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Adolescents' Motivations to Abuse Prescription Medications

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Abstract

OBJECTIVES—Our goals were to (1) determine adolescents' motivations (reasons) for engaging in the nonmedical (illicit) use of 4 classes of prescription medications and (2) examine whether motivations were associated with a higher risk for substance abuse problems.

RESPONDENTS—The 2005 sample (*N* = 1086) was derived from one ethnically diverse school district in southeastern Michigan and included 7th- through 12th-grade students.

METHODS—Data were collected by using a self-administered, Web-based survey that included questions about drug use and the motivations to engage in nonmedical use of prescription medication.

RESULTS—Twelve percent of the respondents had engaged in nonmedical use of opioid pain medications in the past year: 3% for sleeping, 2% as a sedative and/or for anxiety, and 2% as stimulants. The reasons for engaging in the nonmedical use of prescription medications varied by drug classification. For opioid analgesics, when the number of motives increased, so too did the likelihood of a positive Drug Abuse Screening Test score. For every additional motive endorsed, the Drug Abuse Screening Test increased by a factor of 1.8. Two groups of students were compared (at-risk versus self-treatment); those who endorsed multiple motivations for nonmedical use of opioids (at-risk group) were significantly more likely to have elevated Drug Abuse Screening Test scores when compared with those who were in the self-treatment group. Those in the at-risk group also were significantly more likely to engage in marijuana and alcohol use.

CONCLUSION—The findings from this exploratory study warrant additional research because several motivations for the nonmedical use of prescription medications seem associated with a greater likelihood of substance abuse problems.

Keywords

nonmedical prescription drug use; adolescents' prescription medication abuse

According to the National Survey on Drug Use and Health 2004 data, [1] ~9% of adolescents aged 12 to 17 years used prescription drugs for nonmedical purposes in the past year, including 7% who used pain medication, 2% stimulant medication, 2% tranquilizers, and 0.5% sedatives; however, the motivations to abuse these prescription drugs were not assessed. In fact, despite

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ample evidence that the nonmedical use of prescription medications is increasing in the United States, little research exists on adolescents' motivations for this form of drug use.

BACKGROUND

Daniel et al[2] found gender differences in their sample of 9- to 18-year-olds who took a mail survey (764 girls and 804 boys). Their study was based on data from 2 questions: “Have you ever shared your prescription medication with others?” and “Have you ever borrowed prescription medication from another?” and a follow-up question that provided 14 reasons for borrowing or sharing prescription drugs. They sought to determine how often children and adolescents share prescription medications. Approximately 20% of the girls and 13% of the boys reported borrowing and/or sharing prescribed medications in their lifetimes, a statistically significant gender difference. Of the girls, 16% reported borrowing prescription drugs from others, and 15% reported sharing their prescriptions; notably, 7% of the girls aged 15 through 18 years had shared medications >3 times. Respondents did not indicate what drugs were being borrowed or shared; therefore, it was difficult to determine if respondents were talking about acne soap or psychotropic medications.

In an exploratory study of 1017 middle and high school students attending school in 2003, researchers asked nonmedical users of prescription pain medication to provide a reason for their abuse of these medications.[3] Twenty-two percent of the girls and 10% of the boys reported lifetime nonmedical use of pain medications. Thirty-four percent of the students received diverted pain medications from family members, and the reasons offered were often to relieve pain for problems such as migraines and menstrual cramps. In a study of asthma-inhaler abuse, Boyd et al[4] found that students who misused their prescription asthma inhalers were more likely to smoke cigarettes and marijuana, as well as more likely to drink alcohol and abuse illicit drugs. Unlike with opioid analgesics, there were no gender differences in prescription asthma-inhaler misuse, indicating that gender differences may vary by drug classification.

Teter et al[5] examined the motives to abuse prescription stimulants in a random sample of 9161 undergraduate college students, 8% of whom had used prescription stimulants nonmedically in their lifetimes. Using the Student Life Survey,[6] a Web-based survey, these researchers asked students (n = 689) to endorse their reasons for abusing prescription stimulants. The most prevalent motivations were to (1) help with concentration, (2) increase alertness, and (3) provide a high; motivations did not vary by gender. To determine why students were abusing prescription stimulants, Hall et al[7] studied 370 undergraduates and found no gender differences in motivations; 13% indicated that they had taken stimulants that were not prescribed to them. Twenty-seven percent of the students reported taking the drugs during finals week, 15% before tests, and 12% when they partied. Four of the 10 students who had been prescribed stimulants also indicated that they used them nonmedically.

Particularly relevant are the trends in medical prescription rates and the increase in prescription medications.[8] Several studies have reported recent increases in US prescription rates of abusable medications including psychotropic,[9] stimulant,[10-13] and opioid analgesics.[14] Between 1992 and 2002, opioid prescriptions increased by 222%, benzodiazepines by 49%, and stimulants by 368%.[8] Empirical evidence, albeit limited, suggests that an increase in the medical use of prescription medications will lead to increases in misuse and/or the non-medical use of these drugs.[15,16]

Poulin,[17] in fact, found that nonmedical use of stimulants was directly correlated to the number of prescription users in a student's school class or grade level. In a self-report study of 13 549 Canadian students, Poulin reported that of the 7th-, 9th-, 10th-, and 12th-graders who were prescribed stimulants, ~15% reported giving away their medications. Seven percent reported

selling their stimulant medications, 4.3% experienced theft, and 3% were forced to give someone their medications.[17]

METHODS

The purpose for this 2005 exploratory study was to examine the motives reported by 1086 youth between the ages of 12 and 18 years from a community in southeastern Michigan. We aimed to determine the reasons for abusing 4 classes of scheduled prescription medications: sleep aids, sedatives/anxiolytic agents, stimulants, and opioid analgesics. We also aimed to determine if the types of motivations were associated with a higher risk for other substance abuse problems as indicated by the 10-item Drug Abuse Screening Test (DAST-10).

A Web-based random-sample survey was conducted in the school setting with 7th- through 12th-grade students. After receiving human subject review board approval and a certificate of confidentiality, we sent consent forms to the parents of all students in 7th to 12th grades. The public school district required that all parents complete and return a consent form (active consent) before the student was allowed to participate; 73% of the students returned a consent form and were allowed to participate. Of these eligible students, 94% took the survey. The final response rate for this Web-based survey was based on the American Association for Public Opinion Research guidelines (RR2)[18]; thus, our response rate was 68% for the 2005 data collection.

The survey was conducted over the Internet in computer laboratories with hooded computers; when students arrived at the laboratory, research assistants greeted their class and provided each student with a sheet of paper with a preassigned personal identification number (PIN). Students were told to sit at a computer terminal and sign on to the Web survey using their unique PIN. Two research assistants supervised each of the 4 computer laboratories. The first page of the survey provided a brief description of the study, an informed consent box, and basic instructions. The survey took ~22 minutes to complete. The Web survey was maintained on a hosted, secure Internet site running under the secure sockets layer (SSL) protocol. Unique PINs were preassigned to 1086 students to allow them to confidentially access the Web survey.

Sample

In May 2005, we studied 7th- through 12th-graders who attended schools in a public school district in the Detroit, Michigan, metropolitan area. Our sample included 54% boys and 46% girls; 52% of the respondents were white, 45% were black, and 3% were from other racial groups. Approximately 18% of the students were in 7th grade, 18% in 8th grade, 23% in 9th grade, 16% in 10th grade, 12% in 11th grade, and 12% in 12th grade. This public school district was an ideal study site because it provided a racially diverse sample of students.

Definitions

One problem with existing research pertaining to prescription drug abuse (or the nonmedical use of prescription medications) is that the terms “use,” “misuse,” and “abuse” are used in particularized ways depending on the authors' disciplines. In this article, the following definitions are presumed: “Nonmedical use,” “prescription drug abuse,” or “illicit use” of prescription medications (drugs) is defined as the use of prescription medication to create an altered state, to “get high,” or for reasons (or by people) other than those (or for whom) intended by the prescribing clinician. In contrast, “medical misuse” (or noncompliant use) of prescription medication involves the use of a prescribed medication by a person (and for the purpose) intended by the prescribing clinician; however, in the case of misuse (unlike medical use), the medication is not used in the prescribed dose and/or is not taken within a prescribed time interval.

Measurements

Nonmedical use of prescription medication was assessed by asking about the occasions the nonprescribed medications were used. Lifetime and 12-month use was assessed, and there were separate questions for each of the following prescription drugs analyzed here: (*a*) sleeping medication (eg, Ambien, Halcion, Restoril, etc); (*b*) sedative/anxiety medication (eg, Ativan, Xanax, Valium, Klonopin, etc); (*c*) stimulant medication (eg, Ritalin, Dex edrine, Adderall, Concerta, etc); and (*d*) pain medication (eg, Vicodin, OxyContin, Tylenol 3 with codeine, etc). Respondents could endorse "never" or "don't know/rather not say" or endorse the affirmative with the number of occasions.

Medical use of prescription medication was assessed by asking, "Based on a health professional's prescription, on how many occasions in your lifetime (and past 12 months) have you used the following types of drugs?" Respondents had similar response categories as indicated above (for nonmedical use).

Motivations to engage in nonmedical prescription medication abuse were assessed by asking youth to provide the reasons why they used each prescription medication nonmedically. Respondents were given a list of motivations and were asked to check all that applied (see Figs 1-4 for the items). If respondents only endorsed the motivation that is consistent with the drug's pharmaceutical indication, they were characterized as demonstrating self-treatment motivations. If they endorsed other motivations, they were characterized as demonstrating at-risk motivations.

Alcohol and marijuana use was assessed by asking about alcohol and drug use through a series of questions used in a national study of 8th-, 10th-, and 12th-grade students.[19] Measures of lifetime, past-year, and past-month alcohol and other drug use were used. Moreover, a gender-sensitive measure of binge drinking was included to measure the frequency of at least one binge-drinking episode (ie, at least 4 drinks in one sitting for girls and at least 5 drinks in one sitting for boys) within the past 2 weeks.

Risk of substance abuse was assessed with a modified version of the DAST-10, a self-report instrument that can be used in nonclinical settings to screen for potential abuse and dependence to various drugs other than alcohol (eg, all illegal drugs and prescription medication abuse).[20] Originally modified from the Michigan Alcohol Screening Test, the DAST-10 has acceptable internally consistency (Cronbach's $\alpha = .86$) and test-retest reliability of .70.[21]

For this study, using Web-based skip logic, students who admitted to the use of drugs received the DAST-10. Because the first question on the DAST-10 pertains to drug use without medical reasons, it was assumed to be endorsed by this subsample of nonmedical prescription drug–using respondents. It is for this reason that we made the cutoff higher for a positive DAST-10 score. If a student positively endorsed ≥3 DAST-10 items, we considered it a "positive" score, denoting a moderate level of risk for substance abuse.[21]

Data Analysis

Data analysis included 1086 respondents, and all statistical analyses were conducted by using SPSS 14.0 (SPSS Inc, Chicago, IL). To determine the prevalence rates, the number of students reporting the behavior was divided by the total number of students responding to the question. To determine if the motivation to engage in the nonmedical use of prescription medication predicted a positive DAST-10 score, we created a motives index for each of the 4 drug classes; this index was treated as a correlate of a positive DAST-10 score. We used the DAST-10 as a dichotomous variable, using the 3-plus endorsement as the cutoff for a positive score; <3 was considered to be a negative score. Finally, because opioid analgesics were the most likely prescription medication to be used, we focused on students who reported this form of drug use.

We created 2 groups: a self-treatment group, defined as students who only used opioid analgesics nonmedically to relieve pain; and an at-risk group, defined as students who used opioid analgesics for other reasons as well.

RESULTS

Twelve percent of the students engaged in the nonmedical use of opioid pain medications in the previous 12 months; 3% of the students had nonmedically used sleeping medications, 2% sedatives/anxiolytic agents, and 2% stimulants. There were no gender differences in these prevalence rates with the exception of that for pain medications; girls were significantly more likely to non-medically use opioid analgesics ($\chi^2 = 9.9$; degrees of freedom [*df*] = 1; $P < .01$). There were also no gender differences in motivations with one exception: boys were more likely to report being addicted (as a reason for nonmedical use) for 3 of the 4 drug classes. However, the subsample numbers were small, and this finding should be interpreted cautiously.

As expected, motivations varied by drug classification. Some of the motives endorsed by our respondents were consistent with the diagnostic indications for the respective medications. For instance, 75% of the students who nonmedically used sleeping medications (in the previous 12 months) did so for help sleeping, and that was their sole reason. However, students' motives to nonmedically use pain medications were more diverse than for sleeping medications. Although 69% used them solely for pain control and 79% endorsed pain relief as at least one motivation, other motives were endorsed. In addition, 11% endorsed using these medications to get high. This was not as true for stimulants: 29% endorsed only one motive to use stimulants (that is, to help with concentration or alertness), and 21% endorsed either 2 or 3 motivations, the most frequently mentioned of which were because it gives a high, to help concentrate, and to increase alertness. As with sleeping and stimulant medications, very few students had used sedative/anxiolytic medications nonmedically in the previous 12 months. The most frequently cited motivations for their use were to help with sleep, to decrease anxiety, and to get high.

Of the 338 respondents who admitted to any lifetime drug use, 20% answered “no” when asked: “In the past 12 months, are you always able to stop using drugs when you want to?” We also found evidence that the nonmedical use of prescription medications is associated with an increase in general substance abuse problems, particularly with the opioid analgesics.

For opioid analgesics, when the number of motives increased, so too did the likelihood of a positive DAST-10 score. For every additional motive endorsed, the odds of a positive score on the DAST-10 increased by a factor of 1.8. With logistic regression, our analysis indicated that the pain use-motive index still predicted higher odds of a positive score on the DAST-10 even when age, gender, and race were statistically controlled (adjusted odds ratio: 1.8; 95% confidence interval: 1.2–2.6). Although the subsamples for the other medications were too small to run multivariate analyses, we assessed whether those with a positive score on the DAST-10 reported more of each type of motive.

Two groups of nonmedical prescription opioid users were compared: those who self-medicated for pain ($n = 86$) and those who endorsed other reasons for nonmedical use ($n = 41$). Results showed that scores on the DAST-10 were significantly higher in the at-risk group (mean: 3.90) compared with the self-treatment group (mean: 1.67) ($t_{125} = 6.3$; $P < .01$). Analyses also indicated that past-year frequency of marijuana use was significantly higher in the at-risk group (mean: 4.03) compared with the self-treatment group (mean: 2.90) ($t_{63} = 2.1$; $P < .05$). This group difference was also observed for alcohol abuse; alcohol use (lifetime, past year, and past month) was higher in the at-risk group (eg, past year use: at-risk group mean: 3.82 versus self-treatment group mean: 2.75 [$t_{117} = 3.1$; $P < .01$]). The maximum number of drinks in a 2-hour period in the past year was significantly higher in the at-risk group (mean: 5.15) compared with that in the self-treatment group (mean: 2.84) ($t_{114} = 2.5$; $P < .05$).

When the total DAST-10 scores were compared, there were no significant gender differences. However, there was one item on the DAST-10 that revealed a gender difference: boys were more likely to have engaged in illicit activity to obtain drugs than girls ($\chi^2 = 5$; $df = 2$; $P = .02$). Unfortunately, because the subsamples were small for the other 3 drug classes, we were unable to run multivariate analyses for the sleeping, sedative/anxiolytic, and stimulant medications.

DISCUSSION

It was noted earlier that ~9% of US youth aged 12 to 17 reported the nonmedical use of prescription medications in 2004, with 7% reporting the nonmedical use of opioid analgesics.[1] The overall prevalence in our 2005 sample was much higher; in fact, the nonmedical use of prescription medication was 14%, with 12% reporting the nonmedical use of opioid analgesics. The differences between the national data and our prevalence rates could be related to several design factors: The study populations were clearly different. Our sample came from one ethnically diverse public school district in which the entire 7th through 12th grades were invited to participate. Our study is contrasted with studies that used national, stratified random sampling of 8th-, 10th-, and 12th-graders[19] or household surveys[1] in which either paper-and-pencil questionnaires or computer-assisted surveys were administered. School-based surveys and Web-based approaches to data collection have produced higher estimates of drug use than household surveys, which may be a factor in the discrepancy here.[22]

Respondents often endorsed reasons for nonmedical use that were consistent with the therapeutic indications for each drug class. For instance, 79% of the respondents endorsed pain relief for the nonmedical use of pain medications, 69% endorsed “helps with sleep” for the nonmedical use of sleeping medications, and 46% endorsed “decreasing anxiety” as a reason to take sedatives/anxiolytic agents. Thus, respondents admitted to self-treating their pain, sleep, and anxiety problems. The nonmedical use of stimulant medications was a bit different; students were just as likely to endorse “to get high” or “experimentation” as they were to endorse to “help with concentration” or “increase my alertness.”

Our previous studies of nonmedical opioid and asthma-inhaler use demonstrated the relationship between nonmedical prescription drug use and other forms of substance abuse among adolescents[3,4]; this study lends support to our earlier findings by examining the risk of substance abuse problems associated with nonmedical prescription drug use. Although endorsing only one motivation for nonmedical use was not necessarily associated with an elevated DAST-10 score, every additional motivation carried a greater likelihood of scoring higher on the DAST-10. The greater the number of motivations (endorsed by individual respondents), the more likely they were to be at risk for substance abuse/dependence problems. However, there may be at least 2 distinct groups of nonmedical prescription medication users: those who self-medicate and those who use for other reasons, including to experiment and get high. The latter group seems to be at greater risk for other forms of substance abuse. It is also possible that some nonmedical users are attempting to enhance their performance; the nonmedical use of prescription medications for the purpose of enhancing performance needs additional study as well.

The nonmedical use of prescription medications may be a form of drug use that challenges traditional ideas about adolescent substance abusers. If future research supports the conceptualization of separate groups (differentiated by their motivations to use), then substance abuse–prevention programs may have to reconsider their approaches when addressing the nonmedical use of prescription medications. In fact, the preponderance of self-treating reasons endorsed by our sample may explain why effective and well-studied programs such as Life Skills[23] are not effective in reducing the nonmedical use of prescription medications.

Compton and Volkow,[24] in their commentary on opioid analgesics, hypothesize that prescription opioid analgesics are abused because of modeling by family members and social networks. Correspondingly, in a review by the National Center on Addiction and Substance Abuse,[7] it was noted that "friendly sharing" is commonplace among family members and friends. Our worry is that this behavior sends the message that self-treating is normative and safe, a message that is reinforced by the ever-present marketing of prescription medications.

The nonmedical use of prescription drugs clearly signifies an increasing health problem among US youth, and this increase should impart a sense of urgency.[1,3,4,24-27] We believe that the findings from this exploratory study warrant additional research, particularly because motivations for the nonmedical use of prescription medications seem associated with a greater likelihood of substance abuse problems. However, this was an exploratory study of students from 1 community, and generalizations are constrained. The study relied on self-report and, thus, may have resulted in underestimates; students who are consistently absent from school are known to have higher rates of illicit substance use.[19] Finally, this study relied on survey data collected for a larger study; thus, the items in the original questionnaire present some limitations. For instance, we did not ask about the quantity and frequency of the prescribed medications, nor did we ask students about their medical diagnoses; this information would have provided perspective on the motivations.

Future research is needed to determine if friendly sharing among family and friends poses a risk for developing substance abuse problems and to further evaluate which nonmedical prescription drug users are at greatest risk for developing further substance abuse problems. Most certainly, we must better understand the reasons for nonmedical use if we are to prevent prescription drug abuse from becoming an epidemic.[27]

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Abbreviations

DAST-10, Drug Abuse Screening Test; PIN, personal identification number; df, degrees of freedom.

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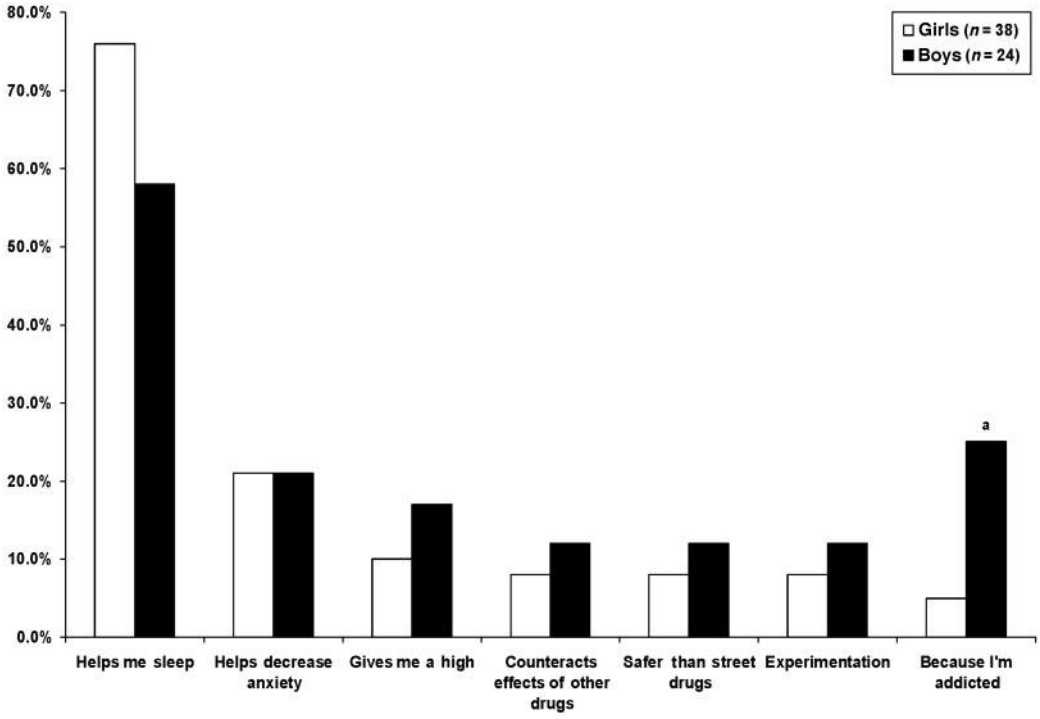

FIGURE 1.

Reasons for nonmedical use of prescription sleeping medication according to gender (n = 62 lifetime nonmedical sleeping medication users).[a] $P < .05$.

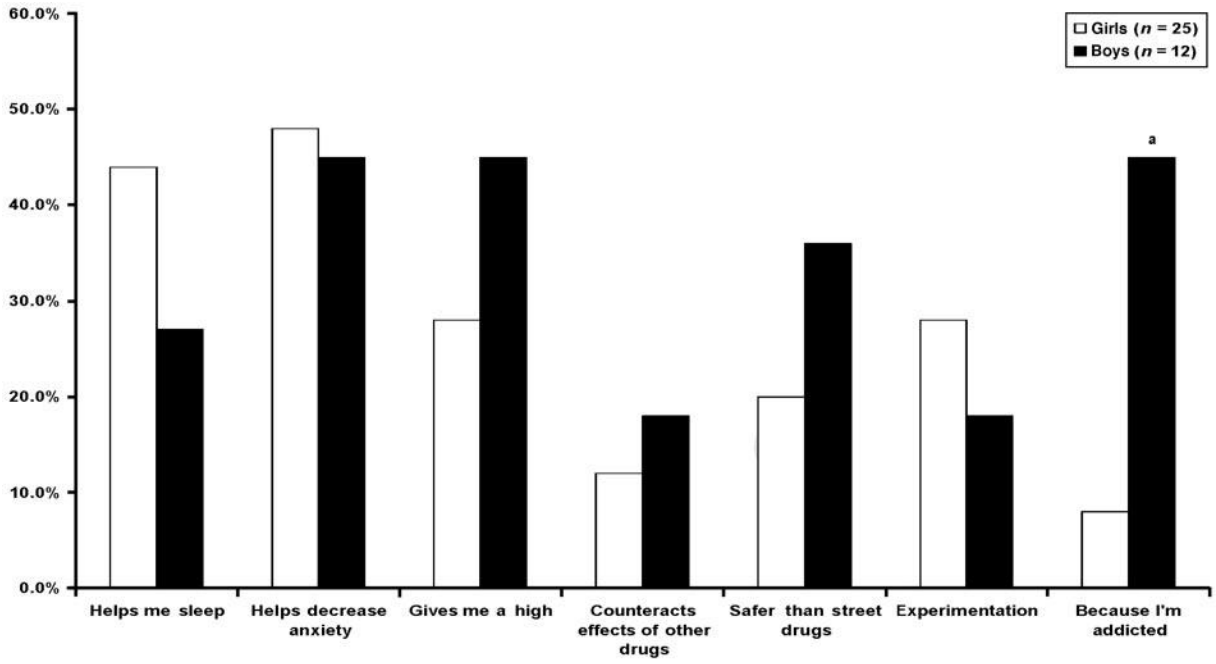

FIGURE 2.

Reasons for nonmedical use of prescription sedative/anxiolytic medication according to gender (n = 37 lifetime nonmedical sedative/anxiolytic users).[a] $P < .05$.

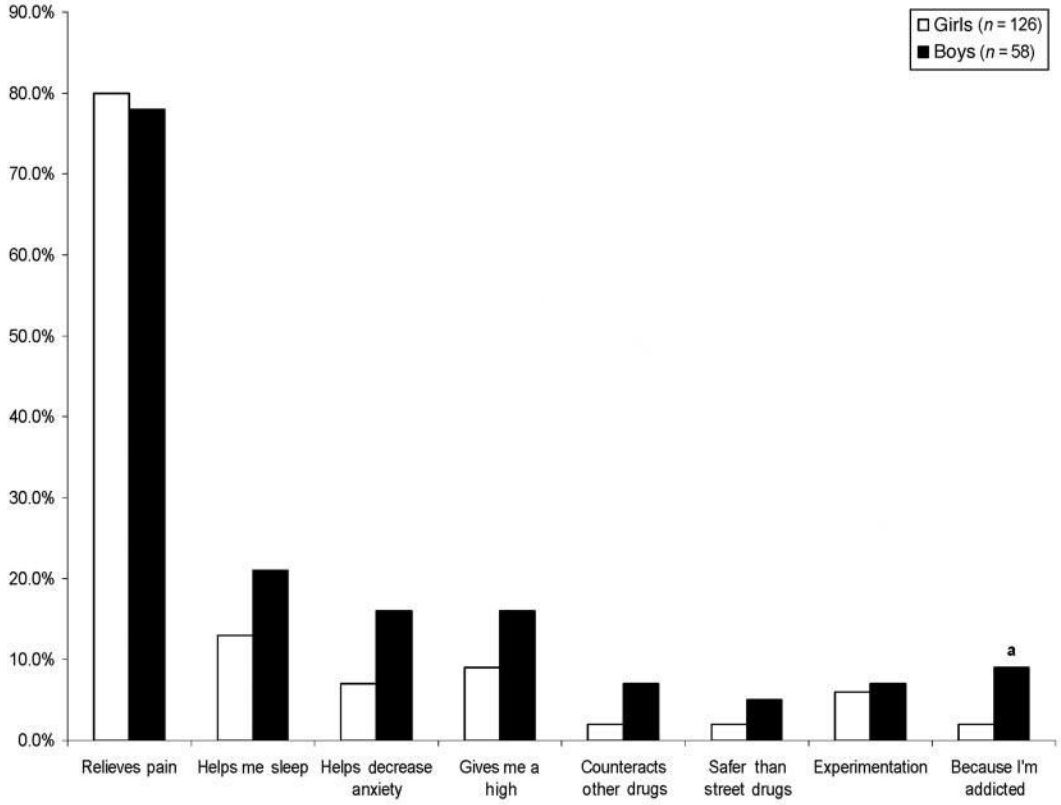

FIGURE 3.
Reasons for nonmedical use of prescription pain medications according to gender (n = 184 lifetime nonmedical pain medication users).[a] $P < .05$.

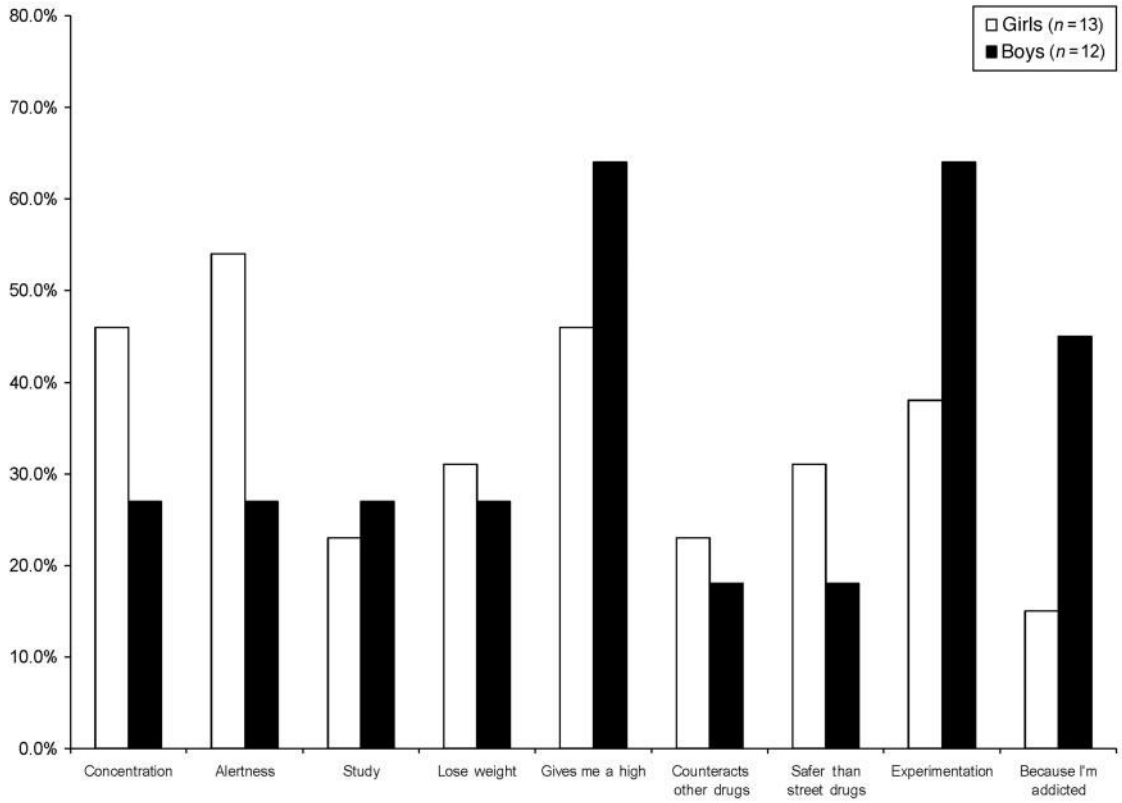

FIGURE 4.

Reasons for nonmedical use of prescription stimulant medications according to gender (n = 25 lifetime nonmedical stimulant medication users).

TABLE 1

Past-Year Prevalence of Medical and Nonmedical Prescription Medication Use

Characteristics (N = 1086[a])	Sleeping Medication		Sedative/Anxiety Medication		Stimulant Medication for ADHD		Pain Medication	
	Medical Use, *n* (%)	NMPD Use, *n* (%)	Medical Use, *n* (%)	NMPD Use, *n* (%)	Medical Use, *n* (%)	NMPD Use, *n* (%)	Medical Use, *n* (%)	NMPD Use, *n* (%)
Overall	91 (9)	36 (3)	35 (3)	17 (2)	36 (3)	18 (2)	346 (33)	126 (12)
Gender								
Female (n = 586)	59 (10)	21 (4)	23 (4)	10 (2)	13 (2)	10 (2)	235 (42)	85 (15)
Male (n = 498)	32 (7)	15 (3)	12 (2)	7 (1)	23 (5)	8 (1)	110 (23)	41 (9)
Ethnicity								
Black (n = 484)	36 (8)	11 (2)	9 (2)	4 (1)	9 (2)	4 (1)	159 (35)	63 (14)
White (n = 565)	54 (10)	22 (4)	24 (4)	12 (2)	25 (5)	13 (2)	175 (32)	59 (11)
Other (n = 37)	1 (3)	3 (9)	2 (6)	1 (3)	2 (6)	1 (3)	11 (33)	4 (12)

NMPD indicates nonmedical prescription medication; ADHD, attention-deficit/hyperactivity disorder.

[a] There were 2 cases with missing data on gender and race/ethnicity. Because of the missing data, the denominator for the overall prevalence rates was not always 1086.

TABLE 2

Self-treatment Group Compared to At-Risk Group Using DAST-10 Scores

Drug Classification	*N*	Mean	*df*	*P* (2-Tailed)
Sleep aids				
Self-treatment (0–2 drug use problems on DAST-10)	24	1.2	44	.06
At risk (≥3 drug use problems on DAST-10)	22	2.1		
Sedatives/anxiolytic agents				
Self-treatment (0–2 drug use problems on DAST-10)	12	1.3	27	.109
At risk (≥3 drug use problems on DAST-10)	17	2.6		
Pain relievers				
Self-treatment (0–2 drug use problems on DAST-10)	90	1.1	138	.000
At risk (≥3 drug use problems on DAST-10)	50	2.0		
Stimulants				
Self-treatment (0–2 drug use problems on DAST-10)	5	2.6	21	.611
At risk (≥3 drug use problems on DAST-10)	18	3.3		

TABLE 3

DAST-10 Responses (N = 338)

In the Past 12 mo:	Yes, %	No, %
Have you ever used drugs other than those required for medical reasons?	42	58
Have you used more than one drug at a time?	19	81
Are you always able to stop using drugs when you want?	80	20
Have you had blackouts or flashbacks as a result of drug use?	10	90
Have you ever felt bad or guilty about your drug use?	28	72
Have family members ever complained about your involvement with drugs?	26	85
Have you stayed away from your family because of your use of drugs?	10	90
Have you engaged in illegal activities in order to obtain drugs?	14	86
Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	10	90
Have you had medical problems as a result of your drug use (eg, memory loss, convulsions, bleeding?)	8	92