Illicit Use of Prescribed Stimulant Medication Among College Students

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Abstract

The purpose of this project was to investigate the illicit use of stimulant medications at a Midwestern university. The project employed a questionnaire to: (a) examine the extent to which stimulant medications prescribed for attention deficit/hyperactivity-disorder were used illicitly by university students; (b) determine the reasons for abuse of stimulants by college students; and (c) identify the predicting factors for the illicit use of prescribed stimulant medication. Results revealed that 17% of 179 surveyed males and 11% of 202 females reported ever using prescribed stimulant medication illicitly. Forty-four percent of surveyed students stated that they knew students who used stimulant medication illicitly. Prescribed stimulants were used illicitly for both academic and recreational reasons. Students reported time pressures associated with college life, and stimulants were reported to increase alertness and energy. Regression analysis revealed factors that predicted illicit use for both males and females.

Index Words: stimulant medication, illicit use, college students, attention deficit hyperactivity disorder

Attention-Deficit/Hyperactivity Disorder (ADHD) occurs in approximately three to seven percent of school-aged children according to the Diagnostic and Statistical Manual of the American Psychiatric Association[1]. The incidence of stimulant treatment in the school-age population has increased dramatically in the past few years as the acceptance of pharmacotherapy for ADHD increased. In a national survey of 19 school districts, Frankenberger, Lozar, and Dallas[2] reported that only 1.47% of the students surveyed were diagnosed with ADHD and were receiving treatment with stimulants. More recently, LeFever and Dawson[3] reported mean rates of ADHD and concomitant use of stimulant medication as high as 10% in some school districts. LeFever and Dawson[3] also found that 17% of white males in grades 2 through 5 were receiving stimulant medication. More recently, Rowland, Umbach, Stallone, Naftel, Bohlig, and Sandler[4]completed a school-based survey that revealed 10% of the 6099 children included in the study had been identified as having ADHD and were being treated with stimulant medication. Angold, Erkkanli, Egger, and Costello[5] examined the use of prescribed stimulants in relation to the diagnosis of ADHD in a sample of children ages 9 to 16 from western North Carolina. They reported that stimulant treatment was being used in ways substantially inconsistent with current diagnostic guidelines. While only 3.4% of children assessed met the full criteria for ADHD, 7.3% received prescriptions from physicians for stimulants. The authors concluded ADHD was over-diagnosed in their sample. In support of this contention, Kube, Peterson and Palmer[6] reported that, of the children referred for ADHD evaluation in their study, only 43% had a final diagnosis of ADHD. In a national study of the prevalence of prescription stimulant use in children 5 to 14 years old, Cox, Motheral, Henderson, and Mager[7] reported ADHD diagnosis was most frequently identified in white males coming from small families who lived in higher income communities.

The increase in stimulant use is also evinced by data from the United States Drug Enforcement Administration[8]. According to DEA data, there was nearly a 900% increase in methylphenidate (Ritalin) production from 1990 to 2001. With the introduction of Concerta and Metadate, the

production of methylphenidate has increased by 40% from 2000 to 2002. Further, from 1993 to 2001 the production of amphetamines (Dexedrine and Adderall) increased by 5767%.

In a study of middle school and high school students, Moline and Frankenberger[9] found 34% of students taking ADHD medication (stimulants) reported being approached to sell or trade their medication. They also found 53% of non-medicated students reported that some students treated with stimulants gave away or sold their medication. In other studies, approximately 15% of students receiving stimulant medications reported being approached to sell their medications[11].It should be noted that the Musser et al. study revealed that only one of the 50 surveyed school administrators was aware of the illicit use of ADHD medication in their schools[11].

Not only is the illicit use of stimulant medication an issue at middle and high schools, but it also occurs at colleges and universities. The college years, for some, are a time of psychoactive drug use, and recreational stimulant use is higher among 18 to 25 year-olds than in any other age group[12]. In the only study of its kind, Babcock and Byrne[12] investigated the recreational use of methylphenidate at a Massachusetts public liberal arts college. They reported that 16% of the students had tried methylphenidate recreationally, and 31% of the students believed that Ritalin was a drug of abuse on their campus.

Methylphenidate (Ritalin, Concerta, and Metadate) and amphetamine (Adderall, Dexedrine, and Desoxyn) are classified as Schedule II medications, meaning that they are controlled substances with a high potential for abuse[13]. A recent 13-year prospective study by Barkley, Fischer, Smallish and Fletcher[14] investigated whether or not the treatment of ADHD with stimulants contributed to drug abuse. They reported that stimulant treatment in childhood or in high school did not increase the risk of ever having tried most illegal substances by adulthood except for an increased risk of using cocaine, and similarly, high school stimulant treatment was associated with a greater frequency of cocaine use[14]. In light of these findings, and the fact that there has been only one investigation examining the illicit

use of prescribed stimulants on a college campus, along with the high abuse potential of stimulant medications used for ADHD, it is imperative that the problem of the illicit use of stimulant medication be further investigated.

The purpose of the current study was to examine the extent that prescribed stimulant medication for ADHD was used illicitly by students at a Midwestern college campus. In addition, the study was designed to determine why students used prescribed stimulants illicitly and under what circumstances the stimulants were used illicitly. Finally, factors that predicted illicit use on the part of the students were addressed.

Method

Participants

This project was approved by the University of Wisconsin-Eau Claire Institutional Review Board for the protection of human subjects. Participants were selected via three methods. First, the university registrar's office supplied a list of 500 female and 500 male residence hall occupants from approximately 4,000 residents. The randomly selected students were sent a questionnaire, with all students living in residence halls. A cover letter explaining the purpose of the study, and a questionnaire was mailed to each participant. Participants were informed that by completing the questionnaire they were giving informed consent. Two weeks after the initial mailing, a second questionnaire was sent to those who had not previously responded. Of the mailed questionnaires 171 participants (40 males and 131 females) responded over a four week period. Second, researchers held three sessions open to introductory psychology students who could receive class credit by completing the questionnaire. Third, researchers also went door to door on male wings in residence halls and participants were selected based on their presence and willingness to participate in the study. From these last two methods of data collection 210 (139 males and 71 females) questionnaires were collected (116

residence hall visits and 94 intro psych volunteer session) for a total of 381 participants (179 males and 202 females) serving in the current study.

Instrument

All participants completed a questionnaire that consisted of 85 questions designed by the investigators based on the survey prepared by Moline and Frankenberger[9]. The first section consisted of eight demographic and personal information questions. The remaining 77 questions utilized a Likert-scale format (e.g. 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree) to assess the participants' opinions, attitudes and experience related to stimulant medication. These questions were further separated into two sections for statistical analyses. The first section dealt with general knowledge of stimulants and the illicit use of stimulant medication. The second section dealt with specific information from individuals who reported having taken stimulant medication illicitly. Stimulant medication was defined on the survey to include methylphenidate (Ritalin, Concerta and Metadate) and amphetamine (Adderall, Dexedrine and Desoxyn).

Means were calculated for all survey questions. When a mean was located between 4.00 and 5.00, it was labeled "agree." If a mean for a particular response was 3.50 to 3.99, it was labeled a "tendency to agree." When a mean was located between 2.50 and 3.49, it was labeled "neutral." When a mean was 2.49 to 2.01 it was labeled a "tendency to disagree." Means of 2.00 or below were labeled "disagree."

Results

The mean age for the participants was 19.39 (SD = 1.66). Forty-six percent (n = 174) of the participants were freshmen, 36.2% (n = 138) were sophomores, 10.2% (n =39) were juniors and 8% (n = 30) were seniors. Forty-seven percent (n = 179) of the participants were male, and 53% (n = 202) were female. Three percent (n=13) had currently or previously been diagnosed with ADHD, and approximately 3% (n =10) were currently taking a prescription medication for ADHD. Interestingly, the

most common medication for our sample of college students was antidepressants represented by 7% of the students.

Rate of Illicit Use and Sex Differences

The participants were asked to report their opinions, attitudes, and experiences with stimulant medications used to treat ADHD. The means and standard deviations for the first section of questions are presented in Table 1. A one-way ANOVA was employed to determine whether there was a significant difference between males and females on any of the Likert questions. There was a significant difference found between males (M=1.97, SD=1.20) and females (M=1.69, SD=1.06) on question 25 ("I have taken stimulants for non-medical purposes."). This question was of particular interest because it was the question used to determine those students whose responses were analyzed for the second section of the survey. On question 25, 13.7% of participants indicated taking stimulants illicitly, and more specifically 17% (n=30) of males and 11% (n=22) of females indicated taking stimulants illicitly. Interestingly, four of the 10 students who were prescribed stimulants also reported illicit use of the medications. Further analysis of survey questions revealed that there was a significant difference between males (M=3.28, SD=1.20) and females (M=3.67, SD=.93) on question 1 ("I am aware of the symptoms of ADHD."). There was also a significant difference found between males (M=3.68, SD=1.10) and females (M=4.10, SD=.88) on question 4 ("I feel pressured by my time commitments e.g. School, work, extracurricular activities, family."). A significant difference was revealed between males (M=2.72, SD=1.39) and females (M=2.35,SD=1.38) on question 11 ("I know students I can get stimulants from.") Thirty-seven percent (n=67) of males and 29.2% (n=59) of females agreed that they knew students from whom they could get stimulants. Because there was only a significant difference between males and females on four questions data were combined and presented in an aggregate format in Table 1.

General Attitudes Related to the Use of Stimulants

Analysis of Table 1 revealed that participants tended to agree with question 2, ("I feel that too many children are diagnosed with ADHD.") (M=3.54, SD=.96). Participants also tended to agree on question 4, ("I feel pressured by my time commitments (e.g. school, work, extracurricular activities, family.)") (M=3.90, SD=1.01), and question 6, ("Sleepiness and fatigue make it difficult for me to study.") (M=3.51, SD=1.08).

Other questions that were of interest were questions 9 and 14. The agreed and strongly agreed categories were combined and reported as participants agreeing with the particular statement. Question 9 and 14 reflected participants' knowledge of the illicit use of stimulant medication. In response to question 9, 43.8% (n=167) of participants agreed that they knew students on campus who used stimulants illicitly, and in response to question 14, 22.3% (n=85) of participants agreed that they believe that stimulants are used illicitly on their campus.

Attitudes and Experiences of Students Who Had Illicitly Used Stimulants

The means and standard deviations for the second section of questions are presented in Table 2. This table includes the responses only of participants who reported having used prescribed stimulant medication illicitly on question 25. Frequencies of participants who either agreed or strongly agreed to the following statements are discussed in this section. For these questions, students were responding relative to their own experiences with stimulants.

A one-way ANOVA was employed to determine whether there was a significant difference between males and females on any of the Likert questions in Table 2. Only one significant sex difference ($p<.05$) was obtained and is noted by an asterisk in Table 2. There was a significant difference found between males (M=2.60, SD=1.28) and females (M=1.91, SD=.97) on question 10 ("I take stimulants with alcohol.").

Participants were asked about related activities in which they used stimulant medication illicitly. In response to question 8, 27% (n=14) of participants agreed that they took stimulant medication during finals week. Approximately 12% (n=6) of participants agreed that they took stimulants when they partied (question 9), and 15.4% (n=8) of participants agreed that they took stimulants before tests (question 12). Participants were also asked how and where they took stimulant medication. Sixty-nine percent (n=32) of participants agreed that they preferred to take stimulants orally (question 5), and 11.5% (n=6) agreed that they preferred to snort stimulants (question 6). When participants were asked about the use of multiple drugs, 15.4% (n=8) of participants agreed that they took stimulants with alcohol (question 10), and 21.2% (n=11) of participants agreed that they took stimulants with other drugs (question 11).

One question of particular interest related to participants' perceptions of whether stimulants helped them achieve in their classes, and possible reasons why they used stimulants was question 19, ("Stimulant medication has a positive effect on academic achievement in the long run for me."). Only 14% (n=7) of participants agreed that prescribed stimulant medication had a positive effect on their academic achievement in the long run. Four of the seven students who reported positive long-term achievement effects also had prescriptions for the stimulants.

Data were analyzed with regard to the effects that stimulants had on participants. The largest mean for these questions approached the "tend to agree" range but were all in the neutral range with means over three but less than 3.5. The largest mean was question 27, ("Stimulants make me feel more energetic.") (M=3.46, SD=1.21). The next largest mean was found on question 32, ("After the stimulant wears off I feel tired.") (M=3.17, SD=1.18), followed by question 20, ("I take stimulants to stay alert.") (M=3.15, SD=1.18), and question 21, ("I take stimulants so I don't feel tired.") (M=3.10, SD=1.11).

Predicting Factors Related to Illicit Use

A stepwise multiple regression procedure was employed to determine factors that predicted illicit use of prescribed stimulant medication on the part of the participants. For males a significant multiple R (R=.517, F (3,169) =20.57, p<.001) was obtained. The questions that predicted illicit use (question 25) were questions 11, 13 and 20 in the first section of questions ("I know students who I can get stimulants from," "Stimulants are as easy to get as marijuana," and, "I know students who use stimulants during finals week."). Two predictors were determined for females using the same procedure. A significant multiple R (R=.504, F (2,192) =32.71, p<.001) was obtained, with the significant predictors being questions 10 and 20 ("I have been offered stimulants by another student," and "I know students who use stimulants during finals week.").

Discussion

Results of the current study are of particular importance in light of the prodigious increase in the use of stimulant medication to treat children with ADHD. There has been nearly a 60-fold increase in amphetamine production for the treatment of ADHD since 1993 and a 12 fold increase in methylphenidate production since 1990, therefore the potential for illicit use of stimulant medication has increased significantly. The increased use of stimulant treatment that began with elementary students[2] in the early 1990's may currently be impacting college aged students.

Current Issues Related to the Illicit Use of Stimulants

The results of the current study are similar to the results of the study conducted by Babcock and Byrne[12], although their study focused on the recreational use of methylphenidate. They found that more than 16% of the students surveyed had tried methylphenidate recreationally, compared to 14% of the participants in the current study who agreed that they had used stimulant medication illicitly. Babcock and Byrne[12] also reported that 53.4% of the students surveyed knew students who had taken methylphenidate recreationally, and 31.4% believed that methylphenidate was a drug of abuse on their campus. In the current study, 43.8% of participants agreed that they knew students on campus who used

stimulants (methylphenidate and amphetamines) illicitly, and 22.3% of participants agreed that stimulants were a *drug of abuse on* their campus. Both the current study and the Babcock and Byrne[12] study found the illicit use of stimulants to be a significant issue on their respective campuses.

A somewhat higher percentage of students at the eastern liberal arts college knew students who used methylphenidate illicitly and were more aware of the illicit use of stimulants on their campus. Amphetamines (Dexedrine and Adderall) were not considered in their study. A possible reason for this discrepancy between the two studies may be an increased use of stimulant medication by students who attended eastern prep schools. In a qualitative study of prep school stimulant abuse, Hall[15] interviewed New England prep school students. One student, who did not abuse stimulants, summed up his experience at the prep school with the following comment,

> It's just a normal thing around here; it always has been in prep schools. They all love it [stimulants] so much, everyone wants to get their hands on it, especially during finals week, it's crazy. There is so much at this school; mostly everybody has done it. I had a buddy who went through a couple hundred milligrams of Adderall, a lot of pills, in a week. People often sell them to younger kids…Our school is hard and parents think their kids need it, so they get their kids prescribed and the abuse goes on from there (pp14-15).

The second student, who abused stimulants, offered similar insights as evidenced by the following quote,

> I think these drugs are the most over prescribed drugs in the U.S. If I wanted to go to the doctor at my school and spazz out for a half an hour and act like I needed a prescription, believe me I could get one. They are especially huge here and at other boarding schools. I use them to study, either by blowing [snorting], or orally. I prefer blowing because it helps me study better and stay awake all night. It's like an immediate boost, you just feel the intensity of concentration, but kids also use it for partying (pp14-15).

The qualitative summaries presented above may be more extreme than the empirical results obtained in the current study. However, 17% of males and 11% of females agreed that they had used prescribed stimulants illicitly in the current study. This is certainly not a trivial proportion of the student population.

Rate of Illicit Use and Sex Differences

Along with significant sex differences regarding frequency of abuse, there was also a significant difference between males and females regarding their awareness of the symptoms of ADHD, with females more aware of the symptoms of ADHD and females feeling more time pressures from school, work and family. Males were significantly more likely to know students from whom they could get stimulants. Currently, more males are using stimulants illicitly however, females are feeling more pressured by time commitments, and this pressure may serve as an impetus for using stimulants illicitly in the future.

General Attitudes Related to the Use of Stimulants

Participants in the current study felt that too many children were diagnosed with ADHD. This is consistent with the Frankenberger, Farmer, Parker, and Cermak[16] survey of school psychologists. However, in a similar study classroom teachers were less likely to agree that too many students received stimulant medication, and were more neutral in their responses[17].

Although there were some sex discrepancies, both males and females agreed that they felt pressured by time commitments, and that sleepiness and fatigue made it difficult for them to study. This combination of not getting enough sleep and feeling pressured by academic and social demands, may lead college students to seek other forms of energy boosters and study aids. With students having a motive for using stimulant medications, accessibility to stimulants becomes an important issue. Thirty-seven percent of males and 29% of females knew students from whom they could get stimulant medication. Additionally, nearly half (44%) of the surveyed college students were aware of the illicit

use of stimulant medication and reported that they knew students who took used stimulants illicitly. As the rates of stimulant production and the use of stimulant medication to treat ADHD increases, more stimulant medication will likely become available on college campuses.

Attitudes and Experiences of Students Who Had Illicitly Used Stimulants

Specific data were collected for those participants who reported using stimulant medication illicitly. Of these students, 26.9% agreed that they used stimulants illicitly during finals week, 12% used stimulants illicitly when they partied, and 15.4% used stimulants illicitly before tests. There appears to be a clear relationship between the illicit use of stimulants and academics, as well as a relationship between the illicit use of stimulant medication and recreational use.

Regarding routes of administration, students more frequently took stimulants orally (69%), with a small percentage preferring to take stimulants intranasally (11.5%). About twenty-three percent of participants took stimulants in their residence halls. Approximately 15% agreed that they took stimulants illicitly with alcohol, and 21.2% agreed that they took stimulants illicitly with other drugs. These latter factors play into the possible dangers associated with the illicit use of stimulants, especially the dangers of concomitant use with other drugs.

Stimulant medications are intended to improve academic performance although studies have not shown long-term academic benefit resulting from their use. Moline and Frankenberger's[9] study of middle and high-school students revealed that the students in their sample who were taking medication for ADHD did not perceive their medication as having a large academic impact. This finding is consistent with the results of Frankenberger and Cannon's[18] investigation of the long-term effects of stimulant medication on children with ADHD. Schachar, Jadad, Gauld, Boyle, Booker, Snider, Kim, and Cunningham[19] also reported in a review of the literature regarding long term treatment of ADHD that little evidence has shown that stimulants improve academic attainment, even after a year of treatment. In the current study, stimulants were reportedly used to promote alertness and increase

energy level. Interestingly, only 14% of the participants agreed that stimulant use had a positive effect on their academic achievement in the long run. Similarly, in the Moline and Frankenberger[9] study, middle and high school students reported that the greatest measure of stimulant effectiveness, from their perspective, was that their teachers and parents liked them more when they took their medication, not that it aided them in their academic achievement.

Predicting Factors Related to Illicit Use

A multiple regression analysis was employed to investigate factors that predicted illicit use. The factors that predicted illicit use on the part of the males were accessibility issues such as knowing where to get stimulant medication, and reporting that stimulants were as easy to get as marijuana. As for the females, the main predictor was whether they had been offered stimulant medication by another student. A predictor for both sexes was knowing students who used stimulants illicitly (used stimulants during final exam week).

Implications

Results of the current study suggest important implications. First, stimulant medications are being used illicitly on college campuses and that illicit use is likely to increase and may already be approaching that of cocaine and marijuana. Large numbers of elementary aged children were diagnosed and treated for ADHD during the 1990's and these students are currently entering colleges and may be bringing medications with them.

Second, it seems that students tended to illicitly use stimulant medications because they felt pressured by time commitments, and because they were tired and they believed stimulants would keep them alert while they studied. Interestingly, they did not believe that stimulants helped them on tests, or more generally with academics. However, students need to be aware that even though they feel more alert and energetic after taking stimulants, Frankenberger and Cannon[18] reported that concomitant long-term academic achievement gains were not observed in their longitudinal study. They posited that

stimulant medication disrupted total sleep in general, and REM sleep in particular, as an explanation for their negative findings related to stimulant treatment and academic achievement.

Third, more females are likely to use medications illicitly as stimulants become more readily available, and they offer an easy method of dealing with pressures and commitments that seem to be major stressors in their daily lives. Females were especially likely to try the drugs when they were offered them by other students.

Limitations

The researchers did not get a high enough male response rate from the initial survey that was sent to randomly selected students from residence halls. To increase the number of male participants the researchers went to residence halls and personally disseminated surveys to male students. Statistical analysis was employed of the data, specifically t-tests, to ensure the comparability of our male samples. Only two questions were discovered to be significantly different where one statistical difference would have been expected by chance. One of the significant questions was whether the students used stimulant medication illicitly. Means on this question, for males surveyed in the dorms, was significantly higher than those who returned surveys by mail. It may be concluded that those surveyed in the dorms were in fact a more representative sample due to the fact that more males in the direct sample group responded than those males who were sampled via the mail. Almost every male participated when surveyed by direct contact in the dorms, while informed consent and anonymity were enforced. The high level of participation by the direct sampling of males in the dorms probably resulted in a more representative sample than the self selected sample obtained in the initial mailing. The more representative direct sample of males was also much larger than the mailed survey sample ($n = 139$ vs. $n = 40$) and males in the direct sample group reported illicit use of stimulants at a higher rate than the mailed survey sample. Therefore, the combination of the two groups probably resulted in an illicit use rate for males that may be somewhat less than the actual rate.

It may not be possible to generalize the findings of the current study to colleges or universities in other regions of the country, or to other types of institutions. There may be an increased level of the illicit use of stimulant medication in the eastern states as reported by Babcock and Byrne[12] who discovered a higher level of illicit use compared to the findings of the current Midwestern study. Kube et al.[6] reported geographic variation in stimulant use, with school aged children living in the south and Midwest being more likely than those living in the western region of the USA to have a diagnosis of ADHD and concomitant treatment with stimulant medication. Future research is needed to investigate and assess the regional differences of the illicit use of stimulant medication by college students.

Table 1
Survey Questions With Means and Standard Deviations

Question	n	M	SD

1. I am aware of the symptoms of ADHD.	381	3.49*	1.08
2. I feel that too many children are diagnosed with ADHD.	378	3.54	.96
3. I feel that too many college students are diagnosed with ADHD.	380	2.97	.74
4. I feel pressured by my time commitments (e.g. school, work, extracurricular activities, family).	381	3.90*	1.01
5. I get enough sleep so I do not feel fatigued during the day.	379	2.71	1.13
6. Sleepiness and fatigue make it difficult for me to study.	380	3.51	1.08
7. I have trouble paying attention in class.	381	2.96	1.02
8. I have trouble paying attention when I am studying.	377	3.17	1.07
9. I know students on campus who take stimulants for non-medical purposes.	381	2.95	1.26
10. I have been offered stimulants by another student.	380	2.21	1.27
11. I know students who I can get stimulants from.	380	2.52*	1.39
12. Stimulants are as easy to get as alcohol.	381	2.70	1.10
13. Stimulants are as easy to get as marijuana.	381	2.78	1.08
14. I believe that stimulants are abused on this campus.	381	2.87	.95
15. I know students who use stimulants in dorm rooms.	379	2.54	1.19
16. I know students who use stimulants at parties.	380	2.64	1.20
17. I know students who use stimulants with other drugs.	380	2.57	1.18
18. I know students who use stimulants with alcohol.	380	2.63	1.21
19. I know students who use stimulants for studying.	379	2.70	1.22
20. I know students who use stimulants during finals week.	380	2.68	1.21
21. I know students who use stimulants before or during tests.	379	2.48	1.11
22. I know students who snort stimulants.	380	2.17	1.07
23. I know students who take stimulants orally for non-medical purposes.	379	2.58	1.23
24. I notice changes in those using stimulant drugs.	377	2.71	1.03
25. I have taken stimulants for non-medical purposes.	379	1.82*	1.13

* signifies a significant difference between males and females at the .05 level

Table 2

Survey Questions With Means and Standard Deviations for those who have used stimulants for non-medical purposes.

Question	n	M	SD

1. I take stimulants for non-medical purposes daily.	52	1.88	.96
2. I take stimulants for non-medical purposes weekly.	52	1.94	1.14
3. I take stimulants for non-medical purposes monthly.	52	2.54	1.38
4. I rarely take stimulants for non-medical purposes.	51	3.84	.92
5. I prefer to take stimulants orally.	52	3.63	1.09
6. I prefer to snort stimulants.	51	2.00	1.15
7. I think that snorting affects the body more quickly.	52	3.44	.96
8. I take stimulants during finals week.	52	2.50	1.36
9. I take stimulants while I party.	52	2.19	1.16
10. I take stimulants with alcohol.	52	2.31*	1.20
11. I take stimulants with other drugs.	52	2.27	1.27
12. I take stimulants before tests.	52	2.19	1.21
13. I take stimulants in class.	52	2.06	1.18
14. I take stimulants in my dorm room.	52	2.40	1.40
15. I take stimulants in the morning.	52	2.40	1.27
16. I take stimulants at night.	52	2.33	1.25
17. I take stimulants on weekdays.	52	2.63	1.36
18. I take stimulants on weekends.	52	2.69	1.34
19. Stimulant medication has a positive effect on academic achievement in the long run for me.	49	2.63	1.11
20. I take stimulants to stay alert.	52	3.15	1.18
21. I take stimulants so I don't feel tired.	52	3.10	1.11
22. I take stimulants to pay better attention in class.	52	2.38	1.16
23. I take stimulants to concentrate while studying.	52	2.67	1.25
24. I take stimulants to help me socialize better.	52	2.13	.93
25. Stimulants help me do better work for classes.	52	2.50	1.09

Table 2
Survey Questions With Means and Standard Deviations for those who have used stimulants for non-medical purposes (continued)

Question	n	M	SD

26. Stimulants help me perform better on tests.	52	2.52	1.09
27. Stimulants make me feel more energetic.	52	3.46	1.21
28. Stimulants make me feel better about myself.	52	2.33	1.00
29. The effects of stimulants wear off in a short period of time.	52	2.88	1.00
30. After the stimulant wears off I feel better.	52	2.37	.95
31. After the stimulant wears off I feel worse.	52	2.90	1.05
32. After the stimulant wears off I feel tired.	52	3.17	1.18
33. After the stimulant wears off I feel depressed.	52	2.44	.92
34. I feel the same after the stimulant wears off.	51	2.86	1.15
35. After taking stimulants, I need to take other medications to help me sleep.	52	2.19	1.01
36. I need to take more stimulants to have the same effect on my body after extended use.	52	2.46	1.07
37. I have experienced frequent headaches from the use of stimulants.	52	2.23	1.04
38. I have experienced loss of appetite from the use of stimulants.	52	2.77	1.32
39. I have experienced frequent stomachaches from the use of stimulants.	52	2.12	.94
40. I have developed tics from the use of stimulants.	52	1.87	.86
41. I have experienced sleep problems from the use of stimulants.	52	2.63	1.25
42. I am aware that stimulant use may cause headaches.	52	3.52	.96
43. I am aware that stimulant use may cause stomachaches.	52	3.44	1.06
44. I am aware that stimulant use may cause sleep problems.	52	3.81	.97
45. I am aware that stimulant use may cause loss of appetite.	52	3.56	1.07
46. I am aware that stimulant use may cause tics.	52	2.98	1.16
47. I am aware that stimulant use may cause a decreased physical growth rate in children.	51	3.02	1.22
48. I am aware that the long-term side effects of stimulant use are unknown.	52	3.37	1.05

Table 2
Survey Questions With Means and Standard Deviations for those who have used stimulants for non-medical purposes (continued)

Question	n	M	SD

49. I have given stimulants away.	52	2.25	1.22
50. I have sold stimulants to other students.	52	1.87	1.01
51. I have purchased stimulants from other students.	52	2.06	1.19
52. I have been given stimulants by other students.	52	2.81	1.40

* signifies a significant difference between males and females at the .05 level

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