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Discordant Reporting of Nonmedical Opioid Use in a Nationally Representative Sample of US High School Seniors

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Abstract

Background—Nonmedical opioid use has become a major public health concern due to increases in treatment admissions, overdoses, and deaths. Use has also been linked to heroin initiation. Reliable data on nonmedical opioid use is needed to continue to inform prevention.

Objective—To determine the prevalence and correlates of discordant self-reports of nonmedical use of opioids in a national sample.

Methods—Utilizing a nationally representative sample of 31,149 American high school seniors in the Monitoring the Future study (2009–2013), discordant responses between self-reported 12-month nonmedical opioid use and self-reported 12-month nonmedical Vicodin and OxyContin use (reporting Vicodin/OxyContin use, but not reporting “opioid” use) were assessed. We also determined characteristics of students who were most likely to provide a discordant response.

Results—37.1% of those reporting nonmedical Vicodin use and 28.2% of those reporting nonmedical OxyContin use did not report overall nonmedical opioid use. Prevalence of nonmedical opioid use (8.3%) would increase when factoring in Vicodin, OxyContin, or both, by 2.8%, 1.3%, and 3.3%, respectively. Females were more likely to provide a discordant response for Vicodin and highly religious students were more likely to provide a discordant response regarding OxyContin use. Those who reported cocaine or nonmedical tranquilizer use were at consistently low odds for discordant responses. Nonmedical amphetamine users were at low odds for providing a discordant Vicodin response.

Conclusion—Prevalence of nonmedical opioid use may be underreported on some surveys, particularly among specific subpopulations. Further research on the affect of question order and skip-patterns (e.g., “gate” questions) is needed.

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Keywords

opioids; reliability of self-report; adolescents; oxycodone

INTRODUCTION

Nonmedical use of prescription opioids (a.k.a.: narcotics, analgesics, pain-killers) among adolescents in the United States (US) is high, with 9.5% of high school seniors reporting lifetime use in 2014 (1). Every day, an estimated 1,300 adolescents initiated nonmedical opioid use for the first time in 2014, with an average age of initiation of 21.6 years (2). The US experienced a 183% increase in emergency department visits related to nonmedical opioid use between 2004 and 2011 (3), an 8% increase in opioid related admissions to substance abuse treatment centers between 2002 and 2012 (4), and increases in opioid-related overdose deaths between 1999 and 2011 (5). According to the Centers for Disease Control and Prevention (CDC), opioids are associated with nearly 75% of prescription medication overdoses in the US (6). In addition, frequent nonmedical opioid use is associated with increased risk for heroin initiation (7).

Of prescription opioids commonly used in a nonmedical manner, Vicodin (hydrocodone plus acetaminophen) and OxyContin (oxycodone) are of particular concern, considering the high frequency with which they are prescribed and used. According to the National Survey on Drug Use and Health (NSDUH), Vicodin appears to be the most prevalent opioid used in a nonmedical manner in the US, used by an estimated 14.2% of adults age 18–25 in 2013 (8). While nonmedical OxyContin use is less prevalent (used by an estimated 5.4% of adults age 18–25) in the US compared to Vicodin and other opioid formulations such as Percoset (8), nonmedical OxyContin use is particularly prevalent among opioid dependent individuals (9–11). OxyContin is known for its high potency (12,13) although its abuse appears to have been somewhat curtailed since introduction of abuse-deterrent formulations in 2010 (14). Data collected from Monitoring the Future (MTF), a nationally representative survey of high school seniors in the US, asks students about nonmedical use of Vicodin and OxyContin within the last 12 months, and in 2014, 4.8% of students reported Vicodin use and 3.3% of students reported nonmedical OxyContin use (1).

Many drug surveys ask respondents about nonmedical use of opioids as a general class of drugs (often including examples of drugs in that category). However, few surveys ask specifically about types (or brands) of opioids used. Considering the popularity and potential dangers associated with use of specific prescription opioids such as Vicodin and OxyContin, it is essential to assess the accuracy of reporting nonmedical opioid use generally as compared to reporting use of specific types of opioid drugs. Self-report of illicit drug use compared to urinalysis typically produces good validity findings (15–19); however, specific prescription opioids used in a nonmedical manner (e.g., Vicodin, OxyContin) may be viewed differently by users as they are commonly prescribed (e.g., government approved, pharmaceutical grade pills) and thus different from other “street” drugs. Furthermore, underreporting of nonmedical opioid use has been found to be common in some populations (e.g., among pregnant women, those who are dependent, veterans, adolescents) (20–25), but

underreporting may also be due, in part, to confusion regarding which drugs are opioids, or in regard to medical versus nonmedical/recreational use. A study assessing validity of using a self-report questionnaire compared to self-report via identification of specific opioids from color photographs found that validity was higher for OxyContin, but lower for generic extended-release oxycodone (κ = 0.62 and 0.46, respectively) when compared to some other opioids, such as methadone wafers/disks, methadone tablets, or Dilaudid (9), suggesting that reporting of use of individual types of opioids may not always be reliable.

Of concern is that most data on validity of drug use self-report has been conducted in groups of individuals in drug treatment programs, rather than in general population samples. A study on the validity of drug use self-reports in MTF found that lifetime use of most illicit drugs remained consistent in the sample even after re-query of respondents on seven different occasions, indicating validity of drug use self-report (26). However, consistency in responses was lower for psychotherapeutic (prescription) drugs, although this study did not specifically examine validity for opioid use (26). The authors suggest that discordance of reporting of psychotherapeutic drugs may be due to ambiguity in drug definitions (e.g., a student may have difficulty categorizing Xanax as a benzodiazepine). A major limitation of paper and pencil surveys such as MTF (27) is that complex branching of questions (or “skip patterns”) are often too difficult to utilize as they may confuse the participant (28), and thus all students are asked every question, regardless of previous responses about use of specific types of drugs.

In this analysis we seek to describe differences in self-reporting of nonmedical opioid use among high school seniors assessed in the annual MTF survey, who were asked about both general nonmedical opioid use and also specifically about nonmedical Vicodin and OxyContin use. We examine and compare prevalence of self-reported nonmedical opioid use overall with prevalence of self-reported nonmedical use of Vicodin and OxyContin—questions that are asked of all students regardless of responses to the general nonmedical opioid use questions. As nonmedical opioid use has become a major public health issue in the US, results will help determine whether students may be under- or over-reporting use of specific opioids, potentially due to confusion regarding definitions.

METHODS

Procedure

MTF is a nationally representative cross-sectional study of high school students in the US. About 15,000 12^{th} graders (high school seniors) are surveyed every year from approximately 130 public and private schools throughout the 48 coterminous states. A multi-stage random sampling procedure is utilized: geographic areas are first selected, then schools within areas are selected, and then classes within schools are selected. Since two of the main variables of interest (nonmedical Vicodin and OxyContin use; discussed below) were only assessed in half of the sample (via three out of six survey forms), in order to have adequate power, this analysis focused on aggregated data collected from the five most recent cohorts with available data (2009–2013). MTF protocols were approved by the University of Michigan Institutional Review Board (IRB) and the authors’ IRB deemed this secondary data analysis exempt from review.

Drug Use

Before students were asked about last-year (12-month) nonmedical use of opioids, the survey explained that, **"**There are a number of narcotics other than heroin, such as methadone, opium, morphine, codeine, Demerol, Vicodin, OxyContin, and Percocet. These are sometimes prescribed by doctors." They were then asked, "On how many occasions (if any) have you taken narcotics other than heroin on your own—that is, without a doctor telling you to take them—during the last 12 months?" Answer options were use on 1) 0 occasions, 2) 1–2 occasions, 3) 3–5 occasions, 4) 6–9 occasions, 5) 10–19 occasions, 6) 20–39 occasions, and 7) 40 or more occasions. Later on in the survey, students were asked additional questions about 12-month nonmedical Vicodin and OxyContin use, and all students were asked, regardless of their response to the first opioid item. Specifically, students were asked, "During the last 12 months, on how many occasions (if any) have you taken Vicodin (without a doctor's orders)?" and in a separate question they were given the same item, but with regard to "OxyContin (without a doctor's orders)." We dichotomized each of the three items into 12-month use: yes/no, and created variables indicating whether there was discordance in reporting (e.g., a discordance by which they reported Vicodin use, but not opioids). We could not examine lifetime use as MTF did not ask about lifetime Vicodin or OxyContin use. However, we did consider lifetime use of other drugs assessed as covariates: alcohol, marijuana (cannabis), cocaine, and nonmedical use of amphetamine and tranquilizers.

Sociodemographic Variables

Students were asked their sex, age (predefined by MTF as <18, ≥18 years) and race/ethnicity (i.e., black, white, Hispanic). Level of religiosity was assessed via two ordinal items which asked about level of religious attendance and importance. A composite was computed and divided into tertiles to indicate low (1.0–2.0), moderate (2.5–3.0) and high (3.5–4.0) religiosity. Students were also asked how many nights they typically go out per week for fun and we coded answers into 1) 0–1, 2) 2–3, and 4) 4–7. Coding and justification of entry of variables were based on previous MTF analyses as these covariates are commonly related to use of various drugs—including nonmedical opioid use (7,29–31). Thus, we examined common correlates from MTF that may allow us to delineate discordant responses and we hypothesized that those at higher risk for other drug use would be less likely to provide a discordant response due to possible experience, exposure, or knowledge of drugs.

Analyses

Analyses focused on students with complete opioid use data (Weighted $N = 31,149$). We first examined descriptive statistics for all variables. Next we produced cross-tabulations to examine self-reported nonmedical use of Vicodin and OxyContin by self-reported nonmedical use of opioids as a general category. Among students reporting nonmedical use of Vicodin/OxyContin, we computed the prevalence of not reporting nonmedical use of opioids in general, overall and by each covariate aforementioned. Logistic regression models were also used to generate unadjusted odds ratios (ORs) and adjusted ORs (AORs) for each covariate to determine which students were most likely to report discordant responses (e.g., reported Vicodin use but not opioid use as the outcome variable as per the variable

indicating whether or not the response was discordant). For unadjusted (bivariable) analyses we implemented a Bonferroni statistical correction to account for multiple testing ($\alpha = .05/10 = .005$). All analyses were design-based for survey data (32) and sample weights were included in all analyses. SAS 9.3 software (SAS Institute, 2011) was used for all analyses.

RESULTS

Sample characteristics and self-reported drug use are presented in Table 1. With regarding to recent (12-month) nonmedical opioid use, 8.3% reported any use; 7.6% reported nonmedical Vicodin use and 4.4% reported nonmedical OxyContin use. Most students who did not report nonmedical use of opioids also did not report nonmedical use of Vicodin (96.9%) and OxyContin (98.6%). As shown in Table 2, among those reporting nonmedical Vicodin use, 37.1% did not report nonmedical use of opioids in general and among those reporting nonmedical use of OxyContin, 28.2% did not report nonmedical opioid use in general (relative percentages). With regard to absolute percentages, the estimated prevalence of nonmedical opioid use if we include discordant reports of Vicodin use would increase from 8.3% to 11.1% (95% CI: 10.7, 11.5; 8.3% + 2.8% [absolute difference when including Vicodin]). Including OxyContin would increase the estimate from 8.3% to 9.6% (95% CI: 9.2, 9.9; 8.3% + 1.3% [absolute difference when including OxyContin]). Including discordant responses for both Vicodin and OxyContin would increase the estimated prevalence from 8.3% to 11.6% (95% CI: 11.2, 12.0; 8.3% + 3.3% [absolute difference when including Vicodin and OxyContin]).

We then examined whether demographic characteristics and drug use were related to reporting nonmedical use of Vicodin or OxyContin, but not reporting general nonmedical opioid use (discordant reporting). As shown in Table 3, females were more likely to report a discordance regarding Vicodin (AOR = 1.34, $p = 0.013$). Compared to white students, black and Hispanic students were at high odds for reporting Vicodin use without controlling for other covariates, but these associations were no longer significant upon controlling for all other covariates. Likewise, religious students were more likely to report use of Vicodin, but not general opioid use, but significance was lost when controlling for all other covariates. Students who said they go out for fun 4–7 nights per week for fun (compared to those who said they go out 0–1 nights per week for fun) were at reduced odds for reporting use of Vicodin, but not general opioid use, but this, too, lost significance when controlling for all other covariates. Alcohol and marijuana use were associated with decreased odds of reporting this discordance and significance was lost when controlling for all other covariates; however, cocaine use, and nonmedical use of amphetamine and tranquilizers were all consistently and robustly associated with decreased odds of reporting this discordance with regard to Vicodin.

With regard to students reporting OxyContin use, but not use of opioids (Table 4), compared to white students, black and Hispanic students were at increased odds for reporting the OxyContin discordance, but significance disappeared when controlling for all other variables. Moderate and high religiosity were associated with high odds for reporting this discordance although strength of associations weakened when controlling for all other covariates. Going out 4–7 nights per week for fun was also significant until controlling for

all other variables. Alcohol use and nonmedical amphetamine use were associated with decreased odds for use until controlling for all other covariates. Cocaine use and nonmedical tranquilizer use were consistently and robustly associated with decreased odds of reporting this discordance.

DISCUSSION

Since nonmedical opioid users in the US take specific drugs such as Vicodin or OxyContin, it is essential that survey-takers and tools designed to assess the prevalence of opioid use do not misclassify use of specific drugs with regard to this drug category. Accurate prevalence of use is needed to inform prevention, as underestimations of prevalence may lead to less public health concern. In this analysis of data from MTF, a nationally representative sample of American high school seniors, we found 8.3% of high school seniors reported nonmedical use of opioids within the last 12 months, with 7.6% reporting Vicodin use and 4.4% reporting OxyContin use within the same time period. Relative percentages of students who reported nonmedical use of Vicodin or OxyContin but did not report nonmedical use of opioids (as a general category) were high, at 37.1% and 28.2%, respectively. Thus, about a third of students who reported nonmedical use of Vicodin or OxyContin reported no nonmedical opioid use. This suggests prevalence of self-reported nonmedical opioid use (as a general drug category) is being underestimated (by up to 3.3%). Our analyses of the characteristics of students who provided discordant responses may give some insight into why these individuals reported nonmedical use of specific opioids, but not of nonmedical use of opioids in general.

Black and Hispanic students were both more likely to provide discordant responses than white students in bivariable models, but not in multivariable models. This adds to earlier findings by Johnston and O'Malley (26), who found racial and ethnic minorities, and in particular African-American students, were more likely to provide discordant reports of drug use in an MTF validation study. Similarly, a reliability study of the NSDUH found white individuals were more likely to consistently report substance use (33). In general, whites reportedly use opioids nonmedically more frequently than other racial/ethnic subgroups (34), whites are more likely to be prescribed opioid drugs for pain than other racial/ethnic groups (35), and they are also more likely to "doctor shop" for pills (36). Thus, white students may in fact be more familiar with and/or knowledgeable about specific types of opioid drugs such as Vicodin and OxyContin, and therefore less likely to provide discordant responses. However, we found that confounding factors such as other drug use appear to weaken such significant associations.

Religiosity was also associated with increased odds of discordant reporting. Religiosity has previously been shown to be associated with decreased risk of drug use (37, 38) and decreased approval of drug use (39), as well as increased disapproval and stigma toward drug users (40, 41). It may be that individuals who are both highly religious and have used are thus less likely to accurately self-report drug use due to fear of disapproval, or perhaps they are more likely to lack the knowledge that these controlled pills can in fact be drugs of abuse when used outside of prescribed purposes.

Reporting lifetime use of alcohol and some other illicit drugs examined were associated with decreased odds of discordance between reporting nonmedical Vicodin or OxyContin use and general nonmedical opioid use—although some associations diminished when controlling for all other covariates. We hypothesize two pathways to explain this finding: 1) individuals who use licit and illicit drugs at greater rates may perceive less social disapproval of drug use, and therefore be less subject to reporting bias; and moreover, 2) individuals who use licit and/or illicit drugs at greater rates may be more knowledgeable about drugs and drug classes and therefore less subject to information bias. Previous studies have shown individuals who use drugs perceive less disapproval in regard to use of that drug (40, 42), and use of other "hard" drugs (39), and therefore these individuals may be likely to self-report drug use more accurately because of less perception of disapproval. Furthermore, individuals who report use of other licit and illicit drugs may be more knowledgeable about drugs (43, 44), and therefore be less likely to report a discordance due to information bias. In addition, self-reported use of other psychoactive drugs which are legal when used as prescribed—amphetamine (e.g., Adderall) and tranquilizers (e.g., Xanax, Valium)—were consistent and robust predictors of not providing a discordant response. It may be that students who use amphetamines and/or tranquilizers in a nonmedical manner are more familiar with and/or knowledgeable about pills they use in other categories such as opioids.

Another factor previously shown to be associated with discordant drug use reporting is initiation of opioid use for pain management (21). Individuals who started using opioids to treat pain may be more familiar with drug names, and may be more likely to report use of specific drugs, while not reporting use of opioids generally; however, research is needed to confirm this. One study found over a third (36.9%) of adolescents access opioids through their own leftover prescriptions, and these individuals primarily use to reduce physical pain (45). As the source of many opioids used non-medically for adolescents are often their own prescriptions, and thus these individuals are primarily likely to use opioids to reduce pain, a substantial percentage of the adolescent population may also be more likely to discordantly report drug use.

Although many surveys today are electronic and ask follow-up questions via skip-patterns and piping methodology, results from MTF (which is administered via paper and pencil) provided us with a unique opportunity to examine concordant versus discordant responses. While discordant responses are in fact problematic, electronic surveys generally do not allow discordant responses. For example, respondents may be asked a "gate" question about nonmedical use of specific opioids. If the individual responds that no opioid was used in a nonmedical manner then they are taken to questions about a different drug, with no opportunity to later provide a discordant (but accurate) response. Likewise, if a respondent accidentally checks off "no" to a group a drugs earlier on (even though all drugs of interest were listed), the opportunity is then lost for further questions related to those listed drugs. NSDUH (8) respondents are asked "gate" questions about nonmedical use of specific opioids; however, they are also shown a card depicting photographs of different opioid pills and lists of opioid names to help them identify opioids they have used nonmedically. The card depicts and/or lists 21 different opioids including Vicodin, Percoset, and OxyContin. However, few electronic surveys depict photographs of specific drugs. While branching,

piping, and skip patterns are beneficial with regard to electronic surveys, research is needed to determine whether such technology may lead to underreporting.

Limitations

MTF was not able to assess those who dropped out of high school and this can affect the generalizability of findings. Public MTF data are cross-sectional so we were unable to examine patterns of self-report over time. While MTF asks about lifetime, 12-month and 30-day nonmedical use of opioids, it only asks about 12-month nonmedical use of Vicodin and OxyContin, so analyses had to be limited to last-year use. MTF also only asks about Vicodin and OxyContin via three (of six) survey forms, so we could only examine data for half of the national sample. We also had no way to determine whether discordant self-reported use of Vicodin or OxyContin were reporting errors. While adding more specific questions to a survey may likely result in better data, surveys were not complemented with interviews or biological testing.

Missing data was also an issue. Of those with missing data for the overall nonmedical opioid use variable (4.3%, $n = 1,539$), 32.2% ($n = 496$) had Vicodin data (1.6% of those with opioid data) that had to be omitted from analyses. Of those with missing data for the overall nonmedical opioid use variable, 32.8% ($n = 505$) had OxyContin data (1.6% of those with opioid data). While percentages of missing data were relatively small, we discovered a systematic difference in prevalence when comparing prevalence of Vicodin and OxyContin use according to who also had general nonmedical opioid use data (the analytic sample) and who did not have data for all three opioid variables (excluded from analyses). Specifically, those excluded due to missing opioid data reported significantly higher prevalence ($ps < 0.001$) of Vicodin (15.9%, 95% CI: 12.5, 19.3) and OxyContin (12.3%, 95% CI: 9.2, 15.4) use. Therefore, an important bias appears to have been discovered in which many students who reported use of Vicodin or OxyContin were likely to skip the earlier question about overall nonmedical opioid use. We also found significantly different levels of missingness for Vicodin and OxyContin across survey forms ($ps < .001$) (but not general nonmedical opioid use); however, patterns of missingness are similar (across forms) for self-reported 12-month use of other drugs assessed by MTF along with Vicodin and OxyContin: cough medicines, synthetic cannabinoids, ketamine, andro, creatine, Ritalin, and Adderall (all $ps < 0.001$).

Conclusions

In this analysis of a nationally representative sample of American high school seniors we found discordance in reporting of nonmedical opioid use by specific type of opioid (i.e., Vicodin, OxyContin) and general nonmedical use of opioids. These findings suggest overall estimates of opioid use may be underestimated in some studies, and future tests of validity may be required to ensure respondents recognize and provide appropriate responses for use of the drugs assessed.

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TABLE 1

Sample characteristics ($N = 31,149$).

Variable	*Weighted N*	%
Sex		
Male	14,861	47.7
Female	15,562	50.0
Missing	726	2.3
Age, years		
< 18 Years	13,282	42.6
≥ 18 Years	17,804	57.2
Missing	63	0.2
Race		
White	18,971	60.9
Black	3,206	10.3
Hispanic	4,562	14.6
Missing	4,409	14.2
Religiosity		
Low	9,582	30.8
Moderate	6,646	21.3
High	7,547	24.2
Missing	7,373	23.7
Evenings Out Per Week for Fun		
0–1	8,688	27.9
2–3	15,135	48.6
4–7	6,890	22.1
Missing	436	1.4
12-Month Nonmedical Opioid Use		
Opioids (General Category)	2,585	8.3
Vicodin	2,365	7.6

Variable	*Weighted N*	%
OxyContin	1,381	4.4
Lifetime Use of Other Drugs		
Alcohol	20,710	69.2
Marijuana	13,388	43.7
Cocaine	1,593	5.1
Amphetamine (Nonmedical)	3,527	11.4
Tranquilizers (Nonmedical)	2,784	9.0

Note. There were no missing data for opioid use as analyses focused on students with complete opioid data. Percentages for lifetime drug use represent those who reported use. Percentages for those missing data were omitted.

TABLE 2

Self-reported nonmedical use of Vicodin and OxyContin compared with self-reported general nonmedical opioid use.

	Opioids (+)	Opioids (−)		Opioids (+)	Opioids (−)
Vicodin (+)	62.9% (95% CI: 60.6, 65.2) (*n* = 1,487)	37.1% (95% CI: 34.8, 39.4) (*n* = 878)	Oxycontin (+)	71.8% (95% CI: 68.9, 74.6) (*n* = 991)	28.2% (95% CI: 25.4, 31.1) (*n* = 390)
Vicodin (−)	3.8% (95% CI: 3.6, 4.1) (*n* = 1,098)	96.2% (95% CI: 95.9, 96.4) (*n* = 27,685)	Oxycontin (−)	5.4% (95% CI: 5.1, 5.7) (*n* = 1,594)	94.6% (95% CI: 94.3, 94.9) (*n* = 28,173)
	n = 2,585	*n* = 28,563		*n* = 2,585	*n* = 28,563

Note. CI = confidence interval. The percentages above are row percentages, which compare self-reported opioid use within Vicodin and OxyContin use. We do not present column percentages (of Vicodin and OxyContin use) within opioid use as it is unknown which specific opioid(s) the student used; thus, we were unable to determine whether responses were discordant.

TABLE 3

Prevalence of reporting use of Vicodin, but not opioid use.

	Prevalence % (95% CI)	OR	95% CI	AOR	95% CI
Overall Prevalence	37.1 (34.8, 39.4)	--	--	--	--
Sex					
Male	34.5 (31.5, 37.5)	1.00		1.00	
Female	39.6 (36.1, 43.2)	1.24†	(1.02, 1.52)	1.34*	(1.06, 1.69)
Age, years					
<18	35.5 (31.7, 38.8)	1.00		1.00	
≥18	38.3 (35.4, 41.3)	1.14	(0.94, 1.39)	1.11	(0.89, 1.40)
Race					
White	33.5 (30.9, 36.2)	1.00		1.00	
Black	58.0 (48.1, 67.8)	2.73***	(1.80, 4.17)	1.35	(0.82, 2.23)
Hispanic	45.9 (39.0, 52.8)	1.68***	(1.24, 2.28)	1.33	(0.94, 1.90)
Religiosity					
Low	31.1 (27.6, 34.6)	1.00		1.00	
Moderate	41.2 (35.7, 46.6)	1.55**	(1.17, 2.04)	1.36	(0.99, 1.87)
High	48.3 (41.4, 55.3)	2.07***	(1.50, 2.85)	1.36	(0.93, 1.98)
Evenings Out Per Week for Fun					
0–1	43.9 (38.0, 49.7)	1.00		1.00	
2–3	39.4 (35.9, 42.9)	0.83	(0.63, 1.10)	1.00	(0.73, 1.22)
4–7	30.4 (27.0, 33.9)	0.56***	(0.42, 0.75)	0.87	(0.63, 1.22)
Lifetime Alcohol Use					
No	63.3 (53.2, 73.4)	1.00		1.00	
Yes	34.2 (31.8, 36.5)	0.30***	(0.19, 0.47)	0.62	(0.37, 1.04)
Lifetime Marijuana Use					
No	60.8 (54.2, 67.3)	1.00		1.00	
Yes	32.8 (30.4, 35.2)	0.32***	(0.23, 0.42)	0.81	(0.56, 1.16)

	Prevalence % (95% CI)	OR	95% CI	AOR	95% CI
Lifetime Cocaine Use					
No	43.5 (40.7, 46.3)	1.00		1.00	
Yes	21.4 (17.8, 24.9)	0.35***	(0.28, 0.45)	0.67**	(0.50, 0.89)
Lifetime Amphetamine Use (Nonmedical)					
No	51.2 (47.8, 54.7)	1.00		1.00	
Yes	23.4 (20.6, 26.1)	0.29***	(0.24, 0.36)	0.51***	(0.40, 0.66)
Lifetime Tranquilizer Use (Nonmedical)					
No	51.0 (47.7, 54.3)	1.00		1.00	
Yes	22.1 (19.3, 24.9)	0.27***	(0.22, 0.34)	0.46***	(0.36, 0.59)

Note. OR = odds ratio, AOR = adjusted odds ratio, CI = confidence interval.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$,

† $p < .05$, but non-significant after Bonferroni correction ($p < .005$)

TABLE 4

Prevalence of reporting use of OxyContin, but not opioid use.

	Prevalence % (95% CI)	OR	95% CI	AOR	95% CI
Overall Prevalence	28.2 (25.4, 31.1)	--	--	--	--
Sex					
Male	28.6 (24.9, 32.4)	1.00		1.00	
Female	26.2 (21.8, 30.7)	0.89	(0.66, 1.19)	0.95	(0.67, 1.35)
Age, years					
<18	24.5 (20.2, 28.7)	1.00		1.00	
≥18	30.5 (26.7, 34.2)	1.35†	(1.01, 1.81)	1.16	(0.83, 1.63)
Race					
White	23.9 (20.5, 27.2)	1.00		1.00	
Black	47.4 (35.8, 59.0)	2.87***	(1.74, 4.73)	0.76	(0.42, 1.38)
Hispanic	37.0 (28.0, 46.0)	1.88**	(1.22, 2.88)	1.19	(0.69, 2.06)
Religiosity					
Low	21.5 (17.6, 25.3)	1.00		1.00	
Moderate	37.7 (30.6, 44.9)	2.22***	(1.52, 3.25)	1.62*	(1.04, 2.53)
High	41.8 (32.9, 50.7)	2.63***	(1.71, 4.05)	1.82*	(1.08, 3.08)
Evenings Out Per Week for Fun					
0–1	38.9 (30.9, 46.8)	1.00		1.00	
2–3	30.2 (25.7, 34.7)	0.68	(0.46, 1.01)	0.87	(0.55, 1.37)
4–7	21.0 (17.1, 24.9)	0.42***	(0.28, 0.63)	0.73	(0.45, 1.16)
Lifetime Alcohol Use					
No	61.6 (45.8, 77.3)	1.00		1.00	
Yes	24.4 (21.5, 27.3)	0.20***	(0.10, 0.40)	0.53	(0.22, 1.26)
Lifetime Marijuana Use					
No	63.4 (52.5, 75.4)	1.00		1.00	
Yes	23.2 (20.4, 26.0)	0.17***	(0.10, 0.29)	0.45*	(0.25, 0.83)

	Prevalence % (95% CI)	OR	95% CI	AOR	95% CI
Lifetime Cocaine Use					
No	37.0 (33.1, 40.9)	1.00		1.00	
Yes	13.5 (10.2, 16.9)	0.27***	(0.19, 0.37)	0.45***	(0.30, 0.67)
Lifetime Amphetamine Use (Nonmedical)					
No	40.6 (35.6, 45.5)	1.00		1.00	
Yes	19.9 (16.5, 23.2)	0.36***	(0.27, 0.49)	0.95	(0.67, 1.38)
Lifetime Tranquilizer Use (Nonmedical)					
No	44.8 (40.0, 49.3)	1.00		1.00	
Yes	14.8 (11.9, 17.7)	0.21***	(0.16, 0.29)	0.35***	(0.25, 0.50)

Note. OR = odds ratio, AOR = adjusted odds ratio, CI = confidence interval.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$,

† $p < .05$, but non-significant after Bonferroni correction ($p < .005$)