

**The Impact of Drug Related Consequences on Cooccurring Depression and  
Substance Use**

Noelle Jacqueline Frankovich

College of Social and Behavioral Sciences

Northwest University

**Author Note**

I have no conflicts of interest to disclose.

*Jennifer Harris, PhD, Dissertation Chair and Committee Member. Nikki Johnson, PsyD, Committee Member. Jeff Baird, PhD, Committee Member.*

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Correspondence concerning this article should be addressed to Noelle Frankovich at Northwest University, College of Social and Behavioral Sciences, 5520 108th Avenue NE, Kirkland, WA 98033. Email: [noelle.frankovich17@northwestu.edu](mailto:noelle.frankovich17@northwestu.edu).

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### **Dedication**

This dissertation is dedicated to my mom, dad, and Rev. Thank you for instilling the importance of education and supporting me along the way. It is also dedicated to and inspired by my dear friend Kasey Lee Crouse and brother Devin Andrew Krugman. Love and miss you two always.

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### **Abstract**

Adolescent drug use is a public health concern, as evidenced by the multitude of previous literature that has outlined the consequences for the users, their social system, and the community at large. Young drug users may suffer from strained interpersonal relationships, unfulfilled obligations at school, and severe mental health symptoms due to their use. The combination of depression, drug-related consequences, and quantity and frequency of use can be especially detrimental to an adolescent user. These three variables were examined through archival data from the school-based substance use intervention program Project Reducing the Effects of Alcohol and Drugs on Youth (READY). Project READY used motivational interviewing (MI) at high schools in the greater Seattle, Washington area to help students discontinue their use. Although these analyses yielded minimal significant results, depression, drug-related consequences, and quantity and frequency of use should still be a concern due to the long-term impact they have on an adolescent's life.

*Keywords:* adolescents, depression, substance use, quantity and frequency of use, motivational interviewing

## Chapter 1

According to the National Institute of Mental Health (NIMH, 2019) and the Substance Abuse and Mental Health Services Administration (SAMHSA, 2017), approximately 3.2 million youths residing in the United States, ages 12 to 17, have experienced a minimum of one major depressive episode (MDE) in their lifetime. This daunting number made up 13.3% of the adolescent population (NIMH, 2019; SAMHSA, 2017). An MDE, as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5), is an episode marked by changes in affect, indifference toward everyday activities, and disturbances in sleep, food intake, liveliness, attention, and self-esteem (American Psychological Association [APA], 2013). The NIMH (2019) and the SAMHSA (2017) discovered 2.3 million adolescents experienced an MDE with severe impairment to their daily functioning, which made up 9.4% of the adolescent population. Of the millions of adolescents who experienced an MDE, only 39.9% received treatment, which subsequently left 60.1% of adolescents with no treatment for their MDE (NIMH, 2019; SAMHSA, 2017). Numbers associated with adolescents experiencing an MDE and not receiving treatment are concerning. In addition, negative impacts associated with an MDE are devastating to young lives and must be viewed as a public health concern.

Regarding illicit substance abuse, SAMHSA authors Hedden et al. (2014) collected data from 2002 to 2014 and discovered 2.3 million individuals, ages 12 to 17, endorsed misusing illicit substances, which represented 9.4% of the United States adolescent population (Hedden et al., 2014). Degenhardt et al. (2004) defined illicit substances as the use of injectable opioids, meth/amphetamines, or cocaine. Regarding

alcohol misuse, SAMHSA authors, Hedden et al. (2014), discovered 8.7 million young people, ages 12 to 20, endorsed being a current user. A current user was defined as drinking alcohol within the last 30 days. Additionally, 5.3 million youths were considered binge alcohol users, and 1.3 million youths were considered heavy alcohol users. Each figure represented 22.8%, 13.8%, and 3.4% of the United States adolescent population, respectively (Hedden et al., 2014). Binge drinking, as defined by SAMHSA authors Lipari et al. (2017) during data collection for the National Survey on Drug Use and Health (NSDUH) 2010-2014 consensus, is consuming a minimum of five or more alcoholic beverages on one drinking occasion on a minimum of one day during the previous month (Lipari et al., 2017). Hedden et al. reported 1.3 million adolescents in the United States, ages 12 to 17, were considered to have a substance use disorder (SUD), which accounted for 5% of the population. Within the same sample, 679,000 adolescents were considered to have an alcohol use disorder (AUD), which accounted for 2.7% of the population (Hedden et al., 2014). The representation of adolescent illicit substance and alcohol use by SAMHSA and the numbers provided by NIMH for adolescent depression are alarming. Adolescents are suffering from depression and using substances, which could be a dangerous combination that can impact their lives in negative and irreparable ways.

A SAMHSA data report from 2004 to 2018 outlined MDE and substance abuse figures. It was noted that 14,295 adolescents, ages 12 to 17, received treatment for depression and a life impairing MDE within the last year (SAMHSA, 2019). Another graph from the same report outlined adolescents struggling with depression, an MDE, and substance use within the last year. This graph indicated adolescents with depression and a



history of MDEs were also abusing illicit substances, such as marijuana, cocaine, and alcohol (SAMHSA, 2019). These figures are a small representation of the U.S. adolescent population. In addition, specifics are not provided, such as depression preceding substance use or substance use preceding depression. Although, these statistics are an insightful resource in conveying the seriousness of adolescent cooccurring depression and substance use. The neurobehavioral disinhibition theory, Brown's (2004) adolescent model of addiction, cooccurring disorders, and Bandura's (1989) social learning theory provide more knowledge and drive home the message that adolescent depression and substance use is a public health concern.

### **Theoretical Orientation**

#### **Neurobehavioral Disinhibition Theory**

Neurobehavioral disinhibition (ND) is believed to be an insufficiency in the ability to regulate impulses, a marker in the onset of an SUD in adolescents (Tarter et al., 2003). Adolescents struggling with ND are worse off compared to their same-age peers. They often accept substances when offered, do not consider negative consequences when using, and find themselves in situations that perpetuate irresponsible behavior, such as in-house suspension (Dawe et al., 2004; Dishion et al., 1999; Goodnight et al., 2006; Kirisci et al., 2004; Rosenburg et al., 2001). Geographical area and neighborhood quality also impact ND. According to Ridenour et al. (2013), if an adolescent lives in a poor-quality neighborhood, they are significantly at risk for an SUD. On the other hand, if they live in a neighborhood separated by a river or a highway, they are less likely to experience high rates of SUDs. Where there are greater rates of ND, there are also a significant number of parents who are struggling with SUDs (Ridenour et al., 2013).

Due to an adolescent's underdeveloped brain connections, they are vulnerable to neurobiological threats (Luna et al., 2004). Underdeveloped connections, neurobiological threats, and their ever-changing brain leave them susceptible to negative behaviors. These negative behaviors include SUDs, tumultuous relationships with parents, and better relationships with other high-risk adolescents (Kelley et al., 2004; Steinberg et al., 2004). Schepis et al. (2008) discovered adolescents tend to participate in risk-taking behaviors and experience greater levels of stress compared to adults due to their neurobiology. Furthermore, once parental supervision decreases, relationships with high-risk peers increase, as does substance use. Equally important, the onset of experimentation poses a great threat, as once an adolescent initiates substance use, they have a higher chance of continuing to use (Schepis et al., 2008).

To predict an SUD in adolescence, Tarter et al. (2003) studied 10- to 12-year-old youths with ND. The authors were unable to predict an SUD at age 16, but participants struggled with an SUD at age 19. A child with ND does not guarantee an SUD, but it does put one at risk for developing an SUD later in life. Additionally, individuals with ND are also vulnerable to other psychiatric disorders (Tarter et al., 2003). The ND theory provided a neuropsychological perspective on adolescent substance use and Brown's adolescent model of addiction illustrates adolescent addiction through the model she created.

### **Adolescent Model of Addiction**

Brown's (2004) developmental model personally and developmentally conceptualizes the entire adolescent to help them discontinue substances. Because adolescents are extremely vulnerable to substance use, Brown's model considers the

unpredictable and ever-changing phases of their lives, and integrates appropriate interventions. Similarly, Brown noted ecological, social, and emotional fluctuations in adolescence should be considered when researching, assessing, or treating adolescents for SUDs. Taking adolescence into consideration is imperative due to the way substance abuse presents, the consequences that follow abuse, and the behavior modifications that can be integrated early. The model also integrates an adolescent's specific point in maturation. This portion of the model takes into consideration an adolescent's level of risk, strengths, and life situation. Younger adolescents who have not had as much time for their brain to mature are vulnerable in high-risk situations, such as instances where drugs are being used or offered. Additionally, they have not learned how to regulate their emotions and may become overly stressed or unable to control themselves in situations involving substances. Threats to abstinence, protective factors, and development of an adolescent's use must be taken into consideration. These may impact relapse or life changes after leaving substance abuse treatment (Brown, 2004).

Brown (2004) used Marlatt and Gordon's (1985) relapse prevention model as a staple in the research and treatment of adolescent addiction. Larimer et al. (1999) stated the model separates relapse into two classifications, immediate determinants, and covert antecedents. Immediate determinants included risky situations, coping skills, substance use expectancies, and the abstinence violation effect. Covert antecedents included specific life situations, impulses, and cravings to use. Furthermore, self-efficacy plays a central role in the model. Those who have the skills to handle a risky situation experience greater rates of self-efficacy and are better equipped to avoid relapse. In contrast, those who do not have the skills or greater rates of self-efficacy are more susceptible to relapse.

Moreover, those who fall victim to relapse will do so because of positive use expectancies, which will leave them with insecurity about their abilities to stay abstinent (Larimer et al., 1999). The combination of coping skills and higher rates of self-efficacy should be taught to adolescents who use substances and integrated into relapse prevention plans. These imperative skills and lessons could be the difference between recovery or relapse.

Using the stress vulnerability model of addiction and relapse, Anderson et al., (2006) further illustrated what is known about adolescent addiction when working with Brown. According to the model, an adolescent's psychological, social, and protective factors play a significant role in their substance use. Equally important, stressful life experiences, defined as emotionally taxing situations, 3 months after treatment, impacted their substance use. A 6-month follow-up after successful completion of treatment showed using the coping skills taught at the facility were helpful to abstain from drugs when temptation arose. The skills acquired in treatment also helped interpersonal issues. When used during times of temptation and interpersonal issues, the skills were a protective factor for participants. Although participants had extremely taxing life events and occurring disorders, the skills were especially helpful (Anderson et al., 2006). Using skills to resist temptation and solve interpersonal issues was helpful for participants after leaving treatment. Yet, for adolescents with extremely difficult life situations and cooccurring disorders, the skills gave them the tools they needed to stay abstinent from substances.

Anderson et al. (2011) shed light on the drive to abstain, the impulse to use, and alcohol expectancies in a sample of adolescents to predict their alcohol use when working

with Brown. The drive to abstain from using alcohol was not enough to prevent use compared to social pressures. Social pressures ultimately influenced the onset of using alcohol and being a recent user. However, these social pressures were not connected to being a problem user. Adolescents who were not socially driven did not have a difficult time abstaining from alcohol. The drive to abstain and use healthy coping skills was a protective factor against using alcohol. Regarding alcohol expectancies, positive use expectancies had a significant relationship with higher levels of alcohol consumption and alcohol-related consequences. On the other hand, protective factors against using alcohol included motivation to not use and negative alcohol use expectancies (Anderson et al., 2011). Socially driven youth are at higher risk regarding alcohol use. Expectancies may exacerbate the social motivation to use alcohol. Positive alcohol use expectancies and social motivation make an adolescent more inclined to drink alcohol for several reasons. However, an adolescent not socially motivated with negative use expectancies is less inclined to drink alcohol. It is recommended that a professional treating this population assess their client's social motivation and alcohol use expectancies.

### **Cooccurring Disorders**

Although a widely used definition for cooccurring disorders is still being debated among professionals, the Center for Substance Abuse Treatment (2005) conceptualized the term as an individual experiencing one or more psychiatric disorders and a substance use disorder. To meet the criteria for a cooccurring disorder, the diagnoses must exist separately from one another and cannot be within the same disorder (Center for Substance Abuse Treatment, 2005). Kessler et al. (1994) reported an SUD does not exist without another psychiatric disorder, as evidenced by the discovery of 53.9% of their

sample struggling with comorbidity. Interestingly, Kessler et al. (1994) stated cooccurring disorders are more common than they are not. Forty-eight percent of their sample endorsed experiencing one psychological disorder or SUD. Within that 48%, 79% struggled with two disorders, and 14% struggled with three disorders (Kessler et al., 1994).

Although Kessler et al. (1994) studied cooccurring disorders in adults, individuals typically start using substances during adolescence and continue through adulthood. Winokur et al. (1996) researched connections between age, bipolar disorder, and SUDs. When participants reported first experiencing fluctuations in mood due to their bipolar disorder, their age of first initiation of alcohol was early in adolescence (Winokur et al., 1996). In a similar study, Grant et al. (1996) found individuals with adolescent major depressive disorder (MDD) also had an SUD. In their sample, 7%–16% of individuals were diagnosed with MDD and an SUD. When looking at alcohol abuse, results were the same: The younger a participant was at the onset of their MDD, the more likely they were to abuse alcohol (Grant et al., 1996).

Examining residential substance abuse treatment data, Chan et al. (2008) discovered 78%–90% of adolescent participants had an internalizing or externalizing mental health disorder (Chan et al., 2008). Bird et al. (1993) defined internalizing mental health disorders as inwardly centered, such as anxiety, whereas externalizing disorders are outwardly centered, such as behavioral issues. Chan et al. reported 42%–61% of participants were diagnosed with an SUD, an internalizing disorder, and an externalizing disorder. Furthermore, when participants abused substances at higher rates, addiction and psychological symptoms increased in severity (Chan et al., 2008). Based on these studies,

cooccurring disorders are frequently diagnosed. Rarely do professionals diagnose one mental health disorder or SUD. Knowing this, substance abuse treatment interventions and professionals should account for cooccurring disorders. Lastly, the teachings of cooccurring disorder literature should be implemented to better serve adolescents in recovery.

### **Social Learning Theory**

Following the radical behaviorism era, Grusec (1992) stated social learning theory incorporated modeling, information-processing, and operant conditioning. After the developing ideas about teaching, social learning theory shifted and incorporated imitation as a form of learning. Imitation was a form of observational learning that can happen even if there is no reward for a behavior. For imitation to work, a model will or will not complete a behavior. The learner then watches and completes or does not complete the targeted behavior. Four key elements encompass observational learning: (a) attention, (b) memory, (c) accuracy, and (d) motivation. First, the learner must be attending to the stimulus. Next, the stimulus must be remembered. Third, the behavior that was imitated must be close to the initial behavior. Lastly, there must be motivation to complete the behavior (Grusec, 1992).

As Bandura (1989) developed social learning theory, cognition was added to it, which birthed social cognitive theory. This refined theory encompassed behaviors, thoughts, mood, attributes of the individual, and situational influences impacting an individual's decision-making abilities. Bandura believed people do not have an intentional or spontaneous internal drive. Moreover, Bandura felt people's decision-making abilities and completion of behaviors were not intentional or spontaneous either.

However, social cognitive theory was the factor influencing these variables. Interestingly, an individual's perceptions of their ability to handle difficult situations impact how much anxiety, depression, and internal drive they experience. Individuals who perceive themselves to be incapable of handling difficult situations experience greater rates of worry, stress, and rumination about poor coping skills, and believe their situation is hazardous (Bandura, 1989).

Social learning/cognitive theory relates to adolescent substance use through modeling and imitation. When adolescents have an individual in their social circle modeling substance use, they are more inclined to use (Ennett et al., 2008). Through modeling, the adolescent believes substances are acceptable because their peers or parents use (Bauman & Ennett, 1996; Petraitis et al., 1995; Richter & Richter, 2001). Ennett et al. (2018) studied the influence of social factors on an adolescent's alcohol use using Bandura's theory. The individual's family's, peers', and neighbors' alcohol use were all analyzed. The type and quality of the relationship influenced participants' alcohol use. Not surprisingly, participants abused alcohol at greater rates when they were trying to control their social situation, experiencing anxiety, and when peers were using alcohol. Even though direct relationships were integral in an adolescent's alcohol abuse, individuals within their broader social structure had an influence as well. Peers at school and same-age neighborhood peers were part of the influence on participants' alcohol use. This means an adolescent's specific situation can have a significant effect on their alcohol use (Ennett et al., 2008). Social learning theory coupled with adolescent substance abuse can foster a dangerous situation. If an adolescent observes their peers or parents using substances, they tend to use as well. Adolescents must be exposed to



appropriate role models to prevent them from thinking using substances is acceptable and typical behavior.

### **Exploring the Impact of Depression and Substance Use**

#### **Depression and Quantity and Frequency of Use**

Wu et al. (2008) analyzed data from two studies: the NIMH Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) and the Westchester Study (WS). Alcohol use, dependence, and cigarette smoking was measured within the last 6–12 months before participant interviews. Mental health diagnoses (e.g., major depression and dysthymia) were also assessed. Alcohol use, dependency, and smoking had a statistically significant relationship with depression. Depressed female participants were 4 times more likely to use and be dependent on alcohol. Depressed male participants were 12 times more likely to use and be dependent on alcohol (Wu et al., 2008). However, the impact of depression on quantity and frequency of use cannot be considered exclusive to alcohol and tobacco. This is evidenced by the following previous literature.

Poulin et al. (2005) found as their female participants increased their alcohol used, the severity of their symptoms of depression increased. Participants who used alcohol were 2 times more likely to experience depression. Furthermore, participants in lower grades were more likely to participate in binge drinking compared to participants in higher grades. Regarding tobacco and marijuana use, females were 2 times more likely to experience severe depressive symptoms when regularly using both drugs. Male participants who used marijuana were 1.5 times more likely to experience symptoms of depression (Poulin et al., 2005). Because differences among grade levels were found in

this study, prevention and intervention efforts should be varied. Professionals working with high school adolescents should take into consideration their grade level, which may help provide insight into their drug use patterns.

Way et al. (1994) discovered relationships between depression and substance use in suburban and inner-city high school students. Participants in the suburban high schools were more likely to use cigarettes, alcohol, and illicit substances compared to inner-city high school students. For marijuana, both groups of participants were likely to use the substance. Additionally, suburban high school students endorsing depression had higher rates of cigarette, marijuana, and illicit substance use. Qualitative results yielded similar findings to their quantitative figures. Higher levels of depression in the suburban high school students meant higher levels of cigarette, marijuana, and illicit substance use. Although substance use patterns varied between the schools, endorsement of depression was the same, both groups experienced persistent levels of depression regardless of the high school they attended (Way et al., 1994). High schools from dissimilar areas require different needs in terms of depression and substance use education. Every school can benefit from education on substance use and the consequences, but an emphasis must also be put on mental health due to the pervasiveness of disorder when using.

Curry et al. (2012) examined the probability of an adolescent's risk of being diagnosed with an AUD or SUD after treatment for depression. After treatment for MDD, 25% of the sample developed one of the use disorders. Age was a variable that impacted the outcomes. Older adolescents in treatment were more likely to develop an AUD. Moreover, participants who used over longer periods of time were more likely to develop a SUD (Curry et al., 2012). McCarty et al. (2012) discovered similar findings. The

younger an individual was when they initiated their use, the more likely they were to experience depression. Interestingly, depression was why an adolescent initiated use at an earlier age, which demonstrates a pervasive relationship between these two variables (McCarty et al., 2012). Curry et al. (2012) reported other mental health symptomatology and difficulties improving depressive symptoms during treatment were triggered by SUDs. In contrast, when participants were thriving in treatment for their depression, the less likely they were to suffer from a SUD. Regarding AUD, female participants were more likely to be diagnosed with the use disorder. Additionally, pervasive MDD made participants vulnerable to being diagnosed with AUD. Interestingly, the AUD transpired before the MDD. This reveals AUD increases an individual's chance of MDD persisting (Curry et al., 2012). Based on the previous literature, adolescents require different prevention and intervention efforts at specific ages. This could be due to differences in each developmental period an adolescent may experience. Younger adolescents may require age-appropriate prevention efforts. This would teach them proper coping skills and educate them on drug-related consequences in terms they can understand and apply. Teaching and educating younger adolescents will equip them with the confidence to abstain from substances. Older adolescents may require more advanced intervention efforts. This would provide them with the tools they need to better handle their emotions and stressful situations. In turn, the tools would prevent them from using substances to cope.

In a sample of young adults, Patton et al. (2002) found greater quantities of marijuana use increased symptoms of depression. Daily marijuana use made female participants 5 times more vulnerable to depression. Adolescent females were 4 times

more likely to be depressed when using marijuana daily and 2 times more likely when using marijuana weekly. Sixty percent of participants first used marijuana in high school. Due to using at a young age, 7% of the sample continued their use daily when transitioning into young adulthood. Daily use made adolescent female participants 5 times more vulnerable to depression. Furthermore, adolescent female participants were 2 times more vulnerable to depression when using marijuana weekly (Patton et al., 2002).

Over the course of four different developmental periods in adolescent participants' lives, Fleming et al. (2008) examined the impact alcohol, marijuana, and cigarettes had on depressive symptoms. Depending on the stage of development, alcohol, marijuana, and cigarettes impacted adolescents' depressive symptoms in distinctive ways. Notably, depression had a significant relationship with alcohol use. Interestingly, alcohol, marijuana, and cigarettes had a significant impact on depression in eighth graders. Female participant depression had a positive relationship with alcohol, marijuana, and cigarette use. Male participant depression only had a positive relationship with marijuana use. Lastly, if an adolescent rapidly increased using substances, their depressive symptoms followed and quickly increased in severity (Fleming et al., 2008). For some adolescents, patterns of early use can predict continued use at a later age. When depression is added into use patterns, the severity of their substance abuse and mental health symptoms are exacerbated.

Assari et al. (2018) studied African American teens and discovered variables contributing to the increase or decrease of their depression and use. Younger female participants whose families were living together, and who had tumultuous relationships with their mothers, experienced greater rates of depressive symptoms. In contrast, female

participants whose families were living together, and who had good relationships with their mothers, helped decrease marijuana use. Regarding peers, female participants were more likely to use marijuana if their peers were using. Similar results were found for male participants. A male participant's age had a significant relationship with the use of marijuana, although having a family that was living together and a good relationship with their mother reduced marijuana use. A peer's use of marijuana, however, significantly predicted a male participant's use. Contrary to previous literature, only male participants showed a significant relationship between marijuana use and depressive symptoms. Using marijuana predicted the severity of depression over time for male participants. Despite this, living in a consistent home and having good relationships with family members decrease drug use (Assari et al., 2018). Lastly, McLanahan et al. (2013) stressed the importance of a father's role in a family. An absent father may cause his children a plethora of issues. These issues include social-emotional difficulties, problems with substance abuse, and mental health symptoms into adulthood (McLanahan et al., 2013). A plethora of extraneous variables can intensify adolescents' depressive symptoms and substance use. Treatment and intervention efforts should leverage protective factors. It is important to include family members and people close to the adolescent in their substance abuse recovery. Healthy feelings of belonging may inspire and aid an adolescent in their recovery.

### **Depression and Substance Use Consequences**

Harris et al. (2017) reported binge drinking predicted negative outcomes. These negative outcomes included tolerance, withdrawal, the inability to regulate emotions and stop drinking, intense hangovers, sacrificing previously enjoyable hobbies, continuing to

use alcohol despite negative outcomes, using when it is unsafe, and legal issues. It was predicted that psychological dysregulation would explain the relationship between binge drinking and negative outcomes. Psychological dysregulation included heightened emotions, mood, inability to pay attention or control oneself, excitability, hostility, poor planning, and cognitive rigidity. Findings indicated binge drinking did predict negative outcomes. Furthermore, negative outcomes increased as participants increased their alcohol use binge drinking. Additionally, psychological dysregulation played a role in both binge drinking and negative outcomes. This finding explained that as participant alcohol use increased, so did the negative outcomes they experienced due to their mood, actions, or poorly regulated cognitions while drinking (Harris et al., 2017). Psychological dysregulation is one of many consequences that may follow when using substances. Another consequence is age of first initiation. Age of first initiation is the first time an individual experiments with drugs; however, experimentation can lead to a lifetime of dependence and other consequences, such as severe mental health symptoms.

Conducted from September 2010 to March 2012, Henchoz et al. (2016) assessed data from the Cohort Study in Substance Use Risk Factors (C-SURF). Participants reported their mental health symptomatology, levels of depression, and lifetime substance use. Lifetime substance use included marijuana, hallucinogens, meth/amphetamines, psychostimulants, opiates/opioids, and synthetic substances. Although the sample was young men and not adolescents, the younger they reported using marijuana for the first time, the more likely they were to use alcohol, nicotine, and other substances. Additionally, participants who reported using high levels of marijuana were 2 years younger compared to those who reported not using as much marijuana at their age of first

consumption. The age of first marijuana consumption had a significant relationship with depression. This finding revealed the young men who first used marijuana at 13 to 15 years old struggled with MDD (Henchoz et al., 2016). The younger an individual's age of onset for marijuana use, coupled with using marijuana in high amounts, resulted in abuse of other substances or poor mental health. The use of other substances and mental health issues are another two drug-related consequences among a plethora of other drug use consequences. Previous literature shows the list on drug-related consequences continues and where the list stops has yet to be discovered.

Wright et al. (2016) discovered depression was not the only consequence an adolescent can experience when using marijuana. Disinhibition, joy, and scores from the Behavioral Inhibition System and Behavior Approach System (BIS/BAS) may also be impacted. Two measures assessed participants' level of interaction with stimuli that was enjoyable or not. Higher scores on the BAS and lower scores on the BIS indicated participants' inability to control impulses. Lower scores on the BAS indicated low affect or inability to respond to positive stimuli. Marijuana was found to significantly impact participants' depressive symptoms. Furthermore, females showed more disinhibition. Participants were asked to refrain from using marijuana for 1 week. After 1 week of abstinence, participants suffered from increased symptoms of depression, were not interested in having fun, and scored lower on the BAS. Marijuana impacted participants' depression, mood, and responses to stimuli even after discontinuing the substance for 1 week (Wright et al., 2016). Substance use can impact symptoms of depression in distinctive ways. These distinctive ways persist differently for people, but there is no avoiding experiencing drug-related consequences.

K. M. Green and Stewart (2014) researched differences in depression and drug-related consequences in men and women. There were differences found between the two genders and the way mental health disorders persisted; however, both genders still experienced depressive symptoms and drug-related consequences. For both genders, a diagnosis of early adulthood MDD made them vulnerable to developing more than one SUD in later adulthood. Female participants abused alcohol, and men participants abused other substances. Female participants were also at increased risk for smoking due to depression and drug-related consequences (K. M. Green & Stewart, 2014). Mental health and drug-related consequences work in a circular pattern. This makes the relationship between mental health and substance use complex. Depressive symptoms impact quantity and frequency of use as quantity and frequency of use impacts depressive. Drug-related consequences also impact quantity and frequency of use and depressive symptoms. As drug-related consequences increase, so does use and depression, which then increases the consequences and more depression. The circular relationship between depression, drug-related consequences, and use continues.

### **Substance Use Consequences and Quantity and Frequency of Use**

Wicki et al. (2018) explained the relationship between alcohol-related consequences and adolescents' willingness to repeat those consequences to continue to drink. They predicted participants' risky single occasion drinking (RSOD) would be related to negative consequences. Within the last month, participants experienced two RSODs and, as a result, had hangovers and did or said things that made them feel humiliated. Participants endorsed being willing to experience a future hangover to continue to drink. Additionally, as participants continued to drink, they continued to



experience negative consequences. This showed an association with the willingness to experience future negative consequences. Lastly, female participants endorsed experiencing memory issues, and male participants endorsed experiencing sexual encounters during these drinking occasions (Wicki et al., 2018). Despite negative drug-related consequences, adolescents were still willing to experience the outcomes associated with drinking to continue to use. Drugs can have an undeniable hold on adolescents and the people who use them. Oftentimes, this is unbeknownst to the people in their lives and sometimes themselves.

Stein et al. (1993) discovered adolescent drug use impacted job activities, job satisfaction, and firing rate in young adulthood. They examined the relationship between adolescent drug use and their job patterns once they reached young adulthood. From 1971 to 1973, participants were in adolescence. From 1980 to 1981, participants were young adults. Results indicated adolescent drug use impacted job activities, job satisfaction, and firing rate in young adulthood. Those who endorsed using drugs frequently in adolescence continued to use drugs young adulthood. Furthermore, negative job outcomes were perpetuated by heavy drug use in young adulthood. This meant, due to their heavy drug use, participants continued to experience a loss of job activities, job satisfaction, and the ability to stay employed (Stein et al., 1993). Stein's findings are similar to the drug-related consequences in the DSM. An individual is fully involved in their SUD if they continue to use despite fulfilling their school, interpersonal, or work responsibilities.

Adolescents who use alcohol suffer academically and participate in delinquent behavior. D'Amico et al. (2016) discovered, as their sample used more alcohol, the less

prepared they were academically and the higher they scored on a delinquency measure. Participants performed poorly on their academic work due to being underprepared, endorsed participating in delinquent behavior, and suffered from mental health symptoms because of their marijuana use (D'Amico et al., 2016). Hangovers, embarrassing moments, memory loss, sexual experiences, work-related issues, and suffering academically are a few of the consequences in a list of many. Adolescents who use alcohol may also be putting themselves in physical danger when using. Thoma et al. (2010) reported those who drank alcohol and suffered from a head injury because of drinking reported they experienced other alcohol-related consequences. A clinically relevant head injury; an inability to control impulses; low social responsibility; and negative physical, interpersonal, and intrapersonal outcomes were all endorsed by the sample because of their drinking (Thoma et al., 2010). Continued use despite exacerbating a physical or mental health problem is another criterion in the DSM for an SUD. Adolescents are willing to suffer the consequences to continue to use despite the deterioration of their personal life, physical well-being, and mental health. Professionals working with this population should educate adolescents on the positive experiences that can result when in recovery. It is important to establish with the adolescent personal motivators so they can stay abstinent, discontinue use, and no longer experience negative consequences.

Bonomo et al. (2001) had their adolescent participants report the amount of alcohol they used within the last year and the consequences that followed. Alcohol use precipitated two significant consequences: 17% were accidents and injuries, and 15% were risky sexual experiences. Participants who drank in high amounts and often

participated in antisocial antics (e.g., property damage, stealing) were two times more likely to get physically hurt. The chances of physical harm increased to 3 times more likely when drinking with others. Regarding sexual risk-taking and drinking, those with a predisposing mental health issue were 2–4 times more likely to participate in feeling guilty about having sex or having sex without protection (Bonomo et al., 2001). Through a school intervention program, Estoup et al. (2016) examined consequences of marijuana use before and after legalization in a sample of Washington state adolescents. Participants found marijuana use to be riskier after the drug was legalized. This subsequently made them 3.73 times more vulnerable to negative outcomes when using marijuana. Even though the sample perceived using marijuana to be riskier after it had been legalized, they showed increased awareness into the severity of their use. Those in the program before legalization did not decrease their use and continued to experience negative outcomes (Estoup et al., 2016). Despite the perception that using drugs is risky, adolescents continue to use in great amounts. Typical drug use education may not work on every adolescent. It is important for a professional to discover creative ways to motivate adolescents to discontinue their use. Additionally, abstinence may prove to be more difficult than predicted, depending on the severity of use. This must also be worked into a treatment and relapse prevention plan.

Farrell et al. (1993) explained how friends and emotional control interacted with adolescent alcohol, cigarette, and marijuana use. The Weinberger Adjustment Inventory (WAI) examined how participants adapted during a specific period of maturity. The Emotional Restraint Scale (ERS) assessed accountability, aggression control, urge control, and thoughtfulness toward others. The measures were reviewed the previous

month, and several discoveries were examined. These discoveries included peer drug use, how often drugs were offered by peers, how often participants felt pressured to use because of peers, and how often participants used on their own accord. Male participants scored lower on emotion control, higher on giving in to peer pressure, and higher on using drugs. Depending on the specific period of maturity and drug their peers were using, pressure to use increased for male and female participants. Emotion control and peer use increased participant drug use and frequency of use (Farrell et al., 1993). Friends are an important part of an adolescent's life. They often act as chosen family members, are a great source of support, and offer fun memories. On the other hand, they can have a negative influence on vulnerable adolescents. Friends can act as a drug-related consequence and lead vulnerable adolescents down a deeper path of drug use. This deeper path includes poor emotional control as well as using in higher amounts and more frequently. It is important to note the peers who may negatively impact an adolescent and peers who may positively impact an adolescent. Both relationships breed vastly different outcomes.

Conway et al. (2013) examined polysubstance use in a group of 10th graders. Prescription medication was discovered as the main substance they abused. Notably, prescription medication abuse is particularly dangerous due to dependence and accidental overdose. Polysubstance abusing participants disclosed drinking in amounts comparable to or greater than alcohol users. The sample reported experiencing consequences, such as severe depression and physical ailments. Physical ailments included head, stomach, and back pain (Conway et al., 2013). Like Conway, Jenkinson et al. (2014) studied polysubstance users and tracked the consequences they experienced. Alcohol appeared to

be the substance used in with other substances the individuals were using. Ecstasy and methamphetamine were used among half of participants. These drugs can be poisonous, cause dehydration, and result in accidental overdose. To ease the comedown from ecstasy or methamphetamine, participants used alcohol or marijuana. Another important discovery was that participants spent most of their money on substances. This greatly impacted their finances and made them concerned for their future finances (Jenkinson et al., 2014). When individuals abuse multiple drugs, the consequences can cause irreparable damage. Oftentimes the consequence from polysubstance use is their life.

In a school-based study that used motivational interviewing to decrease adolescent drug use, Stewart et al. (2016) found the intervention was successful at preventing negative drug-related consequences. Participants who did not have to wait to participate in the intervention, Project Reducing the Effects of Alcohol and Drugs on Youth (READY), reduced their substance use and negative consequences before the program started. Those in the waitlist control group showed some reductions in use and negative consequences before the start of the program but not as significantly as the Project READY participants. Once participants started Project READY, waitlist control group participants showed the same number of reductions met by the original Project READY participants in alcohol use and negative consequences (Stewart et al., 2016). Project READY was a success, and it is important for adolescents to participate when spots are available; however, an interesting note was that being enrolled in an intervention for substance abuse helped reduce use and negative consequences. As evidenced by this study, adolescents should know they are enrolled in a program because it may help kickstart the road to recovery.

**Depression, Substance Use, and Related Consequences**

The interaction of depression, drug-related consequences, and quantity and frequency of use is a dangerous combination for adolescent users. Each of these variables have their own specific costs, but when interacting together, each consequence is exacerbated. After examining ecstasy and meth/amphetamine use in a group of 10th graders, Brière et al. (2012) discovered depressive symptoms were reported after 1 year. Participants who reported using these substances were 1.7 and 1.6 times more likely to have depressive symptoms due to ecstasy and meth/amphetamine use respectively. Using both drugs in large quantities and often greatly impacted participants' depressive symptoms. Depressive symptoms were negatively affected whether they were taken together or not (Brière et al., 2012). Johnson and Kaplan (1990) followed their adolescent sample into young adulthood and measured substance use as a maladaptive coping mechanism for mental health symptoms. When the adolescents grew into young adulthood, using drugs as a maladaptive coping skill perpetuated their mental health symptoms for 17 years. Equally important, using drugs frequently in an adolescence exacerbated their mental health symptoms. This triggered the cyclical interplay of drug use and mental health. When participants were in young adulthood and suffering from severe mental health symptoms, they were less motivated to pursue higher education and steady employment, or build an excess of future resources. This lack of motivation and resources was caused by frequent drug use, which again triggered the perpetuating cycle associated with drug use and mental health symptoms (Johnson & Kaplan, 1990). The deeper an individual is entrenched in their depressive symptoms, drug-related consequences, and quantity and frequency of use, the harder it is to start the process of

recovery. Prevention and early intervention efforts are key for substance using adolescents; however, once they enter young adulthood or older adulthood, efforts must be adapted accordingly. Different periods of life require different treatment and relapse prevention plans. Each stage of maturity brings certain stressors and relational, school, or work changes. All factors must be considered when providing treatment to individuals of different ages.

Synthetic substances result in similar psychological issues, dependence, and consequences other drugs do. Angulski and Gerber (2020) examined “spice,” which is a synthetic cannabinoid. Past users were interviewed about their experiences with the drug. Most participants began using spice because the high was like marijuana. They also liked spice because it could not be detected on a drug test. However, the negative psychological consequences that resulted because of spice were significant. A male participant reported he felt he was experiencing a psychotic break while high on spice. Other participants reported experiencing debilitating depression, anxiety, panic attacks, suicidal ideation, and suicide attempts while using spice. Regarding quantity and frequency of use, a participant reported getting high once and not stopping their use until 3 years later. This extensive spice abuse led to spending hundreds of dollars on the drug, getting into car crashes, losing college opportunities, developing tolerance to the drug, and experiencing severe withdrawal symptoms (Angulski & Gerber, 2020). Even though a substance has yet to be classified as a schedule one drug, the consequences are the same: difficult to endure and life changing in negative and unprecedented ways.

In another high school-based study, Stewart et al. (2015) examined depressive symptoms, drug-related consequences, and quantity and frequency of use in a sample of

Project READY participants. Mood dysregulation differed depending on the presentation of participants' depressive symptoms. Additionally, the context in which they were using alcohol (e.g., drinking to cope with negative mood) was also found to impact their mood. Moreover, females endorsed higher levels of depressive symptoms. The number of drinks consumed by participants within the previous 30 days positively correlated with AUD criteria and typical blood alcohol content (tBAC). Using drinking to cope had a positive relationship between tBAC, depressive symptoms, and mood dysregulation. Those who endorsed higher rates of depressive symptoms used alcohol as a coping mechanism at greater rates. Higher rates of depressive symptoms and using alcohol as a coping mechanism predicted tBAC scores and meeting AUD criteria in the sample. Those who suffered from clinical depression used alcohol to manage difficult moods and interpersonal issues, which resulted in a positive relationship with greater tBAC levels and DSM-5 AUD symptoms. Notably, those who endorsed depressive symptoms did not drink frequently but instead drank in greater amounts and within a shorter period. Lastly, mood dysregulation was not the sole reason participants drank, and it was not the only experience that perpetuated AUD symptomology. However, it made the sample vulnerable to drinking in higher amounts and to experiencing AUD symptoms (Stewart et al., 2015). Depression, drug-related consequences, and quantity and frequency may not be the only predictors of negative outcomes; however, they do make individuals vulnerable to the possibility of experiencing negative outcomes, especially when all variables work in tandem together.

King et al. (2006) examined drug use in a sample of adolescents and followed them when they transitioned into college. They were interested in assessing the samples'



ability to complete their degrees. A significant relationship existed between drug use in adolescence, attending college classes, and degree completion was found. Results were not linear, and class attendance or degree completion did not suffer due to a participant using drugs. However, participants who used drugs in adolescence and continued into college were dysregulated psychologically. This psychological dysregulation, fueled by drug use, was a significant reason why a participant did not finish their degree.

Internalizing behaviors (e.g., loneliness, sadness, anxiousness) and externalizing behaviors (e.g., stealing, hurting others, damaging others' property) played key roles in participants' inability to complete their degree as well (King et al., 2006). Drug use starting in adolescence can spur psychological dysregulation when in college. This creates devastating consequences for those pursuing a higher level of education. Without a higher level of education, drug use and psychological dysregulation can become exacerbated. Prevention and intervention efforts must be started early to avoid future undue harm.

## Chapter 2

The nature of this study is archival. Data were collected from the substance use intervention program Project READY. Project READY is provided to students enrolled in high school throughout the greater Seattle area. This program used motivational interviewing (MI) as a therapeutic tool to help students change drug use habits. Participants' demographic information, and scores from the CDDR, ADUCQ, and CES-D, were used. Collected data were deidentified and analyzed using SPSS.

### Operational Definitions

Adolescents included individuals ages 13 to 19 years old during the administration of the measures and intervention. Participants who were assessed endorsed depressive symptoms, using drugs, and experiencing drug-related consequences. According to the DSM-5, substances included alcohol, marijuana, hallucinogens, inhalants, opioids, stimulants, psychostimulants, prescription medications, synthetic drugs, and tobacco products. Substance use was reported to be any drug that could be taken in large amounts, induce stimulation of the brain's reward pathways, and induce inebriation. Additionally, substance use causes withdrawal, tolerance, and exacerbates mental health disorders, such as depression or anxiety (APA, 2013). Using Radloff's (1977) definition, depression included low affect and feeling remorseful, worthless, powerless, or hopeless. Furthermore, depression may cause psychomotor delays, atypical variations in eating habits, or sleep (Radloff, 1977). Depression may cause consequences, such as a loss of interest in once pleasurable things or negative feelings, but the combination of depression and drug-related consequences make for a dangerous situation for adolescent users.

Drug-related consequences, a definition taken from the DSM-5, was defined as substances that could be consumed in excessive quantities or for over a longer period than predicted. Furthermore, drug-related consequences included a desire to control use but being unable to and an excessive amount of time acquiring, consuming, and healing from effects of drugs. They were also defined as having an undeniable desire to use drugs, continuing to use despite physical dangers, and unfulfilled work, school, home, or relational responsibilities. Additionally, consequences may present as tolerance, withdrawal, and continuing to use despite physical or mental health issues. Tolerance occurs when an individual needs to take greater amounts of the drug to achieve a similar high or state of inebriation as when they first used the drug. Withdrawal is discontinuing or limiting the use substances after building a tolerance. Withdrawal can induce perspiration, increase heart rate, cause shaking hands, sleep issues, purging, deliriums, psychomotor issues, nervousness, and grand mal seizures. Due to the unpleasant nature, individuals will continue to use the drug, drugs that are similar, or drugs that mimic the effects of the drug of choice to help with or prevent withdrawal (APA, 2013). Drug-related consequences are pervasive and impact an adolescent's quality of life in a plethora of ways. These ways include negative impacts on their physical and mental health or interpersonal relationships. Drug-related consequences may also become exacerbated by the quantity and frequency at which an adolescent uses drugs.

Quantity and frequency of use was taken from Brown et al. (1998), who had their adolescent participants report the entirety of their drug use. For alcohol, the quantity and frequency for beer, wine, and hard liquor was measured. Furthermore, how many times in total they have drank, how many days spent drinking within the last 3 months, the age of

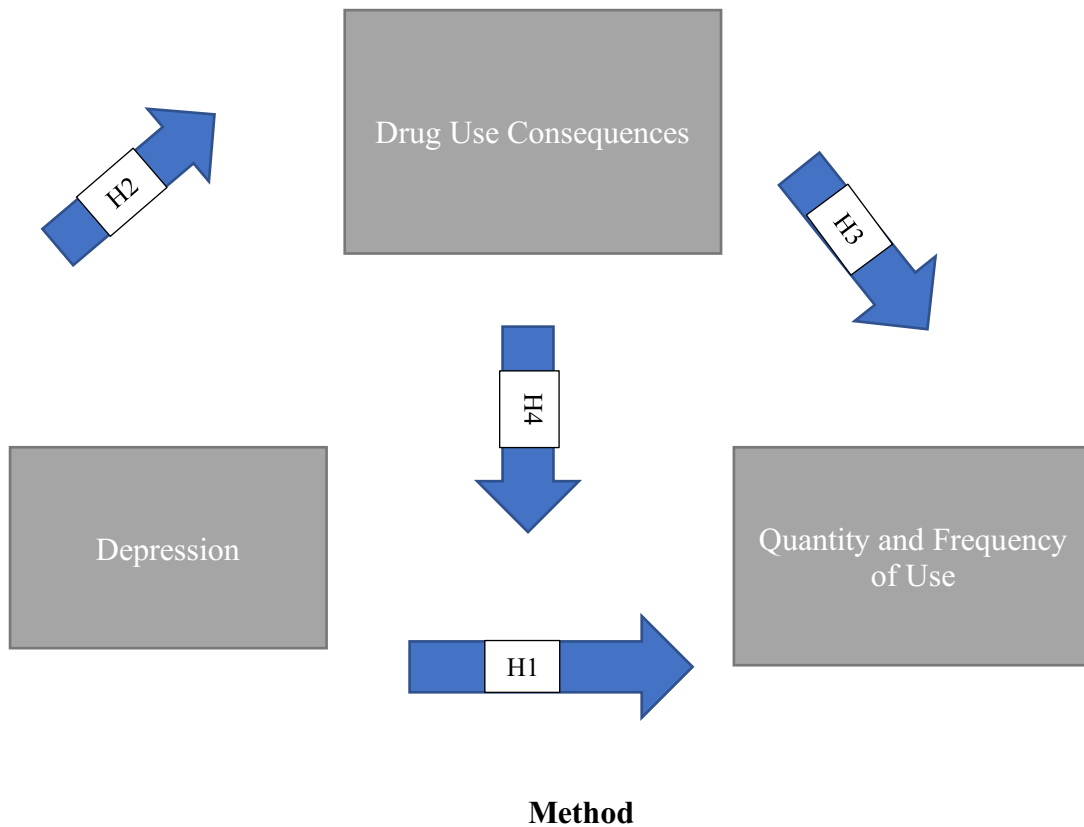
first initiation, the age they started drinking habitually, and how many times they drank to inebriation were asked of participants. For quantity, participants were asked how many drinks they have used in a day, the date and amount of the most recent alcohol drinking episode, and the most alcohol they have used during one drinking episode. The same questions were asked for drugs. Drugs included marijuana, amphetamines, barbiturates, hallucinogens, psychostimulants, inhalants, opiates, and prescription medications (Brown et al., 1998). These definitions are insights into depression, drug-related consequences, and quantity and frequency of use.

### **Hypotheses**

Based on the literature review and theoretical orientations, this study included the following hypotheses: the first hypothesis is that symptoms of depression will positively predict quantity and frequency of drug use in adolescents, in that the higher an individual's depression score, the higher their quantity and frequency of use will be. Hypothesis 2 is that symptoms of depression will positively predict drug use consequences in adolescents. Hypothesis 3 is that higher drug use consequences will positively predict the severity of quantity and frequency use. Finally, drug use consequences will moderate the relationship between symptoms of depression and quantity and frequency of use. A representation of the hypotheses is shown in Figure 1.

**Figure 1**

*Representation of Hypotheses Based on Theoretical Orientations and Literature Review*



### **Participants**

With an anticipated effect size of .15 (moderate), power set at .95, alpha at .05, one predictor in Set A (Depression), and two predictors in Set B (Depression and Consequences) a sample size of 107 is required according to the power analysis. Students were recruited from Seattle, WA high schools for the school-based drug and alcohol program Project READY. Recruitment fliers for Project READY were sent to students, parents, and teachers. Participants were self-referred or referred by their parents, peers, or school administrators. Consent for treatment, assent for research, and parental consent were obtained prior to the onset of treatment and data collection. Participants volunteered

their information during the first session and were provided confidential numbers to protect their identity. This study did not use deception. Inclusion criteria included adolescents ages 13 to 19 years old and those who have used in the last three months. Exclusion criteria included individuals who have never used drugs or alcohol. The average age was 15.94 ( $SD = 1.32$ ) with a range from 14 to 19 years old. Twenty-five percent of the sample identified as female and 75% identified as male ( $SD = .44$ ). Regarding class rank, 27.8% of the sample were freshman, 29.2% were sophomores, 19.4% were juniors, and 23.6% were seniors. Students identified racially as White (58.3%), Black (15.3%), Latinx (13.9%), Asian/Pacific Islander (4.2%), other (2.8%), and biracial (5.6%).

## **Instruments**

### ***Depression***

The Center for Epidemiological Studies Depression Scale (CES-D Scale; Radloff, 1977) is a 20-item self-report measure that assesses for specific characteristics of depressive symptoms. These characteristics included depressed affect, psychomotor delays, and changes in sleep or eating habits. Additionally, feelings of guilt, worthlessness, helplessness, and hopelessness were analyzed. The internal consistency for the CES-D was high, approximately .85 in a general sample and .90 in the participant sample. Since the CES-D is a measure that captures weekly depressive symptoms, test-retest reliability was variable. When test-retest was completed in a shorter timeframe, the scores were higher. When it was completed in a longer timeframe, scores were lower. The CES-D was based off participants' depressive symptoms, which resulted in validity being. The measure distinguished between the general population and those who

participated in the initial study. It was also able to show differences in depressive symptoms before and after the administration of interventions for depression. The CES-D was sensitive to the varying degrees of depressive symptoms and can be used with other depression inventories. Example questions from the CES-D are as follows, “I was bothered by things that usually don’t bother me” and “I had trouble keeping my mind on what I was doing.” When answering the provided questions, an individual can choose “Rarely or none of the time (less than 1 day),” “Some or a little of the time (1–2 days),” “Occasionally or a moderate amount of time (3–4 days),” or “Most or all of the time (5–7 days)” to conceptualize their weekly depressive symptoms (Radloff, 1977).

### *Substance Use*

The Customary Drinking and Drug Use Record (CDDR; Brown et al., 1998) is a form with 101 questions that assess use from the previous 3 months. The CDDR assesses for how much and how often an individual uses drugs, their psychological and behavioral dependence, and withdrawal or other negative use experiences. When measuring reliability and validity, a sample of adolescents participating in substance abuse treatment and a sample from the community who used drugs were compared. Internal consistency for alcohol and drug psychological/behavioral dependence was .89 and .72 for the treatment sample. For the community using sample, internal consistency was .78 and .85. Regarding alcohol and drug use withdrawal, internal consistency was .90 and .94 for the treatment sample. For the community using sample, internal consistency was .80 and .90. Negative outcomes were assessed using alcohol and the treatment sample, which was .68. After 4 years, internal reliability was established at .63 to .90 for alcohol, drug psychological/behavioral dependence, and withdrawal in the treatment sample. Test-

retest reliability was .83 for alcohol, .92 for drugs, .87 for alcohol dependence, .76 for drug dependence, .70 for alcohol withdrawal, and .85 for drug withdrawal. Interrater reliability was strong at 99% (Brown et al., 1998).

Brown et al. (1998) used a 1-year follow-up, the Alcohol Dependence Scale (ADS), and the Structured Clinical Interview (SCI) were used to establish convergent validity. Convergent validity for the 1-year follow-up was  $r = .68, p < .001$  and  $r = .74, p < .001$ . The ADS and treatment sample was  $r = .56, p < .001$ . Convergent validity for alcohol dependence and withdrawal on the CDDR was  $r = .57, p < .001$ . For the ADS and dependence scores in the community using sample the figures were  $r = .57, p < .001$  and withdrawal was  $r = .24, p < .001$ . The CDDR had a positive relationship with life issues ( $r = .54, p < .001$ ), negative drug use outcomes ( $r = .40, p < .001$ ), and negative alcohol use outcomes ( $r = .40, p < .001$ ) on the SCI. To assess for discriminant validity, the two samples were compared. The treatment sample used substances to a greater degree compared to the community using sample ( $p < .01$  to  $p < .001$ ). After age of first initiation was determined for both samples, discriminant validity was found to be 98% and 97%. To determine criterion validity, the Diagnostic Schedule for Children (DISC) was used. Alcohol dependence was 92% ( $k = .84$ ), marijuana dependence was 80% ( $k = .51$ ), and miscellaneous drug dependence was 83% ( $k = .66$ ). Sample questions from the CDDR are as follows, "How old were you when you started drinking alcohol regularly/at least once per week?" and "Over the last 3 months, in the average 24-hour period you were using marijuana, how much marijuana did you use? (Example: Number of joints)." Participants were asked to write their respective answers to the questions provided (Brown et al., 1998).



### *Consequences*

The Alcohol and Drug Use Consequences Questionnaire (ADUCQ; Brown et al., 1998; White & Labouvie, 1989) is an adaptation of the Rutgers Alcohol Problems Index (RAPI) and the diagnostic criteria for substance use disorders outlined in the DSM-5. It is a 51-item measure with a Likert scale ranging from 1 to 4. The measure included a category for alcohol and other drugs, which participants are to answer “(0) Never,” “(1) 1 or 2 times,” “(2) 3 to 5 times,” “(3) 6 to 10 times,” and “(4) More than 10.” Participants are asked to indicate which drug they mentioned the most. Internal consistency was found to be high ( $\alpha = .97$ ). Sample items from the ADUCQ are as follows, “Have you missed out on activities because you spent too much money on drugs or alcohol?” and “Have you experienced any withdrawal symptoms when you stop or cut down on your use of alcohol or drugs (e.g., headaches, nausea, vomiting, shaking)?” (Brown et al., 1998; White & Labouvie, 1989).

### **Procedure**

For this study, participants were referred to the school-based substance use program Project READY. During Session 1, they were given informed consent, assent, and parental consent forms. Demographic information, such as age, gender, ethnicity, and class standing were collected during the initial interview. Interventionists were trained in MI and engaged in approximately 15 minutes of the therapeutic tool before moving into assessments to establish rapport. Participants were administered the CDDR as an interview. Participants were then given two versions of the ADUCQ (one for alcohol and one for the drug of their choice) as a self-report inventory. Although the CES-D can be administered as a self-report, the measure was administered in an interview format to

assess for suicidal ideation. Participants who had CES-D scores over 16 (reverse-coded items 4, 8, 12, and 16) were given a suicide risk assessment and provided with resources in the community. If a student endorsed suicidal ideation, school administrators, and parents were informed of risk. During Session 2, participants received personalized feedback on their use, consequences, and depression scores.

### **Analysis**

This study used a hierarchical linear regression. A hierarchical linear regression is a variation of a multiple linear regression. This was used to analyze the archival data collected from Project READY. According to S. B. Green and Salkind (2004), a multiple linear regression analysis includes data from multiple independent variables and one dependent variable. This is done to account for certain variables. Data are then formulated into equations that convey how the independent variables impacted the dependent variable (S. B. Green & Salkind, 2004).

### Chapter 3

#### Results

The impact of depression and drug-related consequences on substance use was examined. Alcohol and marijuana were the two drugs studied due to a lack of data on the other drugs that were assessed for in Project READY. Descriptive statistics for the variables are presented in Table 1.

**Table 1**

*Means and Standard Deviations*

Variables	Mean	Standard Deviation
Alcohol Frequency	4.13	12.82
Alcohol Quantity	2.95	6.82
Marijuana Frequency	23.46	26.85
Alcohol Consequences	.35	.52
Drug Consequences	.85	.75
Depressive symptoms	17.11	13.01

**Table 2**

*Bivariate Correlations Between Variables*

Variables	Consequences	Depression
Alcohol quantity	.07	.10
Alcohol frequency	.42*	.21*
Consequences	---	.34*

*Note.* \* $p < .05$

**Table 3**

*Bivariate Correlations Between Variables*

Variables	Consequences	Depression
Marijuana	.48*	.11
Consequences	---	.51*

*Note.* \* $p < .05$

A multiple regression analysis was conducted to predict quantity and frequency of drug use from depression and related consequences. The data showed depression did not predict alcohol frequency,  $R^2 = .05$ ,  $F(1, 60) = 2.89$ ,  $p = .09$  but alcohol-related consequences did predict alcohol frequency  $R^2 = .14$ ,  $F(1, 59) = 9.70$ ,  $p = .003$ . Depression did not predict alcohol quantity,  $R^2 = .01$ ,  $F(1, 60) = .59$ ,  $p = .45$  nor did alcohol-related consequences predict alcohol quantity,  $R^2 = .00$ ,  $F(1, 59) = .09$ ,  $p = .76$ . Depression did not significantly predict  $R^2 = .01$ ,  $F(1, 62) = .44$ ,  $p = .51$  marijuana frequency, but marijuana-related consequences did predict marijuana frequency  $R^2 = .16$ ,  $F(1, 62) = 11.36$ ,  $p = .001$ .

## **Chapter 4**

### **Discussion**

The first hypothesis that depression will positively predict quantity and frequency of drug use was partially supported. It was expected that the higher a participant's depression score, the higher their quantity and frequency of drug use would be. Depression did not predict alcohol frequency, alcohol quantity, or marijuana frequency. Although, depression was significantly correlated with alcohol frequency. The positive correlation likely means the regression was not significant due to the low sample size. For participants, depression was associated with how often they drank but not how much they drank or how often they used marijuana. The lack of prediction for alcohol frequency, alcohol quantity, and marijuana frequency were inconsistent with previous research (Wu et al., 2008; Patton et al., 2002; Poulin et al., 2005). However, the correlation between depression and alcohol frequency was supported by previous research (Curry et al., 2012; Fleming et al., 2008). Alcohol use predicted depression and those who drank were two times more likely to experience depression compared to those who did not (Poulin et al., 2005; Wu et al., 2008). Furthermore, alcohol use precipitated MDD. This revealed participants' use triggered their mental health symptoms (Curry et al., 2012). Additionally, the more an individual used alcohol or marijuana, the more likely they were to experience depressive symptoms (Fleming et al., 2008; Patton et al., 2002). For this sample, depression did not predict alcohol frequency (days spent drinking), alcohol quantity (how much they drank on one occasion), or marijuana frequency (days spent using marijuana). On average, the sample endorsed being depressed and those who were depressed reported drinking more frequently. The sample

size did not meet the criteria for the power analysis and may have contributed to the nonsignificant results. Specifically, the positive correlation between depressive symptoms and alcohol frequency may have resulted in a significant prediction had the sample size been greater. This should be explored in future research.

The second hypothesis that symptoms of depression will positively predict drug use consequences was partially supported. Participants' depression scores were significantly correlated to both alcohol- and marijuana-related consequences. This was consistent with previous research (K. M. Green & Stewart, 2014; Harris et al., 2017; Henchoz et al., 2016; Wright et al., 2016). Binge drinking was discovered to negatively impact psychological functioning, such as emotions, behavior, and cognitions (Harris et al., 2017). Furthermore, using marijuana at an earlier age spurred the use of other drugs and more severe symptoms of depression (Henchoz et al., 2016). Additionally, depression, the ability to positively respond to presented stimuli, and control over impulses was a consequence of marijuana use (Wright et al., 2016). Lastly, depression made a participant vulnerable to multiple substance use disorders. This led to the continued experience of drug-related consequences and a repeated pattern of the three variables, depressive symptoms, drug use consequences, and quantity and frequency of use (K. M. Green & Stewart, 2014). This sample identified that they were experiencing depression and drug-related consequences, but they were unable to associate the two variables. Future research should investigate whether the relationship between depressive symptoms and substance-related consequences is a bidirectional prediction or whether consequences is a better predictor of depressive symptoms.

Hypothesis 3 that higher rates of drug use consequences will positively predict the severity of quantity and frequency use was partially supported. Alcohol-related consequences predicted alcohol frequency and marijuana-related consequences predicted marijuana frequency. Although, alcohol-related consequences did not predict alcohol quantity, how much a participant drank on one occasion. The lack of prediction drug-related consequences had on alcohol quantity was not consistent with previous research (Bonomo et al., 2001; D'Amico et al., 2016; Thoma et al., 2010; Wicki et al., 2018). On the other hand, drug-related consequences predicting alcohol and marijuana frequency was consistent with previous literature (Conway et al., 2013; Estoup et al., 2016; Farrell et al., 1993; Jenkinson et al., 2014; Stein et al., 1993). Those who used at a younger age continued to use into adulthood. This pervasive use led to job dissatisfaction, which perpetuated heavier drug use (Stein et al., 1993). Adolescents perceived marijuana use to be risky but continued to use despite the risk and negative consequences they were endorsing (Estoup et al., 2016). Higher rates of drug use in male adolescents led to giving in to peer pressure and the inability to control their emotions (Farrell et al., 1993).

Polysubstance users experienced a greater number of consequences compared to alcohol users. These consequences included financial strain, higher levels of dependence, physical injuries, dehydration, drug poisoning, and accidental overdose (Conway et al., 2013; Jenkinson et al., 2014). Adolescents were willing to experience hangovers and doing or saying embarrassing things to continue to drink. Additionally, female participants were more likely to experience memory issues. On the other hand, male participants were more likely to experience sexual encounters (Wicki et al., 2018). Lastly, adolescents who drank were underprepared for school, participated more in delinquent

behavior, had poor impulse control, were less socially accountable, experienced negative interpersonal and intrapersonal outcomes, participated in property destruction, stole, physically hurt themselves, and took sexual risks (Bonomo et al., 2001; D'Amico et al., 2016; Thoma et al., 2010). Regarding this sample, drug use consequences was not associated with alcohol quantity but was associated with alcohol and marijuana frequency. Participants were able to make the connection between their drug-related consequences and the number of times they drank or used marijuana, but they did not see the relationship between drug-related consequences and the amount of alcohol they were using on one occasion. The drug-related consequences measure used in the study, the ADUCQ, is a frequency measure but not a quantity measure. This could be a reason why drug-related consequences were supported for frequency but not quantity.

The last hypothesis that drug use consequences will moderate the relationship between symptoms of depression and quantity and frequency of use was the second step added to each regression. This hypothesis was not supported because hypothesis one was not significant. Symptoms of depression did not predict alcohol frequency, alcohol quantity, or marijuana frequency. Because depression did not positively predict quantity or frequency of drug use, the strength or direction of each relationship was unable to be determined. Although depression was significantly correlated with alcohol frequency, which could have been due to the low sample size. Drug-related consequences not impacting the relationship between symptoms of depression and quantity and frequency of use was not consistent with previous literature (Angulski & Gerber, 2020; Brière et al., 2012; Johnson & Kaplan, 1990). Depression was found to be a consequence and perpetuated using drugs in larger quantities and frequently. This extensive and pervasive



drug use intensified symptoms (Brière et al., 2012). Those who used drugs in adolescence experienced mental health symptoms for 17 years, did not continue their education or have steady employment, and had minimal resources for their future. The combination of these variables created severe depressive symptoms (Johnson & Kaplan, 1990). Spice users experienced significant consequences. The consequences included the inability to stop using, suicidal ideations and suicide attempts, drug dependence, financial strain, car crashes, educational consequences, tolerance, withdrawal, and severe mental health symptoms (Angulski & Gerber, 2020). Regarding this sample, examining the strength or direction of the relationship between symptoms of depression and quantity and frequency of use was unable to be determined due to the lack of prediction in hypothesis one.

### **Strengths, Limitations, and Future Directions**

There were several strengths associated with this study. Insight into depression, drug use consequences, and quantity and frequency of use was gathered from the data despite the lack of prediction. The sample was endorsing each of these variables, which leaves a lingering relationship had power been reached. Furthermore, despite the low sample size, significant correlations were found. Bootstrapping was performed, and significant results were produced with the larger simulated sample size. Additionally, grade levels for the sample were balanced. The grade-level representation provided insight into how adolescents in different grades may be experiencing depressive symptoms, drug-related consequence, and quantity and frequency of use. The racial demographics in this study did not appear to be representative of broader society. Due to this, it is not recommended that these results be applied to different races. Although, patterns of use can still be drawn from what was discovered. The information from the

results could be used as a resource to aid in the competent treatment of substance use disorders across different races. Lastly, interviewers were trained in motivational interviewing, and participants were asked open-ended questions. Motivational interviewing is a technique often used in the treatment of substance use disorders. The use of open-ended questions elicits robust and complete answers from participants as opposed to close-ended questions that do not elicit comparable answers.

There were also several limitations associated with this study. Participants were depressed, experiencing drug-related consequences, and using drugs but not reaching power greatly impacted the data. Over 100 participants' data were initially collected from Project READY. Although, after clearing incomplete and nonapplicable data, only 62 participants' information could be analyzed. This left a small sample size for the study. Due to the small sample size, application to the general adolescent population is not recommended. Male identifying participants outnumbered female identifying participants. This means results cannot be applied to female identifying adolescents. Although there was an imbalanced representation of genders, insight into male identifying clients and their patterns of substance use can be drawn. Unfortunately, incomplete and nonapplicable data resulted in alcohol and marijuana as the only drugs appropriate for examination. Data were collected on other drugs but not enough to be used in the analyses. This means results of this study can only be applied to alcohol and marijuana. Although, because power was not reached, it is recommended to use these results as a steppingstone to further other inquires on the same topic and not be used to draw general conclusions about alcohol and marijuana. The independent variable was skewed. This resulted in depression having a greater mean than the dependent variables,

drug use consequences and quantity and frequency of use. Although, assumptions of normality were not violated because the dependent variables were normally distributed. Furthermore, the data relied on self-reports. This leaves the possibility of underreporting of depressive symptoms, drug-related consequences, and quantity and frequency of use. Lastly, participants not relating their depression, drug-related consequences, and quantity and frequency of use was an unforeseen variable. Participants were able to identify their symptoms, reported drug-related consequences, and endorsed using, but they did not notice a relationship between all three.

Should this research be replicated, power must be reached, and the data must be complete. Not reaching power greatly impacted this study and for a future study to yield significant results, there must be enough and applicable data. Data were collected throughout high schools in the greater Seattle area and students miss school or session for a variety of reasons. To expand this research, ensure complete data, and enough participants, it could be collected in a residential or inpatient setting. Although no participant should be forced to partake in an intervention for research, adolescents are more inclined to do so when in a residential or inpatient setting. Adolescents in treatment tend to participate for a variety of reasons. Some participate because they are invested in recovery and others participate to leave treatment as soon as possible. This study used archival data and residential or inpatient substance abuse treatment data may already exist. In this case, new data would not have to be collected. Many treatment facilities have a plethora of recorded data that have yet to be used. The data must be complete for all drugs. Alcohol and marijuana were the only substances studied due to missing or a lack of data for the other substances. Lastly, no identifying information was recorded on

the measures and confidentiality was respected. In the future, to help mitigate underreporting, participants could complete the measures separately without the interviewers watching and the information discussed when finished. Individuals tend to alter their behavior when they are being watched. Participants could have felt their information was being shared with the school or their parents based on the referral process.

### **Conclusions and Applications for Counseling Psychologists**

Specific differences between participants were revealed in this study. These differences should be taken into consideration when providing treatment for this population. Age of first initiation, grade level, gender, family circumstances, peer use, and polysubstance use can all play a role in an adolescent's substance use. An individual's age of first initiation, the first time they tried substances, can impact their lives in a plethora of different ways. The younger an individual uses, the more vulnerable they are to mental health issues, polysubstance use, and using over longer periods of time (Henchoz et al., 2016; McCarty et al., 2012; Wicki et al., 2018). Differences in use was shown among grade levels, younger grades tend to use in higher amounts compared to those in higher grades (Brière et al., 2012; Fleming et al., 2008). Additionally, college is a time of freedom and experimentation. This can be detrimental to some when substances are involved. Although college is a higher level of education, it is also a significant transitional time. A young adult may be more inclined to use substances to cope with this significant transition and take advantage of their newfound freedom. Being in a younger grade and recently starting high school is a transition like college. Using substances can help ease the experience for some if they are having a difficult time coping. Social

motivation can play a role in an adolescent's use. If an adolescent is socially motivated, they may be inclined to use with their peers. They may use so their peers are perceiving them in a certain light or so they feel a sense of belonging (Anderson et al., 2011).

Gender played a significant role in mental health symptomology. The variations included severity of symptoms, specific vulnerabilities to certain mental health disorders, and specific drug-related consequences (i.e., unwanted sexual experiences for females, physical harm for males; Curry et al., 2012; K. M. Green & Stewart, 2014; Wicki et al., 2018).

Family circumstances, such as motherless or fatherless households can impact an adolescent in negative ways, which may lead an adolescent to use drugs (Assari et al., 2018; McLanahan et al., 2013). Growing up in a single parent household may leave an adolescent with an empty feeling and substances fill that void. Furthermore, a toxic or chaotic home life is detrimental to an adolescent. Drugs are a reprieve from the turmoil there are experiencing and a way to avoid emotional pain. Having parents or family members that use drugs model substances as an acceptable and appropriate coping mechanism. Additionally, peer use mirrors family dynamics. If an adolescent's friends are using, they are more inclined to use (Assari et al., 2018). Peers are also modeling that substances are acceptable, a coping mechanism, or a way to fit in better and belong with the group. Lastly, dangerous physical and severe mental health symptoms are consequences of polysubstance use. These consequences include accidental overdose, physical harm (i.e., traumatic brain injuries), and exacerbated mental health symptoms (Conway et al., 2013; Jenkinson et al., 2014). Counseling psychologists working with this population must note that most substance users are polysubstance users. A counseling

psychologist treating this population should consider MI or other behavioral interventions to implement in therapy. It is imperative to not neglect the interplay of cooccurring disorders and to treat an individual's substance use first, so they prepared to participate in therapy. Each of these variables are important implications for future treatment and therapy. They all play a key role in an adolescent's drug use, which is why depression, drug use consequences, and quantity and frequency of use must be treated as a public health concern.

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