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Why Taking "Smart Pills" Could be Stupid: Prescription Stimulant Misuse and Alcohol-Related Academic Consequences Among College Students

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Abstract

About 25% of college students report suffering academically due to their alcohol consumption. Such consequences include missing class, earning low exam and essay scores, and receiving poor grades in general. [1] Additionally, about 2.2% of individuals ages 18 to 25 reported misusing prescription stimulants (MPS) such as Adderall and Ritalin in the past month.[2] Whereas there are numerous motivations for MPS, such as weight loss, getting high, relaxation, and pain relief, the primary reason is to improve academic performance through intensified focus and attention to detail.[3] The pressure to abuse drugs may stem from the ever-increasing student perceived academic pressures. While many use stimulants as a way to *keep up*, it is proposed that students also take non-prescribed stimulants to *make up* for academic losses incurred from excessive drinking and partying. The purpose of the present study is to examine the relation between MPS and alcohol-related academic consequences. Data was collected through an online survey using snowball sampling at a midsize, Midwestern university. A one-way ANOVA showed that the MPS had a significant effect on the Classroom Attention, $F(1,20) = 5.24$, $p=0.033$, Classroom Effects, $F(1,23) = 8.83$, $p=0.007$, and Missed Class dimensions, $F(1,20) = 5.99$, $p=0.024$, but not the Academic Shortcut, $F(1,20) = 3.75$, $p=0.067$] dimension. These findings suggest that those who misuse prescription stimulants report higher levels of a variety of alcohol-related academic consequences than those who do not misuse prescription stimulants. The results indicate a need to target the more fundamental causes of alcohol and drug misuse among the college population, such as society's emphasis on excellence and academic competition, as a way to intervene in more mediating factors that point to misuse.

Keywords: Prescription Stimulants, Alcohol, Academic Consequences

1. Introduction

According to the 2015 National Survey on Drug Use and Health, 58% of full-time college students between the ages of 18 and 22 reported drinking in the last 30 days, with 37.9% binge drinking within that same time frame. Since heavy drinking often leads to social, academic, health, and personal consequences, these numbers are troubling. For instance, one-quarter of students report falling being academically as a result of drinking. However, the consequences can be much more lasting and severe, as almost 2,000 people between the ages of 18 and 24 die each year from unintentional injuries attributed to drinking.[4] Alcohol is often seen as a gateway to other forms of substance abuse. Alcohol use has been shown to predict the misuse of prescription stimulants (MPS), defined as using prescription stimulants such as Adderall, Ritalin, and Concerta in unintended ways.[5] Examples of MPS include using someone else's prescribed medication or using one's own prescription medication in excess doses.[6] Furthermore, MPS has been shown to predict the prevalence of problems associated with drinking.[7] This is concerning, as prescription stimulants are the second most used form of illicit drugs, behind marijuana, among college students.[8] In fact, 6.9% of college students reported

lifetime MPS, with past year prevalence seen as high as 25% at some universities.[9] The schools with higher prevalence rates tend to have more competitive admissions standards and are more academically rigorous, suggesting that students may abuse prescription stimulants in response to perceived academic pressure.[10]

1.1 Academic Consequences of Drinking

Heavy drinking during collegiate years can have numerous social, health, legal, and academic implications. While some of these consequences may seem short-term, many can actually have lasting impacts. For instance, when drinking affects academics negatively, it is likely to impact one's future job prospects and applications to graduate programs. According to Porter, heavy drinkers in college receive lower grades and therefore have suffering GPAs.[11] A reason for this could be that those who drink heavily spend considerably less time on academics and more time on recreation and sport activities. Another reason for this stems from the finding that students who engage in heavy drinking episodes have less meaningful engagement with faculty, something that can be extremely impactful for one's college experience.[12] While most studies on this topic look broadly into heavy episodic drinking, Singleton found that the number of drinks consumed on one drinking occasion predicted academic performance much more so than the frequency of heavy drinking occasions, suggesting that binge drinking plays a serious role in severity and prevalence of academic consequences.[13]

1.2 Misuse of Prescription Stimulants

Individuals who report lifetime MPS tend to drink more heavily and report higher levels of problems associated with drinking.[14] Furthermore, lifetime prevalence of prescription stimulant misuse has been shown to be higher among males, Caucasians, members of social fraternities and sororities, and those with poor academics.[15] While the present study looks at how students may misuse prescription stimulants in order to make up for academic losses due to alcohol use, the strain theory suggests that students who earn low grades perceive low social control and are therefore more likely to interact with delinquents and engage in deviant behaviors, such as the nonmedical use of prescription drugs.[16]

Several motivations for nonmedical use of prescription stimulants exist, including experiencing euphoria or a"high," to lose weight, to stay awake longer to party, or for perceived academic benefits, such as to increase productivity and alertness while studying. Among these academic motivations lies the perceived pressures to succeed academically that many students face from parents, faculty, themselves, and society in general, along with other financial, social, and workload-related demands that students are under.[17] As previously stated, academic enhancement is among the top motives for prescription stimulant use among college students, and those who begin using stimulants in college actually report this as a motive more frequently than students who begin using stimulants before starting college, suggesting that students are seeking out a way to enhance their academic performance.[18] Another possible reason for this finding is that some vulnerable college students cope with the new pressures resulting from college life by misusing prescription stimulants. While prescription stimulants can beneficially decrease inattentiveness and hyperactivity in individuals with ADHD, very few studies have shown any cognitive benefits to those using prescriptions who do not have ADHD or other attention-related disorders, and any benefits that those studies do show likely result from a placebo effect.[19, 20] Despite scientific studies that have shown no academic advantage to those who engage in MPS for nonmedical purposes, students continue to perceive an advantage, and therefore do not easily change their behavior. It is only when intervening on other factors related to MPS, such as alcohol use, that preventive measures and interventions show some impact.[21] The current study seeks to address this interrelationship between MPS and alcohol.

Several studies have noted prevalence rates of drinking and MPS among college students, the many consequences associated with drinking among college students, and the various motives that students have for misusing prescription stimulants. However, there is a gap when it comes to the association between alcohol-related academic consequences and the MPS. This study seeks to close this gap. By doing so, intervention programs can be created to target the source of the problem that is leading many college students to suffer academically, socially, physically, and in many other aspects of life as a result of alcohol and drug use. It is the hope that such programs would address the fundamental causes of alcohol and drug use, such as the perceived pressure for perfection that society has constructed.

2. Methodology

2.1 Participants

The sample for this study was composed of 543 undergraduate students at a midsize, Midwestern university. Females had a greater representation within the sample (77.4%, *n*=328) than males (21.9%, *n*=93). The average age of participants was 19.49 years. Freshman composed 51.5% (*n*=217) of the sample, with sophomores, juniors, and seniors making up 28.2% (*n*=120), 8.7% (*n*=37), and 9.2% (*n*=39), respectively. Participants identifying as White (Caucasian) were 66.1% (*n*=359) of the sample, while 3.5% (*n*=19) identified as Hispanic or Latino(a), 2.9% (*n*=16) identified as Black, African American, or Haitian, 8.7% (*n*=47) identified as Asian or Asian American, and 1.1% (*n*=6) identified as American Indian or Alaskan Native. While 16.9% (*n*=71) of participants reported a parental income less than $65,000, 13.6% (*n*=57) reported a parental income between $100,001 and $150,000, and 15.3% (*n*=64) reported a parental income above $200,000.

2.2 Procedure

Data was collected as on online, self-report questionnaire, and it was housed by Qualtrics. A snowball sampling method was used to gather participants via email and social media platforms. Preapproval of the survey was obtained by the Institutional Review Board. Incentives for participation included extra credit for classes approved by professors. The survey took about thirty minutes to complete. The initial set of questions was related to alcohol consumption. The questions regarding misuse of prescription stimulants and alcohol related academic consequences was ordered randomly for participants.

2.3 Measures

2.3.1 alcohol consumption

Participants were questioned first on their drinking behaviors in order to establish the frequency, amount, type, and duration of alcohol consumption. Amount of drinking was assessed through questions asking how many drinks participants had on average consumed on each day of the week within the past 3 months. Peak drinking was determined by asking for the highest number of drinks consumed on one single occasion within the past 3 months.

2.3.2 misuse of prescription stimulants

Participants were asked questions to establish whether they have been diagnosed with Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD), and whether or not they have been prescribed stimulants to help manage the symptoms. They were then asked whether or not they have ever misused their prescriptions, by either taking a larger dose than prescribed or for reasons other than medically intended. Participants were then asked questions regarding potential use of another individual's prescribed medication and the frequency and reasons for using them. Ultimately, these questions were designed to gauge the prevalence of the misuse of prescription stimulants among this sample.

2.3.3 Academic Consequences of Alcohol Consumption Scale

The scale to measure alcohol consequences looked at four different dimensions related to how alcohol consumption impacts one's learning.[22] These academic areas are Classroom Effects, Academic Shortcuts, Missed Class, and Classroom Attention. Classroom Effects relates to falling behind in class, being unprepared for class, performing poorly on assignments, and ultimately receiving lower grades. Academic Shortcuts relates to withdrawing from a class, cheating or plagiarizing on assignments, and turning in assignments past deadlines. Missed class relates to skipping or being tardy for class. Classroom Attention relates to inattention, distractedness, unpreparedness, or a lack of participation in class as a result of drinking. The scale has internal consistency. Cronbach's alphas, means, and standard deviations for each dimension can be found in Table 1. The scale is made up of 39 items, and participants were asked to rate the frequency of occurrence, ranging from 0 to 10 or more times, that he or she experienced each

item as a result of a drinking episode within the last 24-48 hours. The scale had 4 points, with options of "never," "1-2 times," "3-5 times," and "more than 5 times." For example, statements such as, "I fell asleep in class," "I went to class hungover," "I felt unprepared for class," and "I did not complete an assignment or project to the fullest of my ability" were rated.

Table 1. Cronbach's alphas, means, and standard deviations for the Academic Consequences of Alcohol Consumption Scale dimensions.

	Classroom Effects	Academic Shortcuts	Missed Class	Classroom Attention
Cronbach's Alpha	0.955	0.886	0.868	0.815
Mean (SD)	0.45 (0.61)	0.08 (0.23)	0.31 (0.50)	0.65 (0.68)

3. Results

3.1 Prevalence Of Alcohol Consumption

Over three-quarters (60.6%, *n*= 329) of individuals indicated that they have consumed alcohol at least once before. Of those that drink, the average said that they consume 3.0 (SD=2.22) alcoholic beverages per drinking occasion and acknowledged that they drink on average 2.0 (SD=1.41) days per week. Looking at just those who drink, the mode for peak drinking, defined as the maximum number of drinks that one consumes in a single drinking event, was found to be 5 drinks, but it ranged from 0 to 27.

3.2 Prevalence of MPS

Of the 543 participants, 7.4% (n=40) indicated that they have been previously diagnosed with Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD), and 6.3% (n=34) said that they currently have a prescription for stimulant medication such as Adderall, Ritalin, Concerta, Metadate, Methylin, Desoxyn, Cyclert, or Dexedrine. Of those who have ever had a prescription (n=37), 29.7% (*n*=11) admitted to taking their medication in excess or for a reason other than its intended use. Of these individuals who misused their medication, the intentions for doing so were overwhelmingly to concentrate better in class or to concentrate better while studying (54.5%, *n*=6 and 27.3%, *n*=3, respectively). Of the 543 participants, 12.5% (*n*=68) said that they have used someone else's medication, with 8.8% (*n*=48) of those individuals taking someone else's prescribed medication more than three times. The primary motivators for such actions were to be able to concentrate better while studying (8.7%, *n*=47), to be able to concentrate better in class (3.7%, *n*=20), and to feel better (2.2%, *n*=12), among other less common reasons.

3.3 Academic Consequences of Alcohol Consumption Scale

There were 39 total items across the four dimensions of this scale rating participants' frequencies of experiencing certain situations as a result of a drinking episode within the previous 24-48 hours. This scale proved to be reliable with a Cronbach's alpha of α=0.98. For instance, 9.6% (*n*=52) of participants were unable to finish homework or study for a test on one or two occasions. Additionally, 9.4% (*n*=51) went to work or school high or drunk, with 2.8% (n=15) experiencing this at least 5 times. Furthermore, 16.5% (*n*=90) of participants could not pay attention in class at least once, and 4.4% (*n*=24) had difficulty with this 5 or more times. The means and standard deviations for the Classroom Attention, Classroom Effect, Academic Shortcut, and Missed Class dimensions are presented in Table 2 along with the reliability statistics.

Table 2. Means, standard deviations, and Cronbach's Alphas for the four dimensions of the Academic Consequences of Alcohol Scale.

	Classroom Effects	Academic Shortcuts	Missed Class	Classroom Attention
Cronbach's Alpha	.965	.898	.881	.877
Mean (SD)	1.66 (.73)	1.16 (.36)	1.40 (.59)	1.48 (.67)

3.4 Alcohol Consumption, Misuse Of Prescription Stimulants, & Academic Consequences Of Alcohol Consumption

Table 3 shows the results of a one-way ANOVA indicating that the MPS had a significant effect on the Classroom Attention, $F(1,20) = 5.24$, $p=0.033$, Classroom Effects, $F(1,23) = 8.83$, $p=0.007$, and Missed Class dimensions, $F(1,20) = 5.99$, $p=0.024$, but not the Academic Shortcut, $F(1,20) = 3.75$, $p=0.067$ dimension.

Table 3. ANOVA results of MPS on Academic Consequences.

		Sum of Squares	df	Mean Square	F	Sig
Classroom Attention	Between Groups	2.645	1	2.645	5.235	.033
	Within Groups	10.107	20	.505		
	Total	12.753	21			
Classroom Effect	Between Groups	4.003	1	4.003	8.832	.007
	Within Groups	10.425	23	.453		
	Total	14.428	24			
Academic Shortcut	Between Groups	1.465	1	1.465	3.753	.067
	Within Groups	7.804	20	.390		
	Total	9.269	21			
Missed Class	Between Groups	2.940	1	2.940	5.993	.024
	Within Groups	9.811	20	.491		
	Total	12.750	21			

4. Discussion

The present study intended to address the relationship between the MPS and academic consequences resulting from drinking. It was found that the MPS predicts Academic consequences falling under the categories of Classroom Attention, Classroom Effects, and Missed Class, but not Academic Shortcuts. In other words, the MPS has a significant relationship with one's quality of school work, grades, preparedness and presentness in class, attention during class,

and other factors relating to the three formerly mentioned dimensions. On the other hand, the MPS does not have a significant relationship with factors associated with taking academic shortcuts, such as cheating or submitting assignments late.

While the prevalence rates for MPS vary widely among universities, the prevalence of MPS found in the present study falls within the range of data in the literature. The motives for MPS found by this study align with those that were found in the literature. For example, individuals indicated illegally taking prescription stimulants to concentrate better while studying, to concentrate better in class, to feel less tired in order to study longer, to feel less restless while studying, to keep track of assignments, to feel better, to get high, to prolong the effects of alcohol or other substances, and to lose weight. Regarding the Academic Consequences of Alcohol Scale, the item means noted in this study were consistently higher than those reported in the scale development, meaning the sample from this study reported a higher occurrence of academic consequences after drinking alcohol. Reasons for this are likely due to differences in the sample. For instance, the average age in the original study was 20.38 years, compared with 19.49 years in the present study.[23]

Several limitations, such as sample composition, could have affected the results of this study. Because females are more likely to respond to surveys, they made up the majority of the sample. This could have affected the data since decades of research have shown that women tend to drink less than men. Furthermore, this survey was distributed at a midsize, Midwestern university, which is not representative of universities all over the country. Additionally, Caucasians made up the largest racial group in the sample, and parental income far exceeded the national average family income. Wealthier individuals likely have greater access and funds to purchase alcohol and other substances, such as someone else's prescription stimulant medication. Underclassmen were represented in the sample more than upperclassmen. This could have affected results as studies have shown that one's motives for drinking or taking drugs change as one ages, as well as one's access to such substances.

Another limitation of the study is the self-report nature of the data collection. As previously mentioned, females are more likely to respond to such surveys, introducing a sample bias. Additionally, researching substance use is difficult, as the substances themselves can impact one's recollection of drinking events. Furthermore, people often underreport risky behaviors such as drinking and drug use. Also, it could have been difficult for one to determine whether or not an academic consequence was due to a drinking event, or if other factors such as poor sleep quality were to blame.

Whether or not taking prescription stimulants without a medical need, such as ADHD, actually produces cognitive and memory benefits is widely debated and studied. Studies conducted by Brumaghim and Klormart (1998), Callaway (1983), Clatworthy et al. (2009), and Kumari et al. (1997), have shown that adults without ADHD who took prescription stimulants experienced no effect on cognitive performance related to associative learning with word pairs, item recognition, spatial working memory and reversal learning, and motor sequence learning, respectively. Furthermore, when benefits are obtained, it is often merely the regarded as a result of the placebo effect.[24]

Regardless of any benefits that may or may not be obtained from prescription stimulants, there are numerous health risks associated with stimulant medications, especially when taken without the guidance of a physician. For example, seizures, cardiovascular events, anorexia, delusions, hallucinations, and insomnia have been recorded in cases where large doses of stimulants were taken. In fact, there have been several documentations of myocardial infarction in teenagers who have ingested larger doses than were prescribed (Lakhan, 2012, pg. 671).[25] Additionally, it has been well documented for decades that mixing alcohol with other drugs can result in severe adverse health consequences.

The findings from this study point toward a need for broad intervention in the way that students perceive the pressures placed upon them, which could lead them to feel that illegal use of prescription stimulants is the only way to make up for academic losses or keep up with expectations for their academic performance. More specifically though, interventions should target those who are at a greater risk for using both alcohol and prescription stimulants, especially without a prescription. Responsibility for this issue needs to be assumed by a wide range of individuals with connections to students who MPS in order to effectively address this issue. For instance, healthcare providers need to better recognize students who seek larger doses despite no medical need for a larger dose, as well as students who insist on more medication during specific times during the school year, such as during midterm and final exam weeks. Parents, professors, and other individuals close with college students should also assume more responsibility when it comes to understanding the numerous directions that students are pulled in when it comes to academics, extracurriculars, jobs, social relations, and preparation for the future. By recognizing the way that these obligations can contribute to building stress and anxiety, these individuals can take an active role in ensuring that students manage these pressures in a healthy way. Furthermore, students should assume a personal responsibility for their friends. Being able to identify any indications of heavy alcohol or drug use, and then knowing how to intervene in such situations in a safe, early, and effective manner could be beneficial in reducing the prevalence of MPS and academic consequences associated with alcohol. Ultimately, the roots of these public health issues run wide and deep and will require help

from many different sources. However, attention to this issue has never been more important as prevalence rates for MPS and alcohol consumption remain high among the college student population.

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