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# Prescription Stimulant Misuse Amongst University Students in Health Programs

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## Abstract

INTRODUCTION: Prescription stimulant misuse (PSM) is characterized by the consumption of stimulant substances for a motive other than its intended purpose. Psychostimulants are commonly prescribed for attention-deficit disorders. With an increasing number of attentiondeficit diagnosis' in young adults, there has also been a higher diversion rate of these drugs among peers. Stimulants have become the second most abused drug on college campuses, only behind marijuana. Consuming prescription stimulants (especially quick release formulations) in a way other than its intended purpose can create the potential for a high similar to that of illicit stimulants.

PURPOSE: The objective of this study is to obtain insight on the attitudes, motives, and behaviors behind PSM among college students in health-related majors.

METHODS: An anonymous survey was conducted at a medium-sized university in the southeastern United States, sampling a group of students in health-related programs. The survey was sent to program coordinators twice for them to distribute to the students in their respective programs. Data is being collected via Qualitrics. Two chi-square tests were conducted to analyze binge drinking and Greek affiliation variables and its relationship with prescription psychostimulant misuse. Additionally, two ANOVA tests were run to determine difference of means with academic and social benefits scores and misuse motives. A final ANOVA was run to analyze difference of means between misuser guilt scores and frequency of misuse.

RESULTS: None of our analyses determined a statistically significant relationship between variables. Researchers were able to identify that most misusers did so for academic purposes, which is consistent with current literature.

RECOMMENDATIONS: The study should be repeated with a larger and more diverse sample size. It is also suggested that studies be run between different schools within a university to compare misuse between curriculum types.

## Introduction

Amphetamines and methylphenidates such as Adderall, Ritalin, and Concerta are commonly prescribed psychostimulants to help patients combat attention-deficit/hyperactivity disorder (ADHD) (Fadaei et al., 2020). Psychostimulants are defined as any substance that has the capacity to create stimulation of the central nervous system (Favrod-Coune & Broers, 2010). Over the last few decades, there has been a substantial increase in ADHD diagnosis' in the United States, subsequently increasing the demand for prescription psychostimulants. Stimulants used to treat ADHD increased six-fold in the US between 1995 and 2008 (Edinoff et al., 2022). Current research suggests that prescription psychostimulants are considered to significantly improve cognitive performance deficits and do not pose any threat to cognitive impairment (Lappin & Sara, 2019). Despite amphetamine's medical uses, these drugs are fundamentally the same as illicit central nervous system stimulants and therefore have the same potential for misuse (Benson et al., 2015).

## Misuse on College Campuses

Psychostimulant misuse has become a progressively common issue on college campuses in the US. For the purpose of the survey, prescription stimulant misuse (PSM) is defined as any use of these substances for a purpose other than its prescribed intention. Individuals with or without a prescription can misuse these substances. These drugs have become more prevalent on campuses as many students with ADHD utilize prescription psychostimulants to manage their symptoms (Benson et al., 2015). The issue arises when reports reveal that the number of students misusing prescription stimulants surpasses the number of individuals who use it for its intended medical purpose (McCabe et al., 2006). Stimulant misuse is one of the most common forms of illicit drug use on college campuses, only second to marijuana, suggesting that diversion rates of these substances are high (Pino et al., 2017).

Most students without a prescription obtain these psychostimulants from friends or peers (McCabe et al., 2006). Those who redistribute their prescriptions have been found to do so for altruistic or monetary reasons. One study acknowledges that 75% of students who gave away their medications did so to help a friend experiencing high academic stress (Garcia et al., 2022). In a literature review by Benson, findings indicate that more than 50% of students think that obtaining a prescription stimulant for misuse is relatively easy (Benson et al., 2015). When a prescribed individual is skipping doses, a surplus of medication can become available increasing room for diversion (Garcia et al., 2022). Individuals desiring prescription stimulants also can obtain the medication without the help of a prescribed peer. Some students have purchased the drugs from black-market websites or exaggerated ADHD symptoms to a doctor to obtain a prescription (Edinoff et al., 2022; Rubin, 2022).

College students are most at risk of prescription drug misuse (Watkins, 2016). This issue has been discovered across all demographics of college students, with slight increased commonality among affluent white males in fraternity organizations. Although, findings related to demographic correlation and stimulant misuse are currently inconclusive as research is limited. In a 2021 survey, researchers identified that students in Greek life were three times more likely than their non-affiliated counterparts to misuse prescription stimulant substances (Cook et al., 2021). Social norms (drinking and party culture) in these organizations are suspected to promote substance misuse behavior that put pressure on members to conform. Binge drinking, marijuana, and other drug use display paralleled increases with prescription drug misuse across all demographic categories (Watkins, 2016).

## Appeal and Motives

Men tend to use psychostimulants for experimental purposes (i.e. to counter the effects of other substances being taken) while women tend to use them for their physical effects (i.e. weight lose, appetite suppressant, and study effects) (Watkins, 2016). Results of one study show that 78% of individuals who reported psychostimulant misuse do so for academic purposes, such as for a study aid (Cook et al., 2021). Another study suggests that extreme stress from competitive programs can result in students taking on unhealthy habits, such as PSM (Rattner, 2021). This is largely accompanied by various mental health issues such as anxiety and

depression. Despite common misconceptions, there is no current evidence stating that prescription psychostimulants can be used to improve academic performance. A survey done in 2018 showed that participants who abstained from PSM displayed a slight, but significant increase in GPAs when compared to participants who did utilize the substance as a study aid, that showed no increase in GPA (Arria et al., 2017).

Prescription psychostimulant misuse may also be inviting to those who do not misuse other illicit substances as perceived risk tends to decrease when the substance is coming from a trusted source, like a physician. Students who do not anticipate negative outcomes when misusing the drug are more likely to take it (Benson et al., 2015). Psychostimulant misuse has been recorded across all levels of higher education, with one study finding that prevalence rates of misuse among medical students across the country ranged from 5.2% to 47.4% (Edinoff et al., 2022). Misuse is more frequent among individuals attending college or university than their counterparts who are not. All literature suggested a need for continued research as there are no consistent findings that indicate a clear relationship between these independent variables and stimulant misuse.

Many students with misuse issues are weary of seeking help from professionals as they are afraid that it will greatly impact their success in their programs (Rattner, 2021). Especially within competitive health programs, such as nursing, students may be concerned that admitting to such a problem will be breaking their code of conduct and result in them being kicked out. In addition, lack of knowledge on available resources also makes students hesitant for assistance. **Therefore, the purpose of this study is to gain a better understanding of the attitudes, behaviors, and motives around abuse of prescription psychostimulants amongst college students in health-related programs.** Understanding student's motives and attitudes when abusing these substances will help researchers formulate suggestions on how to limit this issue on college campuses.

## Methods

### Procedures

The questionnaire for this survey was adapted from a study done at a similar southeastern US university (Cook et al., 2021). Prior to the publication of the survey, questionnaire and recruitment materials were approved by the research university's Human Subjects Research Institutional Review Board (IRB) (record no. H23-0408). Researchers indirectly recruited participants through the university email system. Since the focus was individuals enrolled in health and human service programs, a recruitment script including a link to the survey was sent to each program coordinator of qualifying majors. Program coordinators were asked to forward the script and survey to their students. The recruitment script included information about the significance of the study, estimated time of completion, and who to contact if further questions or assistance was needed.

The questionnaire was administered via a Qualtrics survey which students took online at a location and time of their discretion. Although it was estimated to take students between 5 and 10 minutes to complete, no time limit was imposed. Upon activating the link, students were

directed to an introductory page that outlined the details of the survey. Students were required to share their consent status before being allowed to access the full questionnaire. If students consented to participate, they were automatically redirected to confirm their age and status in one of the university's health and human services programs. If the participant was over 18 years of age and a student in a qualifying program, they were prompted to complete the rest of the demographic questions regarding age, gender, ethnicity, program name, year of study with the university, and if they were affiliated with Greek Life. Before being asked about their experience with prescription stimulants, researchers inquired about student's alcohol consumption. Students who reported having no prior history of PSM with or without a prescription, were redirected to the end of the survey. Participants who did admit to misuse of prescription stimulants were asked to complete additional questions surrounding their frequency, motives, and attitudes of misuse. Students had the option to decline to respond to any question they felt uncomfortable answering throughout the entirety of the survey. No participation incentives were used in this survey and all responses remained anonymous and secure with protected data sharing software.

Once the demographic questions were completed, students were asked to indicate if they have ever received a prescription for a psychostimulant. If they answered yes, the survey promptly ended. Those who have never received a prescription were asked if they have ever misused a prescription stimulant at any point during their college career. Those who did not disclose a history of PSM were routed to the end of the survey. Those who did report misuse were re-routed to complete the rest of the survey.

## Measures

### *Demographic and prescription measures.*

All students who met age and program requirements answered questions pertaining to their demographics at the start of the survey. They were asked to select from the following race/ethnicity categories they most closely identify with; African American/Black, Latinx/Hispanic, American Indian/Alaska Native, Asian/Asian American, European American/White, or Middle Eastern/Arab. Similarly, students were asked to select their current gender identity from options male, female, or non-binary. Next students were asked to indicate their current undergraduate year or if they were a graduate student and whether they have Greek affiliation with the university. Finally, students reported their alcohol consumption frequency so that researchers could determine if participants have binge drinking habits. For this study, binge drinking is defined as consuming four or more drinks on occasion. The collection of this data allows researchers to compare these results with PSM measures.

### *Psychostimulant Misuse and Motives*

Those who reported misuse were asked to indicate which year as a university student they first used the substance. Students were also asked to report the frequency of misuse from the most recent semester based on the following choices: 0-1 times, 2-3 times, 4-6 times, 7-10 times, more than 10 times. In addition, misusers were asked the pharmaceutical name brand of which psychostimulants they have used. Finally, students disclosed the motive behind their misuse habits by selecting from the following options: a recreational "party" drug, a study aid, an even

split of the two, not sure, or another reason. If participants selected "another reason", they would be prompted to explain in a short response box.

### *Experience Using Psychostimulants*

Participants who reported a history of prescription psychostimulant misuse were asked to answer a series of 10 questions regarding their experiences while on the drug. These statements and analysis scale were adopted from a similar study done in 2021 (Cook et al., 2021). Using a five option Likert scale (1-completely disagree, 2-slightly disagree, 3-neither agree nor disagree, 4-slightly agree, or 5-completely agree), students responded to statements that fall into two analytical sub-scales, social or academic benefit. Statements were structured as follows: "When I take one of these drugs, I feel …". The social benefit statements inquired about the individual's happiness, anxiety, and energy levels and also whether they felt excited or confident in social settings ($\alpha$= .86). The academic benefit had students share their experiences with focus, motivation, ability to study longer, ability to perform at a higher academic standard, and their confidence in academic settings ($\alpha$= .90). Responses from these scores were converted into numerical values to generate a "benefits score" for each motivation category. A higher score indicates a greater perceived advantage for the selected motive.

### *Guilt and Attitude Measures.*

The final section of the survey asked participants to report their feelings in the hours and days after misusing one of these substances. Using the same five-option Likert scale, students responded to eight questions that were adapted from the Guilt Inventory (Jones et al., 2000). The responses were then collected and averaged, with higher scores indicating a greater sense of guilt in the individual ($\alpha$= .84).

## Analyses

Participants frequency of misuse was characterized with the use of descriptive statistics. A chi-square analysis was run to determine whether students with a Greek affiliation are more likely than nonaffiliated students to partake in PSM. Researchers used a sample of the 111 students who fit the survey requirements for analysis. A chi-square analysis, using the same sample, was conducted to determine a potential relationship between binge drinking habits and PSM.

Using the subsample of the 26 participants who reported stimulant misuse during their college career (subsequently prompting them to complete the experience and attitude measures), a descriptive analysis was conducted to determine the frequency of users with academic motives compared to those with social motives. A series of analyses of variances (ANOVAs) using motivation type (academic or social) as the between-subjects variable and benefits score as the dependent variable. These tests allow researchers to compare the different reported motives for prescription psychostimulant misuse to the perceived outcomes while experiencing the effects of the drugs. An ANOVA is run for each of the types of benefits as dependent variables; academic and social. Finally, a third ANOVA is run with the frequency of use categories as the between-subjects variable and guilt scores as the dependent variable. This test allows researchers to

determine a relationship between the amount the drug is misused to feelings of guilt or regret within the individual.

## Results

### Participants

Undergraduate students at a medium-sized university in the southeastern United States were surveyed in the spring of 2023. Data from 39 individuals were removed as they either did not fit the inclusion criteria or declined consent to complete the survey. The remaining 111 student responses were comprised to make the sample of the study.

Of the sample (n= 111), 18 individuals (16.22%) reported being prescribed some form of psychostimulant by a licensed physician. 35 of the 111 (31.35%) students reported to using a prescription stimulant without a doctor's prescription. 26 of these 35 students misused a prescription psychostimulant during their time in college. These 26 were automatically redirected to complete the attitudes and experience measures. Demographic information for the base sample and all misusers sample is displayed in the graphic below.

Table 1. Demographic Characteristics of the Overall (N = 111) and Misuse (N = 35) Sample

| Variable | Base Sample (n=111) | Misuse Sample (n=35) |
|---|---|---|
| **Gender** | | |
| Female | 99 (89.19%) | 30 (85.71%) |
| Male | 9 (8.11%) | 4 (11.42%) |
| Nonbinary | 2 (1.80%) | 1 (2.85%) |
| Prefer not to say | 1 (0.90%) | 0 (0%) |
| **Age (median years)** | 21.61 | 22.34 |
| **Academic Year** | | |
| 1st year | 4 (3.60%) | 1 (2.85%) |
| 2nd year | 19 (17.12%) | 7 (20.00%) |
| 3rd year | 28 (25.23%) | 7 (20.00%) |
| 4th year | 51 (45.95%) | 16 (45.71%) |
| 5th+ year | 6 (5.41%) | 3 (8.57%) |
| Graduate student | 3 (2.70%) | 1 (2.85%) |
| **Race and Ethnicity** | | |
| African American/Black | 4 (3.60%) | 1 (2.85%) |
| American Indian/Alaska Native | 1 (0.90%) | 0 (0%) |
| Asain/Asain American | 3 (2.70%) | 0 (0%) |
| European American/White | 91 (81.98%) | 29 (82.85%) |
| Latinx/Hispanic | 5 (4.50%) | 2 (5.71%) |
| Middle Eastern/Arab | 0 (0%) | 0 (0%) |
| Multiracial | 7 (6.31%) | 3 (8.57%) |
| Prefer not to answer | 0 (0%) | 0 (0%) |

### Frequency of Psychostimulant Misuse

26 students, or 27.95% of the non-prescribed participants reported misusing a prescription psychostimulant in their lifetime. Majority of the students misused the drugs less than three times in the most recent semester. A little over half (51.85%) the participants used a psychostimulant only once in the last semester. Misuse frequencies are displayed in Table 2.

Table 2. Frequency of Psychostimulant Misuse Among the Non-Prescribed

| Frequency of Psychostimulant Misuse | # of students | Percent of Misusers |
|---|---|---|
| 0-1 times | 14 | 51.85% |
| 2-3 times | 7 | 25.93% |
| 4-6 times | 2 | 7.41% |
| 7-10 times | 1 | 3.70% |
| more than 10 times | 3 | 11.11% |
| prefer not to answer | 0 | 0% |
| **Total** | **27** | **100%** |

## Greek Affiliation and Substance Misuse

### *Greek Society Membership*

A chi-square analysis determining the dependence of prescription psychostimulant misuse to university Greek affiliation was run on the sample of 111 eligible survey participants. This test revealed no statistically significant relationship between the two variables, $\chi^2$ (2, N= 111) = .132, $p$=.717. In the sample of 111 students 17 (15.31%) reported being in a sorority or fraternity. Of those 17 students, 6 (35.29%) also reported prescription psychostimulant misuse.

### *Multiple Substance Misuse*

A chi-square analysis was run to determine if PSM is dependent on binge drinking habits. Survey participants indicated their frequency of binge drinking episodes, with most students (N= 111, 31.53%) partaking in 3-6 instances per month. Although, any student who reported at least one episode per month, was considered to partake in binge drinking behavior. The test reported no statistically significant relationship between the two health behaviors in the sample, $\chi^2$(2, N= 111) = 2.954, $p$= .086. It was found that 6 of the 31 participants (19.35%) who reported psychostimulant misuse also disclosed a history of binge drinking.

## Motives and Experiences Related to Misuse

22 of the 26 individuals (84.61%) who reported PSM during their college career expressed using the drugs for academic purposes, while only 1 student (3.84%) indicate social motives and 3 (11.54%) reporting an even split of both. Two ANOVAs were conducted to examine the relationship between a student's misuse motive and their reported experience while using the drug. The first ANOVA was run using the student's academic benefit score, while the second used the social benefits score. Neither test revealed statistically significant differences in

either social or academic benefit scores between motivation types. The mean of academic benefit scores was found to be 4.51, $F(2, 23)= 2.74$, $p= .086$, and 3.38 for the social benefit scores, $F(2, 23)= 2.59$, $p= .097$. Academic and social benefit score means across typologies are displayed in Table 3 below.

Table 3. Reported Social and Academic Benefit Scores Across Motivation Types

| **Reported Benefits** | Academic motive | Social Motive | Even Split |
|---|---|---|---|
| Academic benefit | 4.46 (.37) | 4.2 (--) | 4.93 (.12) |
| Social benefit | 3.26 (.63) | 3.8 (--) | 4.07 (.12) |
| | n= 23 | n= 1 | n= 3 |

**Guilt Among Various Frequencies of Misusers**

The final chi-square analysis was used to determine if frequency of misuse would affect the severity of guilt an individual feels after the effects of the psychostimulant wear off. The average guilt score was found to be 2.42 between all frequencies. The highest guilt score was reported by the individual with 7-10 uses in the most recent semester. Although, there was no statistically significant difference found between the various frequency level guilt scores, $F(4, 21)= 1.46$, $p= .25$. Descriptive statistics for the frequency categories in this ANOVA are found listed in Table 4 below.

Table 4. Descriptive Statistics Between Frequency Categories

| Frequency | *N* | *M* | *SD* | Lower Bound | Upper Bound |
|---|---|---|---|---|---|
| 0-1 times | 13 | 2.35 | 0.51 | 2.04 | 2.66 |
| 2-3 times | 7 | 2.49 | 0.56 | 1.97 | 2.99 |
| 4-6 times | 2 | 2.15 | 0.21 | 0.24 | 4.06 |
| 7-10 times | 3.6 | -- | -- | -- | -- |
| 10+ times | 3 | 2.4 | 0.66 | 0.77 | 4.03 |
| **TOTAL** | **26** | **2.42** | **0.55** | **2.21** | **2.65** |

## Discussion

35 of the 111 eligible survey participants reported having a history of prescription psychostimulant misuse. Greek affiliation and binge drinking variables had no revealed relationship with prescription psychostimulant misuse. Most students reported using the drug for academic motives, but all students, regardless of motive, had higher perceived academic benefits when using the substance. Students generally reported low guilt measures, regardless of frequency of use. The nearly unanimous use of psychostimulants for academic motives is contingent with previous literature and a factor that researchers hope university and health care professionals will consider when formulating prevention plans on campuses.

Survey results show that 18 students, or 16.22% of our sample, had been prescribed a psychostimulant, while psychostimulant misuse prevalence was nearly double this at 35%, suggesting high rates of substance diversion in these health programs. This finding is contingent with literature that implies students believe the drug is relatively easy to maintain (Benson et al., 2015). While this percentage is on the higher end of prevalence reports, this could be attributed to the study's small sample size (Edinoff et al., 2022). Most students did not display high levels of frequency as 77.78% of misusers took advantage of the drug 3 times or less in the most recent semester.

## Greek Affiliation and Substance Misuse

Current literature suggests that stimulant misuse behavior is slightly more common among Greek societies (Watkins, 2016). Contrary to suggestions of current literature, there was not a statistically significant relationship found between psychostimulant misuse and Greek affiliation among the survey sampled on this campus. Therefore, an individual at this university is not more likely to partake in stimulant misuse if they are a part of a Greek organization. This insignificance could be attributed to various factors such as small sample size in the survey or the university's overall low average of Greek affiliation among students. Individuals at this university may also be less likely to join a time-consuming extracurricular, such as Greek life, if they are already struggling to manage the tasking course load in a health and human service programs.

It is suspected, based off present literature, that those who partake in PSM are more likely to associate themselves with other negative health behaviors, such as binge drinking (Watkins, 2016). There was also no statistically significant relationship found between binge drinking behavior and psychostimulant misuse. An overwhelming majority (72.07%) of all survey participants reported a history of binge drinking at some point in their college career. This finding could be attributed to a wide acceptance of drinking and party culture in the university as a whole. Despite this majority, students with a binge drinking history were not found to be more likely to partake in PSM, when compared to their peers without a history of binge drinking behavior. 51 of the 111 individuals (45.94%) disclosed a history of binge drinking without prior history of PSM. Only 29 participants (26.12%) indicated that they partake in both binge drinking and PSM behaviors.

## Motives and Experiences Related to Misuse

### *Academic Benefits*

The one consistency found between this study and previous literature is the use of prescription psychostimulants to gain a perceived academic benefit. With the exclusion of one participant, nearly all individuals in the study reported the misuse of prescription psychostimulants for partial or complete academic motivation. This factor could be an indication of the stress students in health and human service programs are subject to (Rattner, 2021). Pressure to perform well academically in rigorous programs could lead to students misusing stimulants with perceived academic benefits. Academic benefit scores had a mean of 4.51 out of 5, revealing high academic benefit regardless of intrinsic motivation for use. This finding could

be attributed to the lack of variance in this test as only one individual reported misusing prescription stimulants for social purposes.

### *Social Benefits*

While mean social benefit scores were lower than reported academic benefit scores, there was still an absence of a statistically significant difference between scores of different motivation types. The average social benefit score was 3.38, with a slightly higher mean among individuals who indicated use of both motivation types (4.01). This data could be attributed to the physical properties the drug provides for a using individual, such as weight loss or appetite suppression (Watkins, 2016). According to the survey scale, a benefit score of 3 indicates neither positive nor negative association of social benefits to the effects of the drug. Therefore, academic benefit is more widely received across motivational categories. This could be associated with the negative side effects some participants reportedly experienced such as insomnia, twitching, anxiety, and paranoia, decreasing likelihood for positive social benefits.

## Guilt Among Various Frequencies of Misusers

Guilt scores were low for all participants, regardless of reported frequency of use, as the mean was found at 2.42. No statistically significant difference of means was found, indicating that a misuser's experienced guilt does not vary depending on frequency of misuse. All participants had a general lack of guilt after the effects of the drug wear off, which could be a reflection of user's perceived risks (Benson et al., 2015). If a student does not believe the substance could have negative implications, they will feel less guilty about using it, and more likely to repeat the behavior. Health professionals should take this into account when formulating substance use prevention measures in order to properly educate individuals on the dangers of prescription stimulants. The highest guilt score was reported by the individual in the "7-10 times" frequency category, with a mean of 3.60. This increase could be due to a lack of variance within this category as only one individual identified with the frequency variable.

## Study Limitations and Future Research Suggestions

This study was limited by the presence of external validity, since the sample was recruited from a single public southeastern university. Health and human service programs at this university are largely comprised of Caucasian females, which limits the diversity of the sample. 89.19% of our sample was female which suggests an improper representation of all genders in this study. This could also be an influencing factor of higher misuse prevalence among women in this study, when previous literature indicates men are more likely to misuse the drug (Watkins, 2016). There is also a lack of racial diversity in this study and future research is suggested to be more intentional about creating equity for representation.

Small sample size decreased variability in multiple instances of this study. It would be meaningful for researchers to conduct this study on a larger scale to increase variability and validity. Future studies should also explore PSM among other programs so that reports can be compared to determine if course rigor is a stressor related to likelihood of misuse. It should be recognized that despite lack of evidence that prescription psychostimulants provide direct

improvement of academic performance, many participants indicated high perceived academic benefits (Arria et al., 2018). This reflects a lack of education around PSM and calls upon health professionals to use reported motives and experiences to reshape prevention mechanisms.

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