low risk of substance use disorder, a score between eleven and twenty six for alcohol and a score between four and twenty six for substances other than alcohol indicates moderate risk of

substance use disorder where as a score greater than twenty seven or higher indicated high risk of substance use disorder ,Although the ASSIST scale is prepared to be used in an interview, for the purpose of respecting the anonymity of participants, the scale will be given in self-administered questionnaire format (WHO, 2010).

However since the Beck Depression Inventory II (BDI II) is self-reported (self-administered) questionnaire scale, the score calculated from the scale shows what the individual thinks about the individual's state of depression. Similarly the Alcohol, Smoking and Substance involvement test (ASSIST) is also in self-reported format, which indicates misreporting data about substance involvement by participants of the study might occur. In order to avoid or minimize this self-report bias the aim of the study and the significance of providing accurate information for the purpose of the study will be rigorously explained to the participants of the study.

3.5 Data collection procedures

In advance of starting data collection, letter of support from school of psychology of Addis Ababa University was submitted to each high school that is selected to the study. After getting permission to conduct the study in the schools, the following step was to get informed consent to participate in the study from the students as well as their teachers because they are considered as legal guardians.

After getting consent from both the students and their teachers, the next step was to select students by simple random sampling method. The number of students that was selected from each school was determined by dividing the sample size by the number of high schools selected for the study. The proceeding step was to assemble the selected students in class rooms and distribute the questionnaire.

Both the BDI-II and the ASSIST scales would take a maximum of ten minutes each to complete. Therefore the students will be given 25 minutes to complete the questionnaire. Before starting the students will be instructed to put down and leave the class after finishing filling out the questionnaire. The questionnaires were collected after every student has finished filling out the questionnaire and left the class room.

3.6 Data analysis

At the beginning of the study two different self reported scales that measure depression and substance use separately was administered in the form of self reported questionnaires.

Before calculating the correlation coefficient the first thing to do was measuring each variable separately. By adding the scores of the responses for every item on the BDI II scale the status of depression of each participant was identified. Afterwards from this information the prevalence of depression among high school students in Addis Ababa was computed. The next step was to screen involvement in substance use from the ASSIST scale. By adding the scores of each response, the involvement of each participant for a particular substance or more than one substance was identified. Then from these data the prevalence of substance use among high school students in Addis Ababa was computed. In addition from the ASSIST score prevalence of substance use for each substance on the scale was also computed. The 25th version Statistical Package for the Social Science (SPSS) software was used to manage and analyze the data in the current study. The last step in the data analysis was to find out if there is a relationship between depression and substance use among high school student in Addis Ababa. In order to achieve this, the student researcher calculated the Pearson product-moment correlation. By doing so, the

student researcher was able to determine the existence, strength and direction of the relationship between depression and substance use.

In addition, to examine whether significant differences exist in depression levels (Research Question 4) and substance use (Research Question 5) among adolescents in Addis Ababa based on socio-demographic variables (sex, family income, parental education), inferential statistical tests were employed. Independent samples *t*-tests was used for dichotomous variables (e.g., sex), while one-way analysis of variance (ANOVA) was used for categorical variables with more than two groups (e.g., parental education, income levels).

3.7 Ethical considerations

First of all the objective and the data collection procedure of the research was briefly explained to the students. Since almost all high school students are under the age of 18, the students cannot give consent to be part of the study. Even though the ideal way of getting consent on the behalf of the students was to get a signed consent form the parents of each student, completing this task in a limited time line would be difficult. The reason for this is the difficulty to confidently tell how long each parent would take to read, sign and return the consent form. Therefore, teachers of the students was be asked to give the consent. This is because teachers are considered as the legal guardians of their students. Before giving the consent the objective and procedure of the study was discussed with the teachers. In addition questions raised by the teachers were answered.

Students were also be asked to give their consent to participate in the study. Moreover the students were informed by using written document that briefly explain the objective, the data collection procedure and the rights of participants that if a student does not want to answer a

particular question, the student was allowed to skip the question and any student who wants to drop out of the study was obligated to continue participating.

The other ethical issue that needs to be addressed was the confidentiality of the data collected in the study. Every data that was collected from the participants of the current study was used for the current research purpose only. In addition every single data in the study was accessible to and was processed and analyzed by the student researcher only.

Regarding the issue of anonymity of participants, the questionnaire that was filled in by respondents did not ask name of the student, student identification number, a photograph or anything else that could disclose the identity of the participant by any means. Finally the questionnaires were shuffled before the data analysis process is started so as even the student researcher would not be able to identify the respondent by the sequence in which the questionnaires are collected.

Chapter Four

Findings

The data was collected from 365 high school students in two government high schools in Bole Sub-City. The intended sample size was 384, but the number of participants was reduced due to incomplete data collection forms.

4.1 socio demographic characteristics of participants

Age, gender, grade level, parental education, and income level were the socio-demographic characteristics obtained from the collected data. The participants' average age was 16.02 years (SD = 1.3), with a minimum age of 14 and a maximum age of 19. Among the participants, 202 (55.34%) were male and 163 (44.65%) were female. Regarding grade level of participants, 207 participants were in grade 9, 66 were in grade 10, 28 were in grade 11, and 64 were in grade 12. The socio-demographic characteristics of participants are summarized in the table below.

Table 1

Summary of Socio-demographic Characteristics of Participants (N = 365)

Characteristic	n	%
Age (years)	M = 16.02 (SD = 1.3), Range = 14–19	–
Gender: Male	202	55.34

Gender: Female	163	44.66
Grade 9	207	56.71
Grade 10	66	18.08
Grade 11	28	7.67
Grade 12	64	17.53

4.2 Prevalence of depression symptoms

Depression symptoms of participants were assessed using BDI II; Based on the BDI II scores obtained from the data, the prevalence of depression symptoms among participants was as follows: 160 students (43.83%) have the minimal/no depression symptoms, whereas 76 students (20.82%) have mild depression symptoms, 24 students (6.57%) have moderate depression symptoms, and 105 students (28.76%) have severe depression symptoms. The prevalence of depression symptoms among participants is summarized in the following table.

Table 2

Prevalence of Depression Symptoms (BDI-II; N = 365)

Depression Severity	n	%
Minimal/No	160	43.83
Mild	76	20.82

Moderate	24	6.57
Severe	105	28.76

4.3 Prevalence of Substance use

4.3.1 Tobacco Use

The prevalence of substance use was assessed using the ASSIST substance involvement screening test; according to the ASSIST scores for tobacco use, 327 students (89.6%) were in the low-risk category which indicates one time or no tobacco use; whereas 32 students (8.8%) were in the moderate risk category which indicates risky or harmful use of tobacco and 6 students (1.6%) were in the high risk category which suggests a probable dependent use of tobacco. Overall the prevalence of tobacco use (including one time use) was 10.41 % of the sample.

Table 3

Prevalence and Risk Categories of Tobacco Use Among High School Students (N = 365)

ASSIST Risk Category	Score Range	n	%
Low risk	0–3	327	89.6
Moderate risk	4–26	32	8.8
High risk	27+	6	1.6

Total tobacco users	—	38	10.41
(score > 0)			

4.3.2 Alcohol Use

According to the ASSIST score for alcohol use among the 365 high school students who participated in the study, 87 students (23.8%) reported alcohol use (scores > 0). In terms of risk categories, the majority of students (n = 326, 89.3%) were classified as low risk (scores 0–10), indicating no or minimal use whereas thirty three students (9.0%) were classified in the moderate-risk category (scores 11–26), which indicates harmful patterns of alcohol use, while 6 students (1.6%) were categorized as high risk (scores ≥ 27), suggesting probable dependent use of alcohol. These results indicate that nearly one in four students reported alcohol use, with a small proportion indicating levels of moderate or high risk.

Table 4

Prevalence and Risk Categories of Alcohol Use Among High School Students (N = 365)

ASSIST Risk Category	Score Range	n	%
Low risk	0–10	326	89.3
Moderate risk	11–26	33	9.0
High risk	27+	6	1.6
Total alcohol users	—	39	10.7
(score > 0)			

4.3.3 Marijuana Use

Regarding the prevalence of marijuana use among high school students, 64 students (17.5%) reported use (scores > 0). Most students (n = 301, 82.5%) were in the low-risk category (scores 0–3), which indicates no use. However, the 64 students (17.5%) were categorized as moderate risk (scores 4–26), indicating potentially harmful patterns of marijuana use, while no students scored within the high-risk range (scores ≥ 27).

Table 5

Prevalence and Risk Categories of Marijuana Use Among High School Students (N = 365)

ASSIST Risk Category	Score Range	n	%
Low risk	0–3	301	82.5
Moderate risk	4–26	64	17.5
High risk	27+	0	0.0
Total marijuana users (score > 0)	–	64	17.5

4.4 Depression and substance use

4.4. 1 Depression and Tobacco Use

To examine the nature and strength of the relationship between depression symptoms and tobacco use among high school students, Pearson product moment correlation was conducted. The result indicated a significant, moderate positive correlation between BDI-II scores and tobacco use, $r(365) = .35, p < .001$. This finding shows that students who reported higher levels of depressive symptoms also tended to report higher involvement in tobacco use.

4.4. 2 Depression and Alcohol Use

A Pearson product moment correlation was conducted to assess the nature and strength of the relationship between depression symptoms and alcohol use. The result indicated that there is a significant, moderate positive correlation between BDI-II scores and alcohol use, $r(365) = .30, p < .001$. These findings suggest that students who reported higher levels of depression symptoms also reported higher alcohol involvement.

4.4.3 Depression and Marijuana Use

A Pearson product moment correlation was conducted to assess the nature and strength of the relationship between depression and marijuana use. The result shows that the BDI II scores of participants were also significantly and positively correlated with marijuana use, $r(365) = .31, p < .001$. This positive moderate correlation indicates that students who reported higher depression symptoms were associated with higher marijuana use.

In summary, the Pearson product moment correlation results showed that there is a statistically significant, positive moderate correlations between BDI-II scores and tobacco use, $r(365) = .35$, $p < .001$, alcohol use, $r(365) = .30$, $p < .001$, and marijuana use, $r(365) = .31$, $p < .001$. These findings suggest that students with higher levels of depressive symptoms tended to report greater involvement in tobacco, alcohol, and marijuana use.

Table 6

Pearson Correlations between BDI-II Scores and Substance Use (N = 365)

	BDI-II	Tobacco	Alcohol	Marijuana
BDI-II	1	.349	.303	.306
Tobacco	.349	1		
Alcohol	.303		1	
Marijuana	.306			1

4. 5 Gender Differences in Depression

To compare the depression scores between males and females an independent-samples t test was conducted. The results indicated that females ($M = 24.66$, $SD = 15.25$) reported significantly higher BDI-II scores than males ($M = 16.66$, $SD = 14.36$), $t(363) = -5.15$, $p < .001$. This shows that gender was a significant factor in depression severity.

Table 7

Independent Samples t-test for BDI-II Scores by Gender (N = 365)

Gender	N	Mean	SD	t(df)	p
Male	202	16.66	14.36		
Female	163	24.66	15.25		
t-test				-5.15 (363)	< .001

4.6 Family Income and Depression

The difference in depression by family income level (low, medium, high) was examined by conducting one-way ANOVA. The analysis revealed that severity of depression symptoms differ significantly by levels of family income; $F(2, 362) = 98.03, p < .001$.

Table 8

One-Way ANOVA of Income Level and BDI-II Scores

Source	SS	df	MS	F	p
Between Groups	29,836.48	2	14,918.24	98.03	< .001
Within	55,088.73	362	152.18		

Groups

The Post hoc comparisons conducted using Games-Howell tests indicated that all three income groups significantly differed in BDI-II scores; students from low-income families ($M = 32.03$, $SD = 13.25$) and high-income families ($M = 42.00$, $SD = 5.60$) reported significantly higher depression than those from medium-income families ($M = 14.93$, $SD = 12.54$), $p < .001$. These results suggest that both low and high levels of income were associated with higher depression symptoms.

Table 9

Games–Howell Post Hoc Comparisons of Income Level and BDI-II Scores

(I)	(J)	Mean	Std. Error	Sig.	95% CI	95% CI
Income	Income	Difference			Lower	Upper
		(I-J)				
Low	Medium	17.10	1.74	< .001	12.96	21.23
Low	High	-9.97	1.91	< .001	-14.52	-5.43
Medium	Low	-17.10	1.74	< .001	-21.23	-12.96
Medium	High	-27.07	1.34	< .001	-30.30	-23.84
High	Low	9.97	1.91	< .001	5.43	14.52

High	Medium	27.07	1.34	< .001	23.84	30.30
------	--------	-------	------	--------	-------	-------

4.7 Parental Education and Depression

To assess the effect of parental education level (reading and writing, high school, bachelor's degree, and master's degree or higher) on depression scores measured by the Beck Depression Inventory-II (BDI-II), one way ANOVA was conducted. The result shows that there is a significant difference among the four groups, $F(3, 361) = 29.65, p < .001$.

Table 10

One-Way ANOVA of Education Level and BDI-II Scores

Source	SS	df	MS	F	p
Between Groups	16,789.38	3	5,596.46	29.65	< .001
Within Groups	68,135.83	361	188.74		
Total	84,925.21	364			

Post hoc comparisons using the Games–Howell test revealed significant differences in BDI-II scores between several education groups. Participants with only reading and writing ability reported significantly higher depression scores than those with a high school education ($p = .019$), a bachelor's degree ($p < .001$), and a master's degree or higher ($p = .005$). Differences were also

observed between the high school group ($M = 22.01$, $SD = 10.05$) and bachelor's degree group, $p < .001$. Overall, higher parental education was associated with lower depression levels.

Table 11

Games–Howell Post Hoc Comparisons of Education Level and BDI-II Scores

(I)	(J)	Mean	Std. Error	Sig.	95% CI	95% CI
Education	Education	Difference			Lower	Upper
		(I-J)				
Reading & Writing	High School	6.29	2.13	.019	0.75	11.82
Reading & Writing	Bachelor's Degree	16.81	2.12	< .001	11.30	22.31
Reading & Writing	Master's Degree +	10.29	2.88	.005	2.60	17.98
High School	Reading & Writing	-6.29	2.13	.019	-11.82	-0.75
High School	Bachelor's Degree	10.52	1.28	< .001	7.20	13.84
High School	Master's Degree +	4.01	2.33	.339	-2.52	10.53

Bachelor's Degree	Reading & Writing	-16.81	2.12	< .001	-22.31	-11.30
Bachelor's Degree	High School	-10.52	1.28	< .001	-13.84	-7.20
Bachelor's Degree	Master's Degree +	-6.51	2.32	.050	-13.02	0.00
Master's Degree +	Reading & Writing	-10.29	2.88	.005	-17.98	-2.60
Master's Degree +	High School	-4.01	2.33	.339	-10.53	2.52
Master's Degree +	Bachelor's Degree	6.51	2.32	.050	0.00	13.02

4.8 Gender Differences in Substance Use

To examine the gender difference in substance use, Independent-samples *t* tests were conducted. For tobacco, males ($M = 1.39$, $SD = 5.29$) reported higher use than females ($M = 0.66$, $SD = 2.13$), but the difference was not significant, $t(363) = 1.66$, $p = .098$. Similarly, no significant gender differences were found for alcohol use, $t(363) = 0.57$, $p = .571$, or marijuana use, $t(363) = 1.59$, $p = .113$. These results suggest that substance use patterns among students did not significantly differ between males and females.

4.8.1 Gender Difference in Tobacco use

An independent-samples t-test was conducted to compare tobacco use between males and females. The analysis showed that males ($M = 1.39$, $SD = 5.29$) reported slightly higher tobacco use than females ($M = 0.66$, $SD = 2.13$), but the difference was not statistically significant statistically at $\alpha = .05$, $t(363) = 1.66$, $p = .098$.

Table 12

Group Statistics for Tobacco Use by Gender

Gender	N	M	SD	SE
Male	202	1.39	5.29	0.37
Female	163	0.66	2.13	0.17

Table 13

Independent-Samples t-test for Tobacco Use by Gender

Gender	N	Mean	SD	t(df)	p
Male	202	1.39	5.29		
Female	163	0.66	2.13		
t-test				1.66 (363)	.098

4.8.2 Gender difference in Alcohol Use

An independent-samples t-test was conducted to compare alcohol use between males and females. The result showed that there is no significant difference in alcohol use between males ($M = 2.94$, $SD = 7.06$) and females ($M = 2.56$, $SD = 5.21$), $t(363) = 0.57$, $p = .571$.

Table 14

Group Statistics for Alcohol Use by Gender

Gender	N	M	SD	SE
Male	202	2.94	7.06	0.50
Female	163	2.56	5.21	0.41

Table 15

Independent-Samples t-test for Alcohol Use by Gender

Gender	N	Mean	SD	t(df)	p
Male	202	2.94	7.06		
Female	163	2.56	5.21		
t-test				0.57(363)	.571

4.8.3 Gender difference and Marijuana Use

An independent-samples t-test was conducted to compare marijuana use between males and females. The results indicate that males ($M = 3.33$, $SD = 6.99$) reported slightly higher marijuana use than females ($M = 2.27$, $SD = 5.46$), but the difference was not statistically significant, $t(363) = 1.59$, $p = .113$.

Table 16

Group Statistics for Marijuana Use by Gender

Gender	N	M	SD	SE
Male	202	3.33	6.99	0.49
Female	163	2.27	5.46	0.43

Table 17

Independent-Samples t-test for Marijuana Use by Gender

Gender	N	Mean	SD	t(df)	p
Male	202	3.33	6.99		
Female	163	2.27	5.46		
t-test				1.59(363)	.113

4.9 Parental Education and Substance use

4.9.1 Parental Education and Tobacco Use

A one-way ANOVA was conducted to examine the effect of parental education in tobacco use.

The result revealed a significant effect of parental education on tobacco use, $F(3, 361) = 4.00$, $p = .008$, $\eta^2 = .03$.

Table 18

Descriptive Statistics of Tobacco Use by Parental Education

Parental Education	N	M	SD	SE	95% CI (Lower–Upper)	Min	Max
Reading and Writing	109	1.57	2.96	.28	1.01 – 2.13	0	15
High School	120	1.70	6.61	.60	0.51 – 2.89	0	30
Bachelor's Degree	121	0.10	0.63	.06	–0.01 – 0.21	0	4
Master's Degree and above	15	0.00	0.00	.00	0.00 – 0.00	0	0
Total	365	1.06	4.19	.22	0.63 – 1.49	0	30

Table 19

One-Way ANOVA for Tobacco Use by Parental Education

Source	SS	df	MS	F	p
Between Groups	205.93	3	68.64	4.00	.008
Within Groups	6188.74	361	17.14		
Total	6394.67	364			

Post hoc comparisons were conducted using the Games–Howell test showed that students whose parents had a bachelor’s degree ($M = 0.10$, $SD = 0.63$) reported significantly less tobacco use compared to those with parents with reading and writing education (M difference = -1.47 , $p < .001$) and high school education (M difference = -1.60 , $p = .046$). Similarly, participants whose parents had a master’s degree or above ($M = 0.00$, $SD = 0.00$) reported significantly less tobacco use compared to those with reading and writing education (M difference = -1.57 , $p < .001$) and high school education (M difference = -1.70 , $p = .029$). No significant difference was found between reading and writing and high school groups ($p = .997$), nor between bachelor’s degree and master’s degree and above groups ($p = .304$).

Overall, the results suggest that higher parental education is associated with lower tobacco use among participants.

Table 20

Games–Howell Post Hoc Test for Tobacco Use by Parental Education

(I) Education	(J) Education	Mean Difference (I–J)	SE	p	95% CI (Lower–Upper)
Reading & Writing	Bachelor's Degree	1.47	.29	.000	0.72 – 2.22
Reading & Writing	Master's Degree+	1.57	.28	.000	0.83 – 2.31
High School	Bachelor's Degree	1.60	.61	.046	0.02 – 3.18
High School	Master's Degree+	1.70	.60	.029	0.13 – 3.27
Bachelor's Degree	Master's Degree+	–0.10	.06	.304	–0.25 – 0.05
Reading & Writing	High School	–0.13	.67	.997	–1.86 – 1.60

4.9.2 Parental Education and Alcohol Use

To assess the difference in alcohol use by parental education one-way ANOVA was conducted.

The result indicated significant differences in alcohol use by parental education, $F(3, 361) = 5.77$, $p = .001$.

Table 21

Descriptive Statistics of Alcohol Use by Parental Education

Parental Education	N	M	SD	SE	95% CI (Lower–Upper)	Min	Max
Reading and Writing	109	4.39	6.53	.63	3.16 – 5.63	0	23
High School	120	3.08	8.23	.75	1.60 – 4.57	0	35
Bachelor’s Degree	121	1.35	3.04	.28	0.80 – 1.89	0	9
Master’s Degree and above	15	0.00	0.00	.00	0.00 – 0.00	0	0
Total	365	2.77	6.30	.33	2.12 – 3.42	0	35

Table 22

One-Way ANOVA for Alcohol Use by Parental Education

Source	SS	df	MS	F	p
Between Groups	659.50	3	219.83	5.77	.001
Within Groups	13764.63	361	38.13		
Total	14424.13	364			

Post hoc comparisons showed that participants with parents having only reading and writing skills ($M = 4.39$, $SD = 6.53$) reported consuming significantly more alcohol than those with parents holding a bachelor's degree ($M = 1.35$, $SD = 3.04$) or a master's degree and above ($M = 0.00$, $SD = 0.00$), $p < .001$. Overall, these findings suggest that lower parental education is associated with higher alcohol use among participants.

Table 23

Games–Howell Post Hoc Comparisons of Alcohol Use by Parental Education

Comparison	Mean	SE	p	95% CI
	Difference			(Lower–Upper)
Reading & Writing – High School	1.31	.98	.537	-1.22 – 3.84

Reading & Writing – Bachelor's	3.05	.68	.000	1.27 – 4.82
Reading & Writing – Master's+	4.39	.63	.000	2.76 – 6.03
High School – Bachelor's	1.74	.80	.137	-0.34 – 3.82
High School – Master's+	3.08	.75	.000	1.13 – 5.04
Bachelor's – Master's+	1.35	.28	.000	0.63 – 2.07

4.9.3 Parental Education and Marijuana Use

A one-way ANOVA was conducted to assess marijuana use by parental education. The result shows that there is no significant differences in marijuana use across parental education levels, $F(3, 361) = 1.20, p = .310$. Thus, parental education did not appear to influence marijuana use among participants. Therefore, post hoc comparisons were not further conducted.

Table 24

Descriptive Statistics for Marijuana Use by Parental Education

Parental Education	N	Mean	Std. Deviation	Std. Error	95% CI Lower Bound	95% CI Upper Bound	Range
Reading and Writing	109	2.66	5.119	0.490	1.69	3.63	0–16
High School	120	3.20	6.700	0.612	1.99	4.41	0–19
Bachelor's Degree	121	3.05	7.314	0.665	1.73	4.37	0–21
Master's Degree and above	15	0.00	0.000	0.000	0.00	0.00	0–0
Total	365	2.86	6.363	0.333	2.20	3.51	0–21

Table 25

ANOVA Results for Marijuana Use by Parental Education

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	145.249	3	48.416	1.198	.310
Within Groups	14591.343	361	40.419		
Total	14736.592	364			

4.10 Family income and substance use

4.10.1 Family income and Tobacco use

A one-way ANOVA was conducted to examine the effect of family income on tobacco use among high school students. The results showed no statistically significant differences across family income groups, $F(2, 362) = 0.96$, $p = .386$, $\eta^2 = .005$. This suggests that family income does not significantly influence tobacco use in this sample. Therefore, post hoc analysis were not conducted further.

Table 26

One-Way ANOVA for Tobacco Use by Family Income

Source	SS	df	MS	F
Between Groups	33.572	2	16.786	0.955
Within Groups	6361.102	362	17.572	
Total	6394.674	364		

4.10.2 Family Income and Alcohol Use

A one-way ANOVA was conducted to assess the effect of family income on alcohol use among high school students. The analysis revealed a statistically significant effect, $F(2, 362) = 24.22$, $p < .001$, $\eta^2 = .118$, indicating that family income explains approximately 11.8% of the variance in alcohol use.

Table 27

One-Way ANOVA for Alcohol Use by Family Income

Source	SS	df	MS	F
Between	1702.579	2	851.290	24.224

Groups			
Within Groups	12721.547	362	35.142
Total	14424.126	364	

Post-hoc comparisons were conducted using the Games-Howell test, the results revealed that there are significant differences in alcohol use across family income groups. Students from low-income families reported significantly higher alcohol use than those from medium-income families ($p < .001$) and Students from high-income families reported significantly higher alcohol use compared to both low-income ($p = .036$) and medium-income students ($p < .001$). Overall, the pattern indicates that alcohol use increases with family income, with medium-income students reporting the lowest use, low-income students moderate, and high-income students the highest.

Table 28

Games-Howell Post Hoc Comparisons of Alcohol Use by Family Income

(I) Family income	(J) Family income	Mean Difference (I-J)	Std. Error	Sig.	95% CI
Low	Medium	3.437	.850	< .001	[1.42, 5.46]
Low	High	-3.832	1.492	.036	[-7.45, -0.22]
Medium	Low	-3.437	.850	< .001	[-5.46, -1.42]

Medium	High	-7.269	1.321	< .001	[-10.53, -4.01]
High	Low	3.832	1.492	.036	[0.22, 7.45]
High	Medium	7.269	1.321	< .001	[4.01, 10.53]

4.10.3 Family Income and Marijuana Use

One-way ANOVA was conducted to examine the effect of family income on marijuana use among high school students. The result indicated that there is a statistically significant difference, $F(2, 362) = 16.70$, $p < .001$, $\eta^2 = .085$, in marijuana use among students from different family income levels. The result suggests that approximately 8.5% of the variance in marijuana use can be explained by family income.

Table 29

One-Way ANOVA for Marijuana Use by Family Income

Source	SS	df	MS	F
Between Groups	1244.688	2	622.344	16.698
Within Groups	13491.904	362	37.270	
Total	14736.592	364		

Post-hoc comparisons were conducted using the Games-Howell test indicated that marijuana use did not significantly differ between students from low- and medium-income families ($p = .669$).

However, students from high-income families reported significantly higher marijuana use than both low-income ($p = .001$) and medium-income students ($p < .001$). These results confirm that marijuana use is substantially elevated among high-income students.

Table 30

Games-Howell Post Hoc Comparisons of Marijuana Use by Family Income

(I) Family income	(J) Family income	Mean Difference (I-J)	Std. Error	Sig.	95% CI
Low	Medium	0.648	.757	.669	[-1.15, 2.44]
Low	High	-6.600	1.670	.001	[-10.69, -2.51]
Medium	Low	-0.648	.757	.669	[-2.44, 1.15]
Medium	High	-7.248	1.578	< .001	[-11.15, -3.34]
High	Low	6.600	1.670	.001	[2.51, 10.69]
High	Medium	7.248	1.578	< .001	[3.34, 11.15]

Chapter Five

Discussion

This chapter interprets the major findings of the study, explains whether the results support or reject the null hypothesis, and places results in the context of reviewed literature.

5.1 Prevalence of depression

Results of the current study indicate that the prevalence of depressive symptoms among high school students who participated was statistically significant with more than fifty percent of the population having at least mild depression symptoms.

The high prevalence observed in this study is consistent with prior studies conducted in Ethiopian context as well as international studies. For instance a study conducted among high school students in Northwest Ethiopia reported a substantial proportion of high-school students had depression symptoms(Dachew, Bifftu, & Tiruneh ,2015); the study reported conflict, poor academic performance and low social support as correlates.

However the prevalence of severe depressive symptoms observed among high school students in this study was higher than expected. This elevated rate may be attributed to several interrelated factors. The use of the Beck Depression Inventory–II (BDI-II) as a self-report instrument may have contributed to the higher prevalence observed. While the BDI-II is a reliable and valid screening tool, it captures the subjective intensity of depressive symptoms rather than clinical diagnoses . Consequently, temporary mood fluctuations, situational stress, or test-related anxiety may have inflated reported symptom levels.

Furthermore, the timing of data collection may have influenced the results. the survey coincided with final examination periods of the year which is academically demanding time, students may have reported higher levels of sadness, fatigue, or concentration difficulties; symptoms that overlap with depressive indicators.

5.2 Prevalence of substance use

The null hypothesis of the study states that the prevalence of substance use (tobacco, alcohol, cannabis) among high school students is negligible (is not meaningfully present in this school population). However the results of the current study indicated that the prevalence of lifetime or recent use rates for alcohol, tobacco and marijuana (and the ASSIST-based low/moderate-risk distributions) is statistically significant. There fore, the null hypothesis is rejected.

The study indicated greater prevalence for alcohol and cannabis use relative to tobacco experimenters in this sample, and meaningful proportions of participants are also in moderate-risk ASSIST categories. This findings align with previous studies and global summaries as well. For instance a study conducted among preparatory students indicated that approximately 26.5% lifetime substance use among preparatory students with alcohol, khat and cannabis as prominent substances; a pattern similar to what we observe.

In addition, global studies such as (Peacock et al., 2018) support the expectation that adolescents experiment with licit substances such as alcohol, tobacco and some proceed to illicit substances such as cannabis. The ASSIST reliably identifies low/moderate/high risk. Using ASSIST therefore provides results that are both comparable to the literature and psychometrically defensible.

In general the study shows the presence of moderate-risk substance use . This suggests targeted prevention peer norms, parental engagement in addition to raising awareness.

5.3 The relationship between depressive symptoms and substance use

Assessing the nature and strength of the relationship between depression symptoms and substance was the major objective of the study. The null hypothesis of the study was that there is no association between depressive symptom severity and levels of substance use among the students.

The findings of the study shows a moderate, positive associations between depression symptoms and use of tobacco ($r(365) = .35, p < .001$) , alcohol ($r(365) = .30, p < .001.$) and marijuana ($r(365) = .31, p < .001.$) . These results indicate that even though the correlation is in not very strong, there exists a noticeable and significant positive relationship between depression symptoms and all three substances. There fore the null hypothesis is rejected.

The study findings regarding the co-occurrence and moderate correlations are consistent with multiple previous studies. Systematic and large-scale reviews find co-morbidity and bidirectional links between mood disorders and substance use (Swendsen & Merikangas, 2020; Gobbi et al., 2019), while there are also specific adolescent studies report higher smoking and alcohol use among depressed teens (Goodman & Capitman, 2000; Weinberger et al., 2017).

Depression often contributes to substance use among adolescents by increasing emotional distress and reducing coping ability. Depressed individuals may use substances like cigarettes, alcohol, or cannabis to manage negative emotions, supporting the self-medication hypothesis (Degenhardt et al., 2003; Pacek et al., 2013). Physiologically, low serotonin levels linked to

depression (Coppen & Doogan, 1988) can be temporarily elevated by nicotine or alcohol, creating short-term relief that reinforces continued use (Audrain-McGovern & Benowitz, 2011).

Adolescents with poor coping skills or limited social support are especially vulnerable, as explained by the stress-coping theory (Kandel et al., 1991, cited in Galaif et al., 2007). Evidence also shows that depressed adolescents are more likely to smoke, drink, or use cannabis than their non-depressed peers (Weinberger et al., 2017; Degenhardt et al., 2003).

In summary, depression increases susceptibility to substance use through emotional, psychological, and biological pathways. Early identification and treatment of depressive symptoms are essential to prevent subsequent substance-related problems.

5.4 Differences in depression levels among students by socio-demographic factors (gender, family income, parental education, parental occupation)

This study also attempted to assess socio-demographic factors associated with depression. The null hypothesis of the study was there are no differences in depression levels across categories of the socio-demographic variables (i.e., mean BDI-II scores are equal across gender, income brackets, parental-education categories, and parental-occupation groups). The results of the study indicated statistically significant differences for several socio-demographic factors (e.g., higher BDI-II mean scores among female students; meaningful differences by family income and parental education). Therefore the null hypothesis is rejected for those variables showing significant effects.

The finding that higher depression symptoms were reported by females aligns with well-established adolescent patterns discussed in the literature review (Cyranski et al., 2000;

Harlak et al., 2008). This sex difference is clearly indicated in international adolescent literature and also appears in studies conducted in Ethiopian university/student samples too (Gashaw, 2015).

The study results also indicate that depression varied across income groups including elevated symptoms in some low-income groups. These results also align with the background of the study that socio-economic stressors such as economic hardship, and family stress are important determinants of adolescent mental health (Kiyohara & Yoshimasu, 2009; Dachew et al., 2015).

Regarding the association between parental education and depression, findings indicate that higher parental education is associated with lower adolescent depressive symptoms, this results are consistent with theoretical expectations and empirical reports that are discussed in the proposal. The findings suggest that better-educated parents typically have more resources, higher mental-health literacy, and different parenting practices that buffer adolescents (Grant et al., 2009; Kebede, 2009).

These socio-demographic differences suggest a mixed prevention strategy. These are universal measures (screening for all) and also targeted support for higher-risk subgroups (e.g., female students, families with identified economic strain, low parental education).

5.5 Differences in substance-use levels among students by socio-demographic factors (gender, family income, parental education, parental occupation)

Another objective of the study was to assess the socio-demographic factors that could be associated with substance use among high school students. The null hypothesis of the study was

that there are no socio-demographic differences in substance-use measures (i.e., ASSIST scores and prevalence do not vary by gender, income, parental education or occupation).

The findings of the study shows mixed patterns; some socio-demographic variables such as parental education were significantly associated with tobacco and alcohol involvement while gender differences were not statistically significant for all substances. Therefore, we reject the null hypothesis for those socio-demographic variables showing significant differences such as family income and parental education, and fail to reject the null hypothesis where no differences were found in certain gender comparisons.

As mentioned earlier the gender difference in substance use among participants was not statistically significant this results do not align with some traditional patterns that show higher male use (Tadesse et al., 2020), but is consistent with more recent observations that gender gaps are narrowing in some settings and that local cultural and school contexts matter. The literature review emphasized that substance-use gender patterns in Ethiopia can vary by substance, sub-city and sample selection.

The effect of higher parental education on alcohol and tobacco involvement (observed here) matches expectations from the proposal which is parents with more education often engage in more effective monitoring and have different norms around adolescent substance use (Seid et al. ,2021) and other local studies discussed in the proposal likewise identified parental supervision and family factors as important correlates of adolescent substance use.

However, Substance specific patterns should also be considered. Parental education affected alcohol and tobacco in this sample but not necessarily cannabis, which indicates that illicit drug

use can be more strongly shaped by peer networks and availability than by family background alone (Degenhardt et al., 2003).

Chapter Six

Summary, Conclusions and Recommendations

This final chapter summarizes the study's major findings, draws conclusions about the relationships among depression, substance use, and socio-demographic factors, and presents practical as well as research recommendations based on the findings of the study.

6.1 Summary of key findings

This study investigated the prevalence of depressive symptoms, the prevalence of substance use, differences in the severity of depressive symptoms and substance use across different socio-demographic factors, and the relationship between depressive symptoms and substance use among high school students. The findings are summarized as follows.

The BDI-II was used to assess depressive symptoms among high school students. The findings showed that 28.76% of the participants had severe depressive symptoms, while only 43.83% had minimal or no depressive symptoms. These results indicate a significant prevalence of depressive symptoms in the sample of 365 students from two government high schools in Bole Sub-City.

To assess substance use among participants, the ASSIST screening tool was used. The results showed significant levels of substance involvement. The overall prevalence of tobacco use, including experimentation/one-time use, was 11.5%, whereas the overall use for alcohol and marijuana was 23.8% and 20.8%, respectively. These findings indicate that alcohol and marijuana were the more commonly used substances relative to tobacco in this sample.

The BDI-II scores of participants were positively and moderately correlated with ASSIST substance scores for tobacco, alcohol, marijuana, This indicates there is a co-occurrence of higher depressive symptom severity with greater substance involvement in this sample.

Regarding the gender difference, female participants reported significantly higher BDI-II score means (depression symptoms) than males. However, substance use differences by gender were small and not statistically significant for tobacco, alcohol, or marijuana in this sample.

Depression symptoms (BDI-II scores) varied significantly across income categories with students from middle income families showing lower mean scores in this sample In addition the BDI-II scores mean was higher among students whose parents had lower education; parental education was also protective against alcohol and tobacco involvement. Games–Howell post hoc tests showed significant pairwise differences in BDI-II across parental education categories.

6.2 Conclusions

Over half (56%) of the students who participated in the stud reported at least mild depressive symptoms, and nearly 29% reported severe symptoms. This prevalence is relevant public health concern and calls for action at school levels.

Similarly, substance use is prevalent and potentially harmful for a subset of students. Even though many students who participated in the study fall in low-risk categories, considerable number of participants are in moderate or high ASSIST risk ranges, specifically for alcohol and cannabis, This indicates the risk for current harm and future worsening. The existence of moderate positive correlations between BDI-II scores and ASSIST scores suggest that depressive symptoms and substance involvement are associated in this population. While the study design

prevents causal inference, the pattern emerged in the findings aligns with multiple mechanisms described in the literature review such as self-medication; this also highlights the need for integrated approaches to address the issue.

The findings showed that female students and students from lower parental-education backgrounds are at higher risk for depression and also parental education is related to substance use. However, the presence of depression symptoms and substance use across different family income level as well as parental education suggests universal screening rather than only targeted screening based on certain socio-economic criteria.

The findings of this study aligns with other local Ethiopian studies conducted in different settings and also international studies cited in the literature review. These are meaningful rates of adolescent depression and substance use, the co-morbidity between depression symptoms and substance use, and the socio-demographic determinants such as family income and parental factors which are reflected in the present data. This coherence strengthens the external credibility of the results.

6.3 Recommendations

The recommendations are organized in for categories as follows; a) schools, b) families & community, c) policy & education authorities, and d) future research.

A. For schools and local health services

The recommendation for schools is to conduct brief school-based screening by the collaboration of school psychologists (guidance and counseling office) with local counseling centers. The

screening could be conducted using short BDI-II assessment tool or a validated brief depression screening tool and the ASSIST short forms at key points in the school year entry to high school or for students who are taking national exam (grade 12 students). The screening process should also be linked to immediate, confidential referral pathways for cases that need intervention. The BDI-II and ASSIST have appropriate reliability for screening as discussed in the proposal.

Each school should strengthen their counseling offices and should have access to trained counselors and also an agreed referral system with adolescent-friendly mental-health services. For students in high ASSIST risk or with severe BDI-II scores, schools must provide or expedite access to clinical assessment and interventions.

In addition to screening and referral systems, schools should also have integrated prevention programs that combine mental-health promotion such as coping skills, problem-solving, emotion regulation trainings with substance-use prevention modules including peer norms, refusal skills, accurate information about harms. This Integrated programming addresses the co-occurrence observed in the findings and follows the integrated approach suggested in the proposal.

Providing brief trainings to help staff recognize warning signs of depression and problematic substance use, to respond more empathetically, and follow referral protocols. The involvement of teachers and staff amplifies early detection and reduces stigma.

The Screening and intervention processes at schools must be implemented with clear consent procedures and adhere to confidentiality principles to encourage honest reporting and protect the privacy rights of students.

B. For families and communities

Families and also the community should be engaged to ensure successful prevention and intervention. Parents should be engaged in psychoeducation and similar trainings. In addition parents should also participate in school-based parent workshops that explain adolescent mental health and substance risks, emphasize parental monitoring and communication strategies, and provide information about local resources. The protective role of parental education in this study suggests that parental knowledge and engagement are core points.

Furthermore creating Community awareness and working with local health bureaus and community leaders to reduce stigma around mental health, raise awareness of substance-use harms, and publicize available services for youth.

C. For policy and education authorities

The Addis Ababa city education bureau should incorporate routine mental-health screening and referral systems in high schools that is accompanied by funding for counselors or school psychologists.

The bureau should also establish indicators such as screening coverage, referral uptake, treatment engagement, outcome monitoring to evaluate implementation and outcomes of school mental-health programs.

D. For future research

For future research, school-based interventions for mental-health and substance-use prevention should be piloted and evaluated using appropriate research designs to test the effectiveness in reducing depression symptoms and risky substance use.

The study should also be replicated across additional sub-cities, private schools, and rural settings; and incorporate qualitative research to explore why some groups such as higher income students in some analyses show higher depression symptoms and to understand help seeking barriers.

7. References

- Abdullah, I., Hassan, T. H. A., Abdulaziz, S. A., Mousa, A. B., Safiah, B. A., Maryam, M. A., Fahad, O. B. A., Mohammed, A. I. A. & Zainzb, M. A. A. (2019). Literature review on pathogenesis and treatment of depression. *Depression*, 9, 10.
- Abela, J. R., & D'Alessandro, D. U. (2002). Beck's cognitive theory of depression: A test of diathesis-stress and causal mediation components. *British Journal of Clinical Psychology*, 41(2), 111-128.
- Ahuvia, L., Jans, L., & Schleider, J. (2021). Secondary effects of body dissatisfaction interventions on depression: A meta analysis. *International journal of eating disorders*. <https://osf.io/734n8>.
- Alkattan, A., Alsalameen, E., & Ahmed, A. (2021). Central Nervous System Depressant Drugs: Updated Review. <https://doi.org/10.20944/preprints202101.0503.v1>.
- Allen, J. P. (2003). An overview of Beck's cognitive theory of depression in contemporary literature. Retrieved September 5, 2014.
- Alzoubi, A., Abunaser, R., Khassawneh, A., Alfaqih, M., Khassawneh, A., & Abdo, N. (2018). The bidirectional relationship between diabetes and depression: a literature review. *Korean journal of family medicine*, 39 (3), 137.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>.
- Annor, J. (2016). Alcohol use among senior high students in the GA central municipality [Masters Dissertation, University of Ghana] University of Ghana digital collections. <https://197.255.68.203/handle/123456789/21301>.

- Audrain-McGovern, J., & Benowitz, N. L. (2011). Cigarette smoking, nicotine and body weight. *Clinical pharmacology & Therapeutics*, 90(1), 164-168.
- Audrain-McGovern, J., Rodriguez, D., & Kassel, J. D. (2009). Adolescent smoking and depression: evidence for self-medication and peer smoking mediation. *Addiction*, 104(10), 1743-1756..
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck depression inventory (BDI-II) (13). Pearson.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories-IA and-II in psychiatric outpatients. *Journal of personality assessment*, 67(3), 588-597
- Bonora, B. (2020). Substance use and associated factor among high school and preparatory school students of Shakiso town. [Masters dissertation, Addis Ababa University] Addis Ababa University libraries.
<https://etd.aau.edu.et/handle/123456789/25703> .
- Boden, J. M., Fergusson, D. M., & Horwood, L. J. (2010). Cigarette smoking and depression: tests of causal linkages using a longitudinal birth cohort. *The British Journal of Psychiatry*, 196(6), 440-446.
- Briere, F. N., Rohde, P., Seeley, J. R., Klein, D., & Lewinsohn, P. M. (2014). Co-morbidity between major depression and alcohol use disorder from adolescence to adulthood. *Comprehensive psychiatry*, 55(3), 526-533.
- Busch, F. N. (2009). Anger and depression. *Advances in psychiatric treatment*, 15(4), 271-278.

- Carvalho, J. P., & Hopko, D. R. (2011). Behavioral theory of depression: Reinforcement as a mediating variable between avoidance and depression. *Journal of behavior therapy and experimental psychiatry*, 42(2), 154-162.
- Centers for disease control and prevention. (2020). Teen Substance Use and Risks. <https://www.cdc.gov/ncbddd/fasd/features/teen-substance-use.html>
- Coppen, A. J., & Doogan, D. P. (1988). Serotonin and its place in the pathogenesis of depression. *The journal of clinical psychiatry*.
- Curran, P. J., Stice, E., & Chassin, L. (1997). The relation between adolescent alcohol use and peer alcohol use: a longitudinal random coefficients model. *Journal of consulting and clinical psychology*, 65(1), 130.
- Cybulski, L., Ashcroft, D. M., Corr, M.J., Grag, S., Chew-Graham, C. A., Kapur, N., & Webb R. T. (2021). Risk factor for non fatal self-harm and suicide among adolescents: Two nested case- control studies conducted in UK clinical practice research.
- Cyranowski, J. M., Frank, E., Young, E., & Shear, M. K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: a theoretical model. *Archives of general psychiatry*, 57(1), 21-27.
- Dachew, B. A., Bifftu, B. B., & Tiruneh, B. T. (2015). Depression and associated factors among high school students in Northwest Ethiopia: *A cross-sectional study. International Journal of Mental Health Systems*, 9(1), 21. <https://doi.org/10.1186/s13033-015-0016-4>.
- Degenhardt, L., Hall, W., & Lynskey, M. (2003). Exploring the association between cannabis use and depression. *Addiction*, 98(11), 1493-1504.
- Flensburg-Madsen, T., Mortensen, E. L., Knob J., Becker, U., Sher, L., & Gronbaek,

- M. (2009). Co-morbidity and temporal ordering of alcohol use disorders and other psychiatric disorders: result from a Danish register based study. *Comprehensive psychiatry*, 50(4), 307-314.
- Fried, E.I., Bockting, C., Arjadi, R., Borsboom, D., Amshoff, M., Cramer, A.O., Epskamp, S., Tuerlinckx, F., Carr, D. and Stroebe, M., (2015). From loss to loneliness: The relationship between bereavement and depressive symptoms. *Journal of abnormal psychology*, 124(2), 256.
- Galaif, E. R., Sussman, S., Newcomb, M. D., & Locke, T. F. (2007). Suicidality, depression and alcohol use among adolescents: a review of empirical findings. *International Journal of adolescent medicine and health*, 19(1), 27-36.
- Gashaw, Y. (2015). Depression among Addis Ababa University sadist kilo campus: Prevalence, Gender difference and other associated factors [Masters Dissertation, Addis Ababa University] Addis Ababa university libraries.
<https://etd.aau.edu.et/handle/123456789/11506> .
- Gimeno, D., Kivimäki, M., Brunner, E. J., Elovainio, M., De Vogli, R., Steptoe, A., Kumari, M., Lowe, G.D., Rumley, A., Marmot, M.G. & Ferrie, J. E. (2009). Associations of C-reactive protein and interleukin-6 with cognitive symptoms of depression: 12-year follow-up of the Whitehall II study. *Psychological medicine*, 39(3), 413-423.
- Gobbi, G., Atkin, T., Zytynski, T., Wang, S., Askari, S., Boruff, J., Ware, M., Mayo, N. (2019). Association of cannabis use in adolescence and risk of depression, anxiety and Suicidality in young adulthood: a systematic review and meta analysis. *JAMA psychiatry*, 76(4), 426-434.

- Goodman, E., & Capitman, J. (2000). Depressive symptoms and cigarette smoking among teens. *Pediatrics*, 106(4), 748-755.
- Grant, B. F., Goldstein, R. B., Chou, S. P., Huang, B., Stinson, F. S., Dawson, D. A., Saha, T. D., Smith, S. M., Pulay, A. J., Pickering, R. P., Ruan, W. J., Compton, W. M. (2009). Sociodemographic and psychopathologic predictors of first incidence of DSM-IV substance use, mood and anxiety disorders: results from the wave 2 National Epidemiologic Survey on Alcohol and Related conditions. *Molecular psychiatry*, 14(11), 1051-1066.
- Haaga, D. A., Dyck, M. J., & Ernst, D. (1991). Empirical status of cognitive theory of depression. *Psychological bulletin*, 110(2), 215.
- Harlak, H., Eskin, M., Etekin, K., Dereboy, C. (2008). Prevalence of and factors related to depression in high school students. *Turkish journal of psychiatry* 19(4).
- Hides, L., Cotton, S.M., Berger, G., Gleeson, J., O'Donnell, C., Proffitt, T., McGorry, P.D. and Lubman, D.I., (2009). The reliability and validity of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in first-episode psychosis. *Addictive Behaviors*, 34(10), 821-825.
- Hodgson, K., Coleman, J. R. I., Hagenaaars, S. P., Purves, K. L., Glanville, K., Choi, S. W. O'Reilly, P., Breen, G., & Lewis, C. M. (2019). Cannabis use, depression and self harm: Phenotypic and genetic relationships. *bioRxiv*, 549899.
- Kandel, D. B., Raveis, V. H. & Davis, M. (1991). Suicidal ideation in adolescence: Depression, substance use, other risk factors. *Journal of Youth and Adolescence*, 20(2), 289-309.

- Kaplan, H. B., Martin, S. S. & Robbins, C. (1984). Pathways to adolescent drug use: Self-derogation, peer influence, weakening of social controls and substance use. *Journal of health and social behavior*, 270-289.
- Kebede, W. (2009). Psychoactive substance use related psychological problems at two selected governmental hospitals in Addis Ababa. [Masters dissertation, Addis Ababa University] Addis Ababa University libraries.
<https://etd.aau.edu.et/handle/123456789/7685>
- Khademalhosseini, Z., Ahmadi, J., & Khademalhosseini, M. (2015). Prevalence of smoking and It's relationship with depression and anxiety in a sample of Iranian high school students. *Enliven: pharmacovigil drug Saf*, 1(1), 005.
- Kilpatrick, D. G., Acierno, R., Saunders, B., Resnick, H. S., Best, C. L., & Schnurr, P. P. (2000). Risk factors for adolescent substance abuse and dependence: data from a national sample. *Journal of consulting and clinical psychology*, 68(1), 19.
- Kirby, T. & Barry, A. E. (2012). Alcohol as a gateway drug: A study of US 12th graders. *Journal of school health* 82(8), 371- 379.
- Kiyohara, C., & Yoshimasu, K. (2009). Molecular epidemiology of major depressive disorder. *Environmental health and preventive medicine*, 14(2), 71-87.
- Lees, B., Meredith, L. R., Kirkland, A. E., Bryant, B. E., & Squeglia, L. M. (2020). Effect of alcohol use on the adolescent brain and behavior. *Pharmacology, Biochemistry and Behavior*, 192, 172906.
- LeMoult, J., & Goltib, I. H. (2019). Depression: A cognitive perspective. *Clinical psychology review*, 69, 51-66.

- Lev-Ran, S., Roerecke, M., Le Foll, B., George, T. P., McKenzie, K., & Rehm, J. (2014). The association between cannabis use and depression: a Systematic review and meta-analysis of longitudinal studies. *Psychological medicine*, 44(4), 797-810.
- Lindsay, G. B. & Rainey, J. (1997). Psychosocial and pharmacologic explanation of nicotine's "gateway drug" function. *Journal of School Health*, 67(4), 123-126.
- Mallinckrodt, C. H., Goldstein, D. J., Detke, M. J., Lu, Y., Watkin, J. G., & Tran, P. V. (2003). Duloxetine: a new treatment for the emotional and physical symptoms of depression. *Primary care companion to the Journal of clinical psychiatry*, 5(1), 19.
- Matthews, C., & Easton, E. (2021). Causes of depression and the United States of America. *Sociology, psychology and religious studies* 3(3), 1-6.
- Mekonnen, J. & Abay, S. M. (2009). Kap survey on substance among university preparatory students in fogera district, North West Ethiopia. *Pharmacology line* (1), 144-152.
- Miller, W. R., & Seligman, M. E. (1975). Depression and learned helplessness in man. *Journal of abnormal psychology*, 84(3), 228.
- Ministry of Education (2020) Education statistics: Annual abstract September 2019-March 2020. www.moe.gov.et/EduStat.
- Morrell, H. E., & Cohen, L. M. (2006). Cigarette smoking, anxiety and depression. *Journal of Psychopathology and Behavioral Assessment*, 28(4), 281-295.
- Munafo, M. R., & Araya, R. (2010). Cigarette smoking and depression: a question of causation. *The British Journal of Psychiatry*, 196(6), 425-426
- Nichols, D. E., (2004). Hallucinogens. *Pharmacology & therapeutics*, 101(2), 131-181.

- Obadeji, A., Kumolalo, B. F., Oluwole, L. O., Ajiboye, A. S., Dada, M. U., & Ebeyi, R. C. (2020). Substance use among adolescent high school students in Nigeria and its relationship with psychosocial factors. *Journal of Research in Health Sciences*, 20(2), e00480.
- O'Malley, P. M., Johnston, L. D., & Bachman, J. G. (1998). Alcohol use among adolescents. *Alcohol health and research world*, 22(2), 85.
- Pacek, L. R., Martins, S.S., & Crum, R. M. (2013). The bidirectional relationships between alcohol and cannabis use disorders with major depressive disorder: results from a national sample. *Journal of affective disorders*, 148(3), 188-195.
- Pacheco- Colon, I., Ramirez , A. R., & Gonzalez, R. (2019). Effects of adolescent cannabis use on motivation and depression: a systematic review. *Current addiction reports*, 6(4), 532-546.
- Peacock, A., Leung, J., Larney, S., Colledge, S., Hickman, M., Rehm, J., & Degenhardt, L. (2018). Global statistics on alcohol, tobacco and illicit drug use: 2017 status report. *Addiction* 113(10), 1905- 1926.
- Petratis, J., Flay, B. R., & Miller, T. Q. (1995). Reviewing theories of adolescent substance use: Organizing pieces in the puzzle. *Psychological bulletin*, 117(1), 67.
- Ralph, E. (2004). Depression in children and adolescents: Information for parents and educators. National Association of School Psychologists: Social/ emotional development Nova South- Eastern University.
- Rassool, G. H., (2009). Alcohol and drug misuse: A hand book for students and health Professionals. Routledge

Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., Sempos, C. T.,

Frick, U., Jernigan, D. (2004). Alcohol use, 1 , 959-1109. <https://doi.org/10.15288/jsa.2004.65.782>

Robertson, B. M. (1979). The psychoanalytic theory of depression: Part I- The major contributors. *The Canadian Journal of Psychiatry*, 24(4), 341-352.

Schmitt, A. P. (2021). Resting state functional connectivity in adolescents experiencing sub clinical and clinical symptoms of depression: A mini review of recent evidence. <https://doi.org/10.1155/jn.00327.2021>.

Schuckit, M. A. (2009). Alcohol-use disorders. *The Lancet*, 373(9662), 492-501.

Seid, L., Gintamo, B., Mekuria, Z. N., Hassen, H. S., & Gizaw, Z. (2021). Substance use and associated factors among preparatory school students in Kolfe-Keraniyo sub city of Addis Ababa, Ethiopia. *Environmental health and preventive medicine*, 26(1), 1-12.

Seligman, M. E. (1972). Learned helplessness. *Annual review of medicine*, 23(1), 407-412.

Sharpley, C. F., & Bitsika, V., (2013). Differences in neurobiological pathways of four “clinical content” subtypes of depression. *Behavioral brain research*, 256, 368-376.

Singh, M. M., Gupta, M., & Grover, S. (2017). Prevalence and factors associated with depression among school going adolescents in Chandigarh, North India. *The Indian Journal of medical research*, 146(2), 205.

Steinberg, L. (2017). *Adolescence* (11th ed.). McGraw-Hill Education.

- Swendsen, J., & Merikangas, K. R. (2020). The comorbidity of depression and substance use disorders. *Clinical Psychology Review*, 31(6), 125–134.
<https://doi.org/10.1016/j.cpr.2020.03.001>.
- Tadesse, T., Zawdie, A., & Berhanu, B. (2020). Substance use and associated factors among high school adolescents in Ethiopia. *Journal of Adolescent Health Research*, 5(2), 55–62
- Tavares, B. F., Beria, J. U., & Lima, M. S. D. (2004). Factors associated with drug use among adolescent students in Southern Brazil. *Revista de saude publica*, 38, 787-796.
- Tiburcio Sainz, M., ROSETE-MOHEDANO, M. G., Natera Rey, G., Martinez Velez, N. A., Carreno Garcia, S., & Perez Cisneros, D. (2016). Validity and reliability of the Alcohol, Smoking, and Substance involvement Screening Test (ASSIST) in university students. *Adicciones*, 28(1).
- Vogel, J. S., Hurford, D. P., Smith, J. V. & Cole, A. (2003). The relationship between depression and smoking in adolescents. *Adolescence*, 38(149), 57.
- Weinberger, A. H., Kashan, R. S., Shpigel, D. M., Esan, H., Taha, F., Lee, C. J., Funk P. A. & Goodwin, R. D. (2017). Depression and cigarette smoking behavior: a critical review of population based studies. *The American Journal of drug and alcohol abuse*, 43(4), 416-431.
- World health organization. (2010). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Manual for use in primary care.
https://www.who.int/substance_abuse/activities/assist_v3_english.pdf.
- World health organization. (2017) Depression and other common mental health

disorders: Global estimates world health organization.

<https://apps.who.int/iris/handle/10665/254610> .

World health organization. (2021). Suicide worldwide in 2019: Global Health

Estimates. <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>.

World health organization. (2021).Alcohol, Drugs and Addictive Behaviors Unit.

https://www.who.int/health-topics/alcohol#tab=tab_1

Appendix

Section I: Demographic information

1. Age: _____ 2. Grade _____ 3. Gender: ☐ Male ☐ Female
4. Family income ☐ Low ☐ Medium ☐ High
5. Parental Education ☐ Illiterate ☐ Reading and writing ☐ High school diploma (G12)
☐ Bachelors degree ☐ Masters degree and above

Section II: The Beck Depression Inventory II (BDI-II)

BDI - II Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully. And then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

0. I do not feel sad. 1. I feel sad much of the time.
2. I am sad all the time 3. I am so sad or unhappy that I can't stand it.

2. Pessimism

0. I am not discouraged about my future. 1. I feel more discouraged about my future than I used to.
2. I do not expect things to work out for me. 3. I feel my future is hopeless and will only get worse.

3. Past Failure

0. I do not feel like a failure. 1. I have failed more than I should have.
2. As I look back, I see a lot of failures 3. I feel I am a total failure as a person.

4. Loss of Pleasure

0. I get as much pleasure as I ever did from the things I enjoy. 1. I don't enjoy things as much as I used to.
2. I get very little pleasure from the things I used to enjoy. 3. I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

0. I don't feel particularly guilty. 1. I feel guilty over many things I have done or should have done.
2. I feel quite guilty most of the time. 3. I feel guilty all of the time.

6. Punishment Feelings

0. I don't feel I am being punished. 1. I feel I may be punished 2. I expect to be punished.
3. I feel I am being punished.

7. Self-Dislike

0. I feel the same about myself as ever. 1. I have lost confidence in myself. 2. I am disappointed in myself.
3. I dislike myself.

8. Self-Criticalness

0. I don't criticize or blame myself more than usual. 1. I am more critical of myself than I used to be.
2. I criticize myself for all of my faults 3. I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

0. I don't have any thoughts of killing myself. 1. I have thoughts of killing myself, but I would not carry them out.
2. I would like to kill myself. 3. I would kill myself if I had the chance.

10. Crying

0. I don't cry anymore than I used to. 1. I cry more than I used to. 2. I cry over every little thing.
3. I feel like crying, but I can't.

11. Agitation

0. I am no more restless or wound up than usual. 1. I feel more restless or wound up than usual.
2. I am so restless or agitated; it's hard to stay still. 3. I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0. I have not lost interest in other people or activities. 1. I am less interested in other people or things than before
2. I have lost most of my interest in other people or things 3. It is hard to get interested in anything.

13. Indecisiveness

0. I make decisions about as well as ever. 1. I find it more difficult to make decisions than usual. 2. I have much greater difficulty in making decisions than I used to. 3. I have trouble making any decisions.

14. Worthlessness

0. I do not feel I am worthless 1. I don't consider myself as worthwhile and useful as I used to. 2. I feel more worthless as compared to others 3. I feel utterly worthless.

15. Loss of Energy

0. I have as much energy as ever. 1. I have less energy than I used to have. 2. I don't have enough energy to do very much. 3. I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

0. I have not experienced any change in my sleeping. 1a. I sleep somewhat more than usual. 1b. I sleep somewhat less than usual. 2a. I sleep a lot more than usual. 2b. I sleep a lot less than usual. 3a. I sleep most of the day. 3b. I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

0. I am not more irritable than usual. 1. I am more irritable than usual 2. I am much more irritable than usual. 3. I am irritable all the time.

18. Changes in Appetite

0. I have not experienced any change in my appetite. 1a. my appetite is somewhat less than usual 1b. my appetite is somewhat greater than usual. 2a. my appetite is much less than before. 2b. my appetite is much greater than usual. 3a. I have no appetite at all. 3b. I crave food all the time.

19. Concentration Difficulty

0. I can concentrate as well as ever. 1. I can't concentrate as well as usual. 2. It is hard to keep my mind on anything for very long. 3. I find I can't concentrate on anything.

20. Tiredness or Fatigue

0. I am no more tired or fatigued than usual. 1. I get more tired or fatigued more easily than usual.
2. I am too tired or fatigued to do a lot of the things I used to do.
3. I am too tired or fatigued to do most of the things I used to do.

Section III : Alcohol, Smoking and Substance Involvement Screening Test

INTRODUCTION:

The following are questions about your experience with alcohol, tobacco products and other drugs across your lifetime and in the past 3 months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in pill form.

1. In your life, which of the following substances have you <u>ever</u> used? (<i>non-medical use only</i>)		
	No	Yes
a. Tobacco products	0	3
b. Alcoholic beverages	0	3
c. Marijuana	0	3
d. Cocaine or Crack	0	3
e. Amphetamines or Stimulants	0	3

2. In the past three months, how often have you used the substances mentioned (<i>first drug, second drug, etc.</i>)	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products	0	2	3	4	6
b. Alcoholic beverages	0	2	3	4	6
c. Marijuana	0	2	3	4	6
d. Cocaine or Crack	0	2	3	4	6
e. Amphetamines or Stimulants	0	2	3	4	6

If never to all items in question 2, skip to question 6

If any substance in Question 2 was used in the previous 3 months continue with Questions 3, 4 & 5 for each substance used

3. During the <u>past three months</u> , how often have you had a strong desire or urge to use (<i>first drug, second drug, etc.</i>)?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products	0	3	4	5	6
b. Alcoholic beverages	0	3	4	5	6
c. Marijuana	0	3	4	5	6
d. Cocaine or Crack	0	3	4	5	6
e. Amphetamines or Stimulants	0	3	4	5	6

4. During the <u>past three months</u> , how often has your use of (<i>first drug, second drug, etc.</i>) led to health, social, legal or financial problems?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products	0	4	5	6	7
b. Alcoholic beverages	0	4	5	6	7
c. Marijuana	0	4	5	6	7
d. Cocaine or Crack	0	4	5	6	7
e. Amphetamines or Stimulants	0	4	5	6	7

5. During the <u>past three months</u> , how often have you failed to do what was normally expected of you because of your use of (<i>first drug, second drug, etc.</i>)?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products	0	5	6	7	8
b. Alcoholic beverages	0	5	6	7	8
c. Marijuana	0	5	6	7	8
d. Cocaine or Crack	0	5	6	7	8
e. Amphetamines or Stimulants	0	5	6	7	8

6. Has a friend or relative or anyone else <u>ever</u> expressed concern about your use of (<i>first drug, second drug, etc.</i>)?	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
a. Tobacco products	0	6	3
b. Alcoholic beverages	0	6	3
c. Marijuana	0	6	3
d. Cocaine or Crack	0	6	3
e. Amphetamines or Stimulants	0	6	3

7. Have you <u>ever</u> tried and failed to control, cut down or stop using (<i>first drug, second drug, etc.</i>)?	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
a. Tobacco products	0	6	3
b. Alcoholic beverages	0	6	3
c. Marijuana	0	6	3
d. Cocaine or Crack	0	6	3
e. Amphetamines or Stimulants	0	6	3