

# **Does adolescent substance-use affect academic performance?**

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## Introduction

### Problem Statement

According to the National Survey on Drug Use and Health (NSDUH), in 2020, 7.3 million adolescents aged 12-17 reported using alcohol in the past year, and 3.8 million reported using illicit drugs. The Monitoring the Future survey, which tracks drug use among high school students, found that in 2021, 39% of 12th graders reported using an illicit drug at least once in their lifetime, and 18% reported using a prescription drug without a prescription. The same survey found that 30% of 12th graders reported binge drinking (consuming five or more drinks in a row) in the past two weeks (National Survey on Drug Use and Health, 4/19/23).

According to the Britannic (2023), adolescence is defined as the growth and development between childhood and adulthood. During this stage, puberty will start to occur. Physical changes concluding in reproductive maturity, along with emotional changes. According to Anahad O'Connor's article, teenage brains maybe especially vulnerable to marijuana and other drugs, adolescents and teenagers who experiment with marijuana and prescription drugs are more likely to get hooked on them than young people who try these drugs for the first time when they are college-aged or older, according to a new analysis of federal data. The research suggests that young people may be particularly vulnerable to the intoxicating effects of certain drugs, and that early exposure might prime their brains to desire them (O'Connor, 2021).

The use of drugs and alcohol has devastating effects on its users. As the legalization of marijuana has increased in several states, it is more accessible to teens. If the research shows a direct relationship between teens' substance use and academic performance, what effects does

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this have on their future? What is the long-term health, behavior, and social development risk factors?

### **Significance of Research**

Alcohol and drug abuse have negative effects on both the user and society at large, including risks to the user's health, an increase in pregnancies at an early age, car accidents, financial costs, and lost productivity (Gutiérrez & Sher, 2015). Sheehan et al. (1988) found that over 90% of adult addicts began substance use in adolescence. Substance abuse in adolescence can be associated with psychosocial or mental health problems in adolescence and in adult life (Robins et al., 1986; Hansel and White, 1991). Adolescence is the origin of adult addictions (Swadi,1999). According to A multi-method exploratory study of stress, coping, and substance use among high school youth in private schools, over two-thirds of student transcripts described substance use as both endemic to their social experience and as a method of managing stress, indicating that substance use for stress relief emerged as a dominant coping strategy identified by students (Leonard et al., 2015). Most research studies show the negative effects of drug use among adolescents. Further research is still needed to show if there is a relationship between drug use and academic performance.

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### **Literature Review**

#### **Substance Use among Adolescents**

As stated by the National Center for Drug Abuse Statistics, teens in the state of New York are 25% less likely than other teens to have misused drugs in the last year, they are still 3.78% more likely to have consumed alcohol than other teens. These numbers are accounted for teens ages 12-17 years old. Teens in New York City use drugs at a rate of 8.31%, drink alcohol at a rate of 9.50%, and use alcohol at a rate that is 3.78% higher than that of the average American in their age group (Bustamante, 2023). As stated by Partnership Attitude Track study, completed in 2007, 65% of adolescents use substances to help them feel better. 65% of adolescents use substances to look cool. 55% of adolescents use substances to deal with family issues. And 54% of adolescents use substances to improve in sports. Along with the list of reasons teens use substances. According to an article published by NIH, it was reported that in 2022, 12% of eighth graders, 20.5% of 10th graders, and 27.3% of 12th graders reported vaping nicotine. Also stated in the article, alcohol use amongst 12th graders was 51.9% in 2022.

#### **Potential Causes of Substance Use among Adolescents**

There are many reasons adolescents choose to engage in substance use; peer pressure, physical or sexual abuse, social media influence, family dynamics and mental health issues being a few of the underlying causes of drug use. These reasons include experimenting with drugs, peer pressure, or emotional distress. Many adolescents report stress as a major reason for their drug use. The pressures of family issues along with social and educational demands

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may cause teens to feel overwhelmed. The euphoric impact of the substance may give a temporary escape from everyday pressures. As teens are developing their own identity, friends, and the need to fit in play a crucial part. Many teens are influenced to try different substances to fit in a particular group. Family substance use history may affect teen drug use. Teens who were raised in homes where their family members used drugs may have normalized drug use for them. They believe the risks of using substances are not as harmful when compared to adults. Teens with depression and other mental health disorders may use substances to cope with anxiety or to lift their depressive mood (Maggs et al., 2023).

### **Consequences of Adolescent Substance Use**

Risky behavior, dating violence, developmental problems and homelessness are some consequences of adolescent substance use. When drugs are added to the system, the dopamine surge sends the user into a euphoric overdrive, which is especially concerning for adolescents because the brain develops up until the age of 25, so frequent drug use during these formative years can have serious long-lasting effects (DeKin, 2018c). According to a CASA study, teens aged 15 and older who had used other drugs were five times more likely to have engaged in sexual activity than those who hadn't, and they were also three times more likely to have done so with four or more partners (DeKin, 2018c). Because of the long-lasting effects that substance use has on brain development and physiological function, it is easy to correlate poor academic performance and drug use.

### **Academic Performance**

There are a few reasons why drug abuse can influence academic performance; it can decrease brain function, which, in turn, can influence the student's ability to complete

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schoolwork. There are studies that have been conducted that prove that heavy substance abuse can cause problems in working memory and brain activity; this can cause adolescents to suffer academically. A study conducted on PubMed compared the neuropsychological functions of alcohol and non-alcohol dependent adolescents between the ages of 15 and 16 years old. Throughout this study, the subjects underwent different neurological and physiological tests. The results from these tests showed significant differences; long-lasting alcohol use showed less verbal and nonverbal retention of intact learning. They also showed poor visuospatial functioning and poorer retention of verbal and non-verbal information. Testing showed a lack in normal brain function regarding remembering and retaining information. In summary, prolonged substance use has damaging effects on brain function, which in turn can affect academic performance (PubMed2000).

The Surgeon General's Report on Alcohol, Drugs, and Health, as mentioned in the article, Facing Addiction in America, showed abnormalities in brain structure and functions due to heavy marijuana and alcohol abuse. The study tested the correlation of brain activity, structure, and function and the prolonged use of illicit substances and found that marijuana and alcohol use increased from 8% to 22% at the time the study was conducted in grades eight through twelve (Levy et al., 2017).

Another study grouped together data from 7,874 students, with the dependent variable being alcohol and drug use, and studied the effects it had on individual grade point averages; age, socioeconomic status and mental health problems were also considered during this study. It was determined that grade point averages were significantly lower for students who continuously used illicit substances. Particularly, boys reported significantly lower averages than girls, with boys scoring 13% lower on physiological and academic testing than girls.

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### Potential Interventions for Adolescents' Substance Use

Research intervention methods and preventive strategies have been shown to have a positive impact on the behavior and choices made. These strategies are evidence-based programs designed meticulously and proven effective over time. Although the programs work in diverse populations and in numerous situations, the impact of the programs can only be effective depending upon the commitment of the communities. It's probable that evidence-based programs along with the dedication of the communities can be effective and bring positive change. However, there are circumstances where evidence-based programs may not be an option. These consist of training, cost, and the readiness and fidelity of society. Some resources are created locally; guides to help parents, educators, and community leaders, develop strategies when the established evidence-based programs aren't available.

Preventive measures and intervention methods can include population-based strategies and interventions, activities in school, the community, family, and on the individual level. Effective Prevention Strategies for adolescents and drug prevention will focus on increasing academic and social proficiency by teaching various skills (HE; Substance abuse in children: Prediction, protection, and prevention). School-based substance abuse interventions consist of substance abuse counseling and classroom-based activities designed for prevention, education, and treatment by focusing on environment, community, and developmental factors.

Parent-based interventions for preventing or reducing adolescent substance use- A systematic literature review. "For this randomized study, 653 adolescents were screened, and 39 publications dealing with 13 programs were included. Results reveal desirable effects of

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parenting measures such as rule-setting, monitoring, and parent- child communication” (RC; The effectiveness of family interventions in preventing adolescent illicit drug use: A systematic review and meta-analysis of randomized controlled trials). Results showed some evidence of curbing, preventing, and reduction in adolescent substance use. The outcome depends on the adolescent’s age group, the parents involved, and the intensity of the program.

### **The effects of adolescent substance use.**

Teens who use substances may have a lower tolerance for the drug due to their smaller body size and lack of experience, which may result in substance abuse leading to higher mortality rates among youth. What may start as an experience with a drug may turn into dependence. Long-term marijuana use may result in respiratory illnesses (Manchikanti, 2007b). Additionally, according to the National Center for Drug Abuse Statistics (NCDAS), substance use may lower inhibitions and result in negative decisions, such as driving while intoxicated or drinking, teens may make poor judgments about sex and safety, and teens may act violently and harm themselves or others while under the influence. The early gateway drugs, such as marijuana, tobacco, and alcohol, may cause lifelong deviance (Manchikanti, 2007).

The NCDAS classifies alcohol, marijuana, opioids, and stimulants as drugs. Opioids are morphine, heroin, codeine, oxycodone, and fentanyl; they are typically prescribed by doctors for extreme pain. Opioids may act as a sedative, offering a calming euphoric effect to those who consume them. Stimulants speed up how quickly the body's nervous system functions. Examples of stimulants include cocaine, caffeine, nicotine, a (Manchikanti, 2007b)

Substance abuse has been one of the most long-lasting social issues; it has had major effects on both individuals and the family dynamic as well and the communities. The number of

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persons who have some type of substance abuse increases every day; this is often the root of crime, the spread of disease and even the increase of mental health diagnoses and suicide rates. The use of illicit substances can severely impair a person's life, especially if drug use begins at the age of adolescence. It can alter behavior and impair their ability to make good decisions. Introducing the use of illicit drugs while their brains are developing can be detrimental; it can delay brain development and cause developmental and intellectual disabilities (Manchikanti, 2007b).

### **Purpose of Research**

This research will focus on substance use amongst high school students, and how it affects people. Their academic performance is those in grades 9-12 who are using or have used illegal and legal substances. This study looks at the association between high school students' substance use and its impact on their academic performance. The following research question will be answered: How Does Substance Use Affect Academic Performance in High School Students? Does it affect them negatively the more they use it? Surveys, interviews, as well as mixed-method strategies will be used to gather the information to conduct this study. Further research is needed for a deeper understanding of the impact substance use has on high school student's academic performance, to move forward in creating solutions to the problems. Interventions, and prevention services are needed.

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### Part 2 Research Proposal

#### Data collection

Our research team decided that in order to get the most substantial evidence, it would be ideal to collect data from students in every grade, ranging from ninth through twelfth. We chose 100 students from two high schools: 50 being from Bellport Highschool, the next 50 being from Pat Med Highschool. Ultimately, we used students from each grade ranging from 9<sup>th</sup> through 12<sup>th</sup> grade. Being as these students are minors, we made sure to get consent from both the school district and parents of our student volunteers. We received this consent by sending out letters, making the parents aware that this type of research is being conducted during school hours. We also inform parents that unless the information that the students provide us with is indicative of potential harm (such as self-harm or overdose), we will keep the findings anonymous.

To get volunteers to represent each grade level, we offered the incentive of giving five bonus points to the final grade point average of every student who participated in the study. Our sign-up sheets were left in front of the cafeteria and made available in between second and third period. We chose this time frame to give any students who may have missed the bus and gotten to school late a fair chance to participate. It is important to note that each grade had a sign-up sheet with ten lines (i.e. grade 9 had ten lines, grade 10 had ten lines, etc.). Once all lines were filled and participants were enrolled, we began. The data collection method used was a two-page Likert Scale survey.

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### Research Design

On the first page of the Likert Survey, students were asked to circle their grade level (9, 10, 11 and 12.) We then asked students to write their current grade point average. Lastly, we asked students to circle “yes” or “no” to the question “do you recreationally use substances?” Those who circled “no” were done, and able to go back to class. For all who circled “yes” to recreational use of substances, they were instructed to complete the 4-question scale on the second page of the survey. Our first question on the scale was “How often do you recreationally use substances?” The available answers were 0 to 2 times a week, 2 to 4 times a week and 4 to 7 times a week. Students were instructed to circle one of the available answer options. Our second question was “how often has drug use made you late/tardy to school?” The available answers were 0 times a week, 1 to 2 times a week and 3 to 5 times a week, and students were instructed to circle one of the answer options. Our third question on the survey scale was “on a scale of 0 to 3, (0 being the lowest, 3 being the highest) how confident do you feel in your ability to successfully complete assignments after recreational substance use?” The available answers to this question were 0 (not confident at all), 1 (somewhat confident), 2 (confident), and 3 (very confident), and students were instructed to circle one of these options. Our fourth and last survey question was “I ingest recreational substances before I take an exam.” Similar to the previous question, we used a scale ranging from 0 to 3 to respond to this statement. The available answers were 0 (Never) 1 (I have, but not regularly), 2 (Occasionally) and 3 (regularly.) After receiving all forty surveys, we compared the grade point averages of those who said “no” to recreational drug use and those who said “yes” to recreational drug use.

As you can observe, we used a mixed method—or convergent parallel data collection strategy. Our use of the convergent parallel data collection strategy via a survey consisting of

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Likert Scale-styled questions allowed us to collect our qualitative and quantitative data simultaneously. This method also afforded our research team the option of analyzing them separately.

### Measurement

<p><b><u>Operational (Dependent)</u></b></p> <p>Academic Performance</p>	<p><b><u>Conceptualization</u></b></p> <p>Within this research, we aim to understand how academic performance in students ranging from grades 9-12 within two high schools is impacted by the use of substances. We had all participating students identify their current GPA so we can compare grades amongst those who use substances versus those who do not.</p>
<p><b><u>Operational (Independent)</u></b></p> <p>Substance Misuse</p>	<p><b><u>Conceptualization</u></b></p> <p>We first asked students to identify whether or not they use substances. If yes, we asked a series of follow up questions via a Likert Scale regarding frequency of use and times in which substances are used.</p>

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### **Strengths and Limitations**

This method of data collection as well as our use of probability sampling had several strengths. We were not only able to measure grade point averages versus recreational substance use, but we were able to measure its impact across the 4 levels in the academic career of our students. The weakness of this methodology, though, is that it does not consider other factors.

When evaluating student academic performance, there are several things to consider, such as the presence of neurodivergence, times in which studying is taking place and where studying is taking place (just to name a few.) Another limitation of our research method is that we are relying heavily on the transparency of our participants. Even if they intend to be honest, though, we cannot guarantee that their answers are 100% correct due to things like memory lapses. The greatest limitation overall is that some of our more qualitative findings cannot guarantee 100% accuracy.

Our use of incentives helped us to quickly get samples to measure. Making this opportunity available on a “first come first serve” basis motivated students to sign up in a prompt manner. Conducting our research during school hours also expedited the process of data collection for our research team. Though our research was set to answer the specific question of “does substance misuse in high school adolescents’ impact academic performance?”, another benefit of our data collection method is that the findings can be used for further research analysis. Our research findings could possibly aid in facilitating a Drug and Alcohol prevention program in schools. For the task at hand, though, we were able to use our data to observe if there were any patterns present. For example, we compared and contrasted all ten findings from grade 9 with each other. This means that we took the highest and lowest grade point averages in

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grade 9 and observed if substances were present. We repeated this with grades 10, 11 and 12.

We were also able to use our data collection to measure the highest-grade point average out of all forty samples versus the lowest grade point average taken from all forty samples. We were also able to separate the data into two other categories; those who consume substances and those who do not. We asked questions like “what is the average grade point average amongst those who recreationally use substances versus the average grade point average of those who do not use substances.” Breaking our data findings up into these subcategories gave us extensive insight.

### **Conclusion**

Ultimately, we found that conducting this type of research on school grounds during school hours was the quickest and most effective way to secure participants. We reassured all participants individually that any information they presented would remain confidential (unless they expressed any plans of self-harm.) Offering this reassurance helped our participants to feel a bit more at ease. We were hopeful that this would lead to more transparency in their answers. We did not want our participants to feel that they were being judged or punished for what they chose to disclose. Though there are several ways to measure how substance misuse (if at all) impacts academic performance in high school adolescents, our team of researchers are confident that this method is the best.

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