

Spring 2015

# The nonmedical use of prescription stimulants among students with high academic standing

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The Nonmedical Use of Prescription Stimulants  
Among Students with High Academic Standing

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An Honors Program Project Presented to  
The Faculty of the Undergraduate  
College of Health and Behavioral Studies  
James Madison University

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In Partial Fulfillment of the Requirements  
for the Degree of Bachelor of Science

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by Megan Lynne Dwyer

May 2015

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Accepted by the faculty of the Department of Health Sciences, James Madison University, in partial fulfillment of the requirements for the Honors Program.

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PUBLIC PRESENTATION

This work is accepted for presentation, in part or in full, at the Honors Symposium on April 24, 2015.

## Table of Contents

Acknowledgements .....	3
Abstract .....	4
Introduction .....	5
Methods .....	8
Study Setting and Participants .....	8
Instrumentation .....	8
Procedures .....	9
Data Analysis .....	10
Results .....	11
Discussion .....	14
Appendix .....	16
References .....	20

## **Acknowledgements**

The completion of this honors thesis would not have been possible without the support and encouragement I received from my advisor, Dr. Katherine Ott Walter. I am truly appreciative of the time and efforts she has contributed to helping me complete this paper. I have learned a lot from her over the past couple years, and she has undoubtedly helped me to become a more well-rounded student. I would also like to thank Dr. Theresa Enyeart Smith, Dr. T.J. Hynd, and Ms. Lucy Green for their expertise and time. I am extremely grateful for the advice they all have given me.

## Abstract

College students report one of the highest rates of the nonmedical use of prescription stimulants (NPS). Research has shown that use is more common among students who have high levels of perceived stress, such as honors students. The purpose of this study was to determine whether honors students reported higher rates of NPS than their non-honors peers with high academic standing. It was hypothesized that honors students would report higher rates of use. The instrument used in this study was an email survey that was administered electronically through the online Qualtrics Survey system. The survey request was sent to 3,530 students and had an overall response rate of 27.0% ( $N = 1,216$ ). A binary logistic regression analysis was used to determine whether being an honors student was a predictor of NPS. Class rank, race, and gender were also analyzed as predictors. The results did not support the hypothesis that NPS was more common among honors students; however, class rank and gender were determined predictors of use,  $\chi^2(5) = 49.401, p < .05$ . Honors students may not have reported higher rates of NPS but the link between stress and NPS needs to be further investigated. Suggestions for future research were given.

## **Introduction**

Within the past eight years, the United States has seen a significant increase in the diagnosis of attention deficit hyperactivity disorder (ADHD) (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2013). This surge in new cases has spurred a growth in the availability of prescription stimulants (e.g., Ritalin, Adderall, Dexedrine, Concerta), which are used in the treatment of ADHD (Visser et al., 2013). Researchers believe this recent growth in availability has caused an increase in the nonmedical use of prescription stimulants (NPS), or the use of ADHD medication without a prescription from a medical professional (Johnston et al., 2013).

NPS has become an increasingly important public health concern over the past decade, particularly among college students (Johnston et al., 2013). In fact, stimulant drugs are the most common form of psychotherapeutic drug abused by college students today (McCabe, Knight, Teter, & Wechsler, 2005). Moreover, prescription stimulants are currently one of the only drugs illegally used in higher rates among college students than among individuals of the same age that are not enrolled in college (Johnston et al., 2013).

Most students who participate in NPS report doing so for the effects on cognition, which include increased alertness and improved motivation (Gross, 2013). Through the use of quantitative surveys and in-depth qualitative interviews, DeSantis, Webb, & Noar (2010) found that a vast majority of the college students who participated in their study and used prescription stimulants for nonmedical reasons did so to stay awake and study longer, rather than to simply get high. A similar study found that the three most common reasons for use were to perform better on schoolwork, receive higher test grades, and focus more in class (Wayandt et al., 2009).

These cognitive effects have encouraged students nationwide to participate in NPS, but some individuals are more likely to use than others. Research has shown that males report using

prescription stimulants for nonmedical purposes at higher rates than females (Johnston et al., 2013) and Caucasians report higher levels of use than any other race (DeSantis, Webb, & Noar, 2010). In fact, Teter and colleagues (2006) found that Caucasians are three times more likely to participate in the nonmedical use of prescription stimulants than African Americans and twice as likely when compared to Asians. Garnier-Dykstra and associates (2012) found similar results in their study and also reported that upperclassman were more likely to engage in NPS than underclassman.

Although research has been able to pinpoint certain demographics that can be predictors of NPS, inconsistencies exist regarding the percentage of individuals who have engaged in NPS among the college student population. The National Survey on Drug Use and Health found that 6.4% of college students had reported using these drugs without a prescription (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009). A similar research study found that 31.0% of college students in their sample reported engaging in NPS at least once in their lifetime (Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012). Additionally, a study by McCabe, West, Teter, and Boyd (2014) found that 12.7% of students within their sample had taken prescription stimulants for nonmedical reasons at some point in their lifetime. It is important that further research on NPS among college students be conducted in order to address the gap in the percentage of use among the population.

Although NPS varies depending on the study, high rates of use have been consistently reported during high stress periods on college campuses and are strongly associated with psychological distress and internal restlessness (Wayandt et al., 2009). For example, Moore et al. (2014) found that students are more likely to take prescription stimulants during midterm and finals weeks, rather than on the first week classes begin. The positive correlation between

academic stress and the nonmedical use of prescription stimulants has created a need for further research on use among students who consistently experience high levels of academic-related stress. Honors students are one group of individuals who report high levels perceived stress (Rice, Leever, Christopher, & Porter, 2006). Students in the Honors Program at JMU are required to keep a 3.25 grade point average (GPA), submit a senior honors thesis before graduation, and complete an additional 18 credit hours of honors coursework (James Madison University, 2014a).

It is important to note that research examining the use of prescription stimulants for nonmedical purposes among honors students is lacking. Due to the lack of knowledge on this particular subject, further research on NPS among honors students has become exceedingly important. The purpose of this study was to discover whether honors students at James Madison University (JMU) display higher rates of the nonmedical use of prescription stimulants when compared to their non-honors peers with high academic standing.

## **Methods**

### **Study Setting and Participants**

Participants in this study included full and part-time students currently enrolled at JMU who were 18 years of age or older. In order to determine whether honors students were more likely than non-honors students with high academic standing to engage in NPS, students who made the President's or Dean's List in the Spring 2014 semester were identified and included in the comparison group (non-honors students).

The comparison group was chosen because their academic performance is similar to honors students but have fewer academic requirements, which may be seen as additional stressors. To qualify for the President's List at JMU a student must earn at least a 3.900 GPA (James Madison University, 2014b). A 3.500 to 3.899 GPA is needed to qualify for the Dean's List (James Madison University, 2014b). Unlike honors students, students who qualify for the President's and Dean's List are not required to complete additional projects or coursework. Due to the additional academic requirements placed on honors students, it was anticipated that honors students would show higher rates of NPS than their peers who are not in the Honors Program with high academic standing.

### **Instrumentation**

The instrument used for this study was adapted from the Ohio State Student Survey on the Non-medical Use of Prescription and Non-prescription Medications (A. McDaniel, personal communication, August 27, 2014). It was originally used to assess the nonmedical use of prescription and non-prescription medications among Ohio State University students at the Columbus campus. Some of the questions were modified in order to make the survey relevant to JMU students and to apply to this study.

The survey consisted of a total of twenty questions. The first five questions were constructed to collect demographic information. The remaining 15 questions were formulated to gather data concerning frequency of use, accessibility, reasons of use, and associated negative effects. These questions were presented in multiple choice and Likert scale formatting (see Appendix). The finalized instrument was administered electronically through the Qualtrics Online Survey system.

### **Procedures**

Upon receiving approval from JMU's Institutional Review Board (No. 15-0119), the email addresses of students in the Honors Program along with those who qualified for the Dean's or President's Lists in the Spring 2014 semester were obtained from the Registrar's office. Students who had graduated in the spring of 2014 were eliminated to ensure that only current students were surveyed. Individuals who were both in the Honors Program and on the President's or Dean's List were also eliminated from the contact list to ensure that participants in the Honors Program were categorized and analyzed solely as honors students, as well as to avoid counting one person in the sample more than once. The master list of emails consisted of 992 honors students, 494 students from the President's List, and 2,044 students from the Dean's List.

Once all the emails of current undergraduate students in the Honors Program or on the Dean's or President's List were gathered, a mass-email was sent out requesting their participation in the study. This email contained a brief explanation of why the research was being conducted (for an Honor's thesis), the purpose of the study, and an expression of appreciation for all responses. A direct Qualtrics link to the questionnaire was inserted into the email. Two reminder emails were sent following the initial request for participation. The reminders were sent at one and two week intervals following the initial survey request. This technique of sending two

reminder emails after sending the initial survey request to increase the sample size was adopted from Don Dillman's book, *Mail and Internet Surveys: The Tailored Design Method* (2000).

Upon completing the survey, the students' data was automatically stored within the Qualtrics database. Exactly 1,216 students responded to the survey (34.4% overall response rate), of which 419 were honors students. No identifying information was taken from the participants in the study, including IP addresses. Only the researchers had access to the data. The information was stored on a password-protected computer and will be destroyed after the completion of the study. These measures were taken in accordance with the research proposal for this study sent to and approved by JMU's Institutional Review Board.

### **Data Analysis**

Upon completion of the data collection process, the data was then exported to a data analysis program called, Statistical Package for the Social Sciences (SPSS), version 22. Students who were not in the Honors Program but reported they were on the Dean's or President's Lists were recoded as "non-honors students." Students who reported that they were in the Honors Program remained coded as "honors students". The hypothesis was tested using a binary logistic regression to determine whether the dependent variable, NPS, could be predicted by being in the Honors Program, as well as by demographic data (race, class rank, & gender).

## Results

The sample ( $N = 1,216$ ) for this study was 88.1% Caucasian, 76.2% female, and 68.3% upperclassman, meaning junior and senior students. Overall, the lifetime prevalence rate of NPS among honors and non-honors students combined was 27.0% with a 9.1% prevalence rate within the last 30 days.

A binary logistic regression was performed to determine whether being an honors student was a predictor of NPS. Class rank, race, and gender were also analyzed as predictors of NPS. The logistic regression model used in this study was statistically significant,  $\chi^2(5) = 49.401$ ,  $p < .05$  and correctly classified 72.8% of the cases. The positive predictive value was 73.0%; meaning, 73.0% of the individuals predicted as having engaged in NPS were correctly identified. The negative predictive value, or the percentage of individuals who were correctly predicted as not having engaged in NPS, was 73.0%.

As previously mentioned, honors students were expected to engage in the nonmedical use of prescription stimulants in higher rates than the non-honors students (President's List and Dean's List). This hypothesis was not supported by the data. The logistic regression analysis determined that being an honors student did not significantly predict the nonmedical use of prescription stimulants. As seen in Figure 1, 8.1% of students in the Honors Program and 11.0% of non-honors students with high academic standing had used prescription stimulants without a prescription in the last 30 days. Lifetime prevalence was 20.2% for honors students and 31.9% for non-honors students.

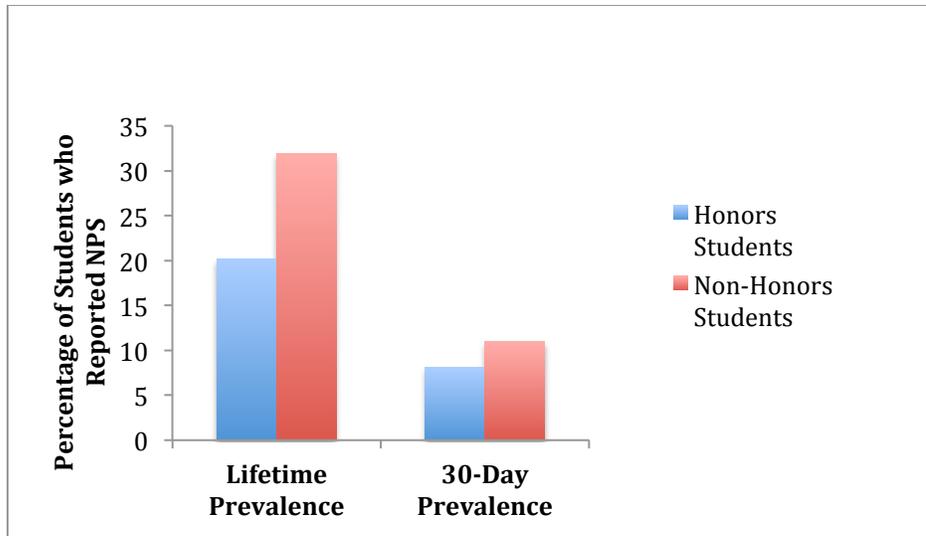


Figure 1. Prevalence of NPS among honors and non-honors students.

Although the sole dependent variable of being an honors student did not predict NPS, certain demographics did indicate significance. Class rank significantly predicted an individual's likeliness to engage in NPS. A chi-square test indicated that participants who were upperclassman (juniors and seniors) were significantly more likely to use prescription stimulants without a prescription than were underclassman (freshmen and sophomores),  $\chi^2(1) = 9.321$ ,  $p = .002$ . As seen in Figure 2, about 30.1% of upperclassman and 20.6% of underclassman in the sample had used prescription stimulants without a prescription at least once in their life. There was also a significant difference in use between males and females. Being a male significantly predicted NPS, meaning males were more likely to use prescription stimulants without a prescription than females  $\chi^2(1) = 26.362$ ,  $p = .000$ . The results seen in Figure 3 show that 40.5% of males and 23.0% of females in the study had engaged in NPS at least once in their lifetime. Race was not a significant predictor of NPS. Thus, gender and class rank were the only predictors of NPS in this study.

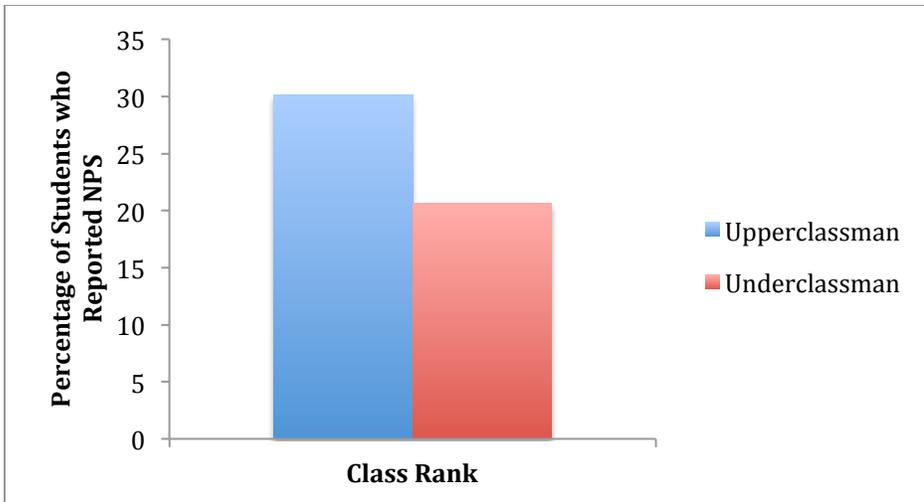


Figure 2. Prevalence of NPS among upperclassman (seniors and juniors) and underclassman (sophomores and freshmen).

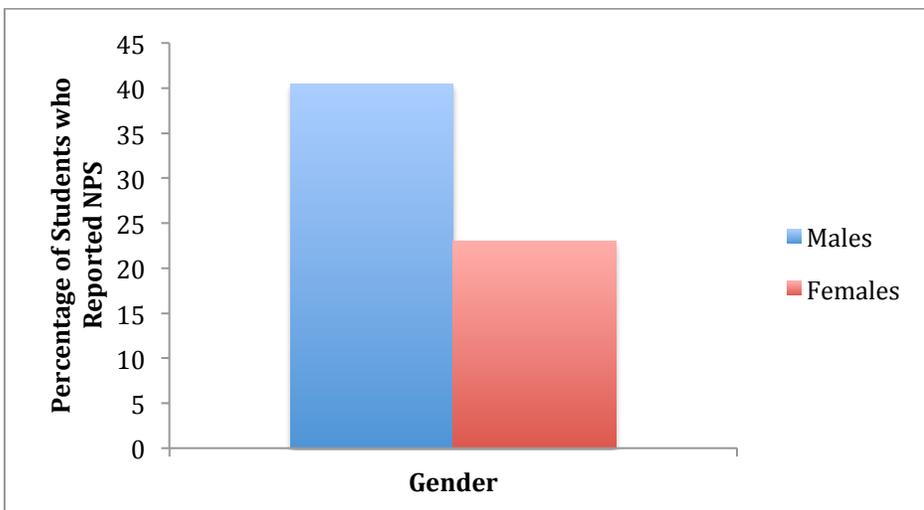


Figure 3. Prevalence of NPS among males and females.

## Discussion

Findings indicated that honors students were not more likely than non-honors students to report NPS. A possible explanation for these results could be that honors students and students who have made the Dean's and President's List are too similar. Both groups represent individuals with high academic achievement. Although honors students have additional academic requirements, their stress levels could be similar to the students on the Dean's and President's Lists as these students are putting the required effort to achieve a high academic standing.

Although the hypothesis was not supported, results did indicate that gender and class rank were significant predictors of NPS, which is similar to the findings in previous studies. Males were more likely than females to participate in NPS. This finding supports research in the field (Johnston et al., 2013). Upperclassmen were also more likely to use when compared to underclassman. This result confirms previous findings as well (Garnier-Dykstra et al., 2012). Related research has also defined race as a predictor of NPS (Teter et al., 2006); however, these findings were not supported by the current study. As mentioned in the results, a vast majority (78.3%) of the sample was Caucasian. The lack of racial diversity in this study may be an explanation as to why race was not determined as a significant predictor of NPS. This can be seen as a limitation of the study.

Other limitations to this study include the proportion of males compared to females who completed the survey. The sample was 76.2% female, which could affect the external validity of the experiment. This experiment was also only conducted at one university (JMU). Results may vary if the survey was distributed at a variety of schools with a variation in their demographic make up.

Recommendations for future research include further exploration of NPS among students with high academic standing. The lifetime prevalence rate of use within this sample was 27.3%. This is more than four times what was reported in the National Survey on Drug Use and Health (SAMHSA, 2009). This percentage is more closely related to the findings of Garnier-Dykstra and associates (2012), who reported that 31.0% of the college students in their sample had used prescription stimulants without a prescription at least once in their lifetime. Considering the lifetime prevalence rate was relatively high in this sample, academic standing in general should be researched as a predictor of NPS.

Another recommendation for future research would be to explore the correlation between other stressors and NPS. An increase in academic coursework may not have been a predictor of NPS, however, other situations that induce high levels of perceived stress could be significant. For example, the number of credits taken, independent of the grade achieved by the student, may indicate significant predictive power.

This study was conducted in order to expand the scientific knowledgebase on the use of prescription stimulants without a prescription among college students. Since NPS is increasing in popularity among college students it has become increasingly important for this particular population to be informed on the consequences of NPS. It is also pertinent for college faculty and administration to be aware of this information in order to develop social norm campaigns and prevention programs.

## Appendix

1. What is your class rank?

Freshman  
Sophomore  
Junior  
Senior

2. What is your race/ethnicity?

American Indian/Alaskan Native  
Asian/Pacific Islander  
Black (non-Hispanic)  
Hispanic  
White (non-Hispanic)  
Other

3. What is your gender?

Female  
Male  
Self-define

4. Are you in the Honors Program at James Madison University?

Yes  
No

5. How often do you generally use prescription stimulants (e.g., Ritalin, Adderall, Dexedrine, Concerta) that were not prescribed for you and how often do you believe that other students at JMU generally use the prescriptions stimulants that were not prescribed for them?

	Self	Other
Never		
At least once per year		
At least once per quarter		
At least once per month		
At least once per week		
At least once per day		
I'd rather not say		

6. When did you first start using prescription stimulants that were not prescribed for you?

College  
High School (grades 9-12)  
Middle School (grades 6-8)  
Elementary School (grades K-5)  
Never  
I'd rather not say

7. In your lifetime, how many times would you estimate that you have used prescription stimulants that were not prescribed for you?

- Never
- 40 or more times
- 20-39 times
- 10-19 times
- 6-9 times
- 3-5 times
- 1-2 times
- I'd rather not say

8. In the past twelve months, how many times would you estimate that you have used prescription stimulants that were not prescribed for you?

- Never
- 40 or more times
- 20-39 times
- 10-19 times
- 6-9 times
- 3-5 times
- 1-2 times
- I'd rather not say

9. In the past 30 days, how many times would you estimate that you have used prescription stimulants that were not prescribed for you?

- Never
- 40 or more times
- 20-39 times
- 10-19 times
- 6-9 times
- 3-5 times
- 1-2 times
- I'd rather not say

10. How easy is it to obtain prescription stimulants that were not prescribed for you?

- I don't know
- Very difficult
- Somewhat difficult
- Somewhat easy
- Very easy
- I'd rather not say

11. Where do you typically obtain prescription stimulants that were not prescribed for you?

I'd rather not say  
 From a friend  
 From a peer who is not a friend  
 From a relative  
 From a pharmacy  
 From a drug dealer  
 By traveling abroad  
 Through the Internet  
 I do not use these types of drugs without a prescription

12. Which of the following are/were reasons for your use of prescription stimulants (e.g., Ritalin, Adderall, Dexedrine, Concerta) that were not prescribed for you (Check all that apply)? Why do you believe that other students at JMU generally use prescription stimulants (e.g., Ritalin, Adderall, Dexedrine, Concerta) that were not prescribed for them (Check all that apply)?

	Self	Other
To improve concentration		
To increase alertness		
To do better in school		
To get high		
To counter the effects of other drugs		
To help lose weight		
Because of an addiction		
To see what it was like		
To feel better		
To escape from reality		
Because of a personal/emotional problem		
Because they are felt to be safer than street drugs		
Because they are not felt to be as addictive as street drugs		
Other		
I'd rather not say		

13. Please indicate whether you have ever experienced the following effects from your use of prescription stimulants without a prescription.

	Yes	No	I'd rather not say
Have you ever not been able to stop using prescription stimulants without a prescription when you wanted to?			

Have you ever felt bad or guilty about using prescription stimulants without a prescription?

Have you ever engaged in criminal activity in order to obtain prescription stimulants without a prescription?

Have you ever felt that your relationships with other people were negatively affected by your use of prescription stimulants without a prescription?

Have you ever felt that your relationships with other people were positively affected by your use of prescription stimulants without a prescription?

Have you ever experienced withdrawal (felt sick) symptoms when you stopped taking prescription stimulants without a prescription?

Have you ever experienced medical problems because of your use of prescription stimulants without a prescription?

Have you ever experienced legal problems as a result of your use of prescription stimulants without a prescription?

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