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Adolescent Sexual Assault and the Medical and Nonmedical Use of Prescription Medication

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Abstract

Previous research has documented an association between sexual victimization and prescription medication use among adults. The purpose of this study was to determine whether such a relationship was present for adolescent girls when considering sexual victimization by a peer and the use of four drug classes for medical and nonmedical reasons. The study was based on a secondary analysis of a cross-sectional Web-based, self-administered survey of female students from a middle and high school (n = 490). As predicted, sexual victimization increased the likelihood of non-medical prescription medication use of opioid analgesics and sedative medication, although these relationships varied based on the severity of sexual assault. Findings are discussed in light the importance of increasing awareness among health professionals, researchers, and the wider community of the increased risk for prescription medication abuse among adolescent girls who have a history of sexual violence.

Keywords

Sexual Assault; Adolescence; Substance Use; Prescription Medications

Non-medical use of prescription medication (NUPM) among adolescents is increasing rapidly and is second only to marijuana as the most widely initiated substance among this population (SAMHSA, 2008). Despite its prevalence, little is known about the correlates, motivations, and consequences of prescription medication use among adolescents (Boyd, McCabe, Cranford, & Young, 2006; McCabe, Boyd, & Young, 2007). The well documented relationship between sexual victimization and substance abuse (most notably among women) gives us grounds for concern that female adolescent victims of sexual assault may be particularly at high risk for NUPM. While we should be concerned about the possibility of sexual victimization increasing the likelihood of adolescent substance use and abuse in general, we should be particularly concerned about victimization potentially increasing the

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risk of prescription medication use given that these drugs are widely available yet are not perceived in the general community as dangerous or addictive.

The purpose of this article is to begin to fill this void in our understanding of adolescent sexual victimization and its implications for prescription medication use and abuse by examining the relationship between these variables using a Web-based survey of middle and high school students. Drawing from a self-medication model, we propose that adolescent assault victims take prescription medications to alleviate psychological distress following assault. Given the paucity of literature and research simply documenting and describing adolescent experiences of prescription medication use and sexual victimization, we draw from the broader field of study examining adult victimization, psychological functioning, and substance misuse to guide or work.

The nonmedical use of prescription medication (NUPM), that is, using prescription medication without a doctor's order or in a manner unintended by the prescribing physician, is becoming a common form of illegal drug use among adolescents. Adolescents aged 12–17 have the second highest annual rate of prescription drug abuse after young adults (ages 18–25; SAMHSA, 2008). Although drug use among teenagers has shown signs of overall decline in the past 10 years, the nonmedical use of some prescription medications continues to rise, particularly among younger teens (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Far less NUPM research has been conducted with this younger population, though recent research shows that the non-prescribed use of OxyContin was higher than ever before among 8th graders (2.6%) and 10th graders (3.8%), suggesting that middle school and the first years of high school may be periods of increased risk for the initiation and development of NUPM (Johnston et al., 2007).

In order to fully comprehend the risks associated with NUPM, it is necessary to understand the motives for nonmedical use, as students who increase the dosage of a prescribed medication may face different consequences than students who deliver a medication in an unintended way (i.e., snorting, or injecting) or for the purposes of getting high. When divided into groups based on their motive for NUPM (self-treatment group versus recreational use group), Boyd et al. found that significantly more students in the recreational use group obtained a positive drug screen using the DAST-10, suggesting that those who engage in NUPM, but use the medication as intended, may be at lesser risk for the development of substance abuse problems than those who use for other reasons (Boyd, McCabe, Cranford, & Young, 2007). It is important to note that Boyd et al.'s study defined self-treatment as the use of prescription medication for its intended purpose, e.g., the use of pain medication to relieve pain symptoms. However, it is also possible to use medications in an attempt to "self-treat" health problems for which the drug was not originally designed. For example, an adolescent may use pain medication to alleviate migraine symptoms even though the medication was prescribed originally for pain symptoms following surgery. It is unclear whether this latter type of self-treater is distinct from the self-treaters identified in the Boyd et al. study in terms of their health risk and problem behaviors.

Based on Department of Justice statistics from the National Crime Victimization Survey (NCVS: Rennison 2002), adolescents have the highest rate of sexual assault for all age groups. Annual rates of sexual assault (for males and females) in 2001 were highest for 16–19 year olds (3.4 cases per 1000 persons), followed by 20–24 year olds (2.4 cases), 12–15 year olds (1.7 cases), and 24–29 year olds (1.1 cases; Rennison, 2002). Studies documenting the prevalence of peer-on-peer sexual victimization during adolescence among community based samples (i.e., schools) of adolescent girls indicate that such victimization is far more common than suggested by previous studies based on victim's seeking treatment, reported cases of assault, or crime reports (Snyder, 2000); indeed, 40 to 50% of adolescents report

unwanted sexual contact by peers that meets the Department of Justice's definition of sexual victimization (Maxwell, Robinson, & Post, 2003; Poitras & Lavoie, 1995; Young, Grey, Abbey, & Boyd, 2008).

Among women, the association between sexual assault and substance use, misuse, and substance use disorders (SUDs) has been well established (e.g., Miller, Downs, & Testa, 1993; Thompson, Arias, Basile, & Desai, 2002; Tjaden & Thoennes, 2000). The strength of these findings are supported by the fact that they have been found among many populations, including those seeking treatment for alcoholism and other psychiatric disorders (Miller et al., 1993) and the general population (Thompson et al., 2002; Tjaden & Thoennes, 2000). While almost all of these studies focus on alcohol or illicit drug use, the association between assault and prescription medication use has been documented in a few studies (Davis, Peck, & Storment, 1993; McCauley, Amstadter, Danielson, Ruggiero, Kilpatrick, & Resnick, 2009; Newton-Taylor, Dewit, & Gliksman, 1998; Sturza & Campbell, 2005). Based on a nationally representative sample of US adult women, McCauley et al. (2009) reported that post-traumatic stress disorder (PTSD) symptoms, other forms of substance use/abuse, and a history of drug or alcohol facilitated rape significantly increased the likelihood of NUPM. In an exploratory study, Sturza and Campbell (2005) found that 44% of rape survivors used sedatives/tranquilizers or anti-depressant prescription medication following assault; of these survivors, 14% did not obtain the drugs through a doctor's prescription and 50% obtained the drugs with a doctor's prescription but without disclosure of the assault. Furthermore, survivors in this study who disclosed assault commonly felt blamed and silenced by the physician's response of giving them a prescription for medication to alleviate symptoms following assault. These findings suggest that the difficulty associated with disclosing sexual forms of trauma, and health professionals' response to disclosure, may play a critical role in obtaining adequate care (e.g., didactic therapy by itself or in conjunction with drug therapy) for psychological distress following sexual trauma.

One of the most prominent frameworks for understanding sexual trauma and SUDs is the self medication model, which poses that psychological distress following assault prompts victims to self medicate in an attempt to minimize negative mood and post-traumatic stress disorder (PTSD) symptoms that are associated with sexual victimization (e.g., Miranda, Meyerson, Long, Marx, & Simpson, 2002). Substances that can minimize anxiety or "numb" victims to their emotional state or reoccurring memories are candidates for frequent use and misuse among assault survivors. Support for the self medication model includes research documenting that women with a history of childhood sexual assault and PTSD symptoms are more likely to have problems with alcohol than victimized women without these symptoms (Epstein, Saunders, Kilpatrick, & Resnick, 1998; Miller, Maguin, & Downs, 1997); and that assaulted women with PTSD symptoms *and* drinking problems believe that drinking can reduce distress and drink to cope with the assault's effect (Ullman, Filipas, Townsend, & Starzynski, 2006).

The purpose of the current study is to begin to fill the void in our understanding of adolescent experiences of sexual victimization and prescription medication use with a secondary data analysis of the *Secondary Student Life Survey*, a study of middle and high school students' experiences of school, health, violence, and substance use that has been described in other studies (Boyd et al., 2006, 2007). The objectives and hypotheses of the current study are modest, given that there are no known studies even documenting a relationship between sexual victimization and prescription medication use among middle and high school students. First, drawing from studies on sexual assault and substance use among adults, we hypothesize that adolescent girls who have been sexually victimized will be at increased risk for prescription medication use, particularly when considering medications that can minimize feelings of emotional distress and cognition of traumatic

memories, such as sedative/anxiolytics, opioid analgesics, and sedative medication. Second, based on research indicating limited disclosure of sexual trauma among the general population of adolescents, we hypothesize stronger associations between sexual victimization and use of prescription medications obtained without a prescription from a health care provider, in contrast to the associations between sexual victimization and the use of medications obtained with a prescription. Given that early alcohol use among adolescents is associated with NUPM (Boyd, Young, Grey, & McCabe, 2009) and sexual victimization (Kilpatrick, Acierno, Sanuders, Resnick, Best, & Schnurr, 2000), alcohol use was included in the model to control for its effects on the relationship between victimization and NUPM.

METHOD

The study was based on a secondary analysis of a cross-sectional Web-based, self-administered survey of students from a middle and high school in southeastern Michigan. In the initial study, all students (1,514) attending the two schools in 7th–12th grades during 2007 were recruited to participate; 968 students participated in the study, representing a 63.9% response rate. The purpose of the original survey was to document adolescents' experiences of school, alcohol, tobacco, illicit and prescription medication use; their academic performance; and instances of interpersonal violence. The larger study, on which this secondary analysis was based, received IRB approval and a Certificate of Confidentiality prior to beginning the study. Both active parental consent and student assent were obtained. Additional details on the survey administration procedures have been described elsewhere (Boyd et al., 2007; McCabe et al., 2007; Young et al., 2008).

Sample

The sample used for this study included the 490 adolescent females in the 7th – 12th grades who were queried about experiences of sexual victimization. On average, respondents were 14.9 years of age (SD = 1.7). The majority of respondents were either Black (52%) or White (45%); the remaining 3% included American Indian/Alaskan Native, Hispanic, and Asian American students. Approximately one third of respondents' parents had some high school or had completed high school (mothers = 31%, fathers = 37%), one fourth had attended some college (mothers = 28%, fathers = 18%), and one third had completed college or an advanced degree (mothers = 31%, fathers = 25 %).

Instruments

Respondents were asked about basic demographic information, including gender, race, age, and grade level. *Sexual victimization* by peers was measured with a modified version of the Sexual Experiences Survey (SES; Koss & Gidycz, 1985; Koss & Oros, 1982). The SES is a self-report survey instrument consisting of 10 items designed to obtain information about degrees of sexual aggression, ranging from sexual harassment through sexual acts involving physical contact, including penetration. Modifications were made to the SES to make it suitable for peer-on-peer assault among an adolescent population by reducing the number of items, simplifying the language, and specifying that respondents were to report on acts that occurred since the beginning of middle school with peers of the opposite sex and approximately the same age; this modified version of the SES has been used in previous research (Young et al., 2008a, 2008b). Aggressive acts involving physical contact were defined as sexual assault. A three category variable was created from these sexual victimization items that included no assault, non-penetrating assault (i.e., hugging, kissing, sexual touching), and penetrating/attempted penetrating assault (attempted or completed forced oral sex or rape) categories.

Prescription Medication Use

Medical use of prescription medication was measured with the following question: Based on a health professional's (e.g., doctor, dentist, nurse) prescription, on how many occasions in the past 12 months have you used the following types of drugs?: (a) Sleeping medication (e.g., Ambien, Halcion, Restoril); (b) Sedative/anxiety medication (e.g., Ativan, Xanax, Valium, Klonopin); (c) Stimulant medication (e.g., Ritalin, Dexedrine, Adderall, Concerta); (d) Pain medication (e.g., Vicodin, OxyContin, Tylenol 3 with Codeine). Response categories include: No occasions, 1–2 occasions, 3–5 occasions, 6–9 occasions, 10–19 occasions, 20–39 occasions, 40+ occasions. Respondents can endorse: "never," "don't know/rather not say," or endorse the affirmative with the number of occasions.

Non-medical Use of Prescription Medication

Non-medical use of prescription medication was assessed by asking the following question: On how many occasions in the past 12 months have you used the following types of drugs not prescribed to you? The non-medical use response options were similar to the medical use variables described above. Two variables pertaining to substance use were included in the analyses as covariates. First, *binge drinking* was assessed with the following question adapted from the *College Alcohol Study* (Weschler, Dowdall, Davenport, & Rimm, 1995): Over the past two weeks, how many occasions have you had four (five for males) or more drinks in a row? A drink is a glass of wine, bottle of beer, or shot of liquor straight or in a drink. Response options were: None (0), once (1), twice (2), 3–5 times (3), 6–9 limes (4), 10 or more times (5), "rather not say." Second, *illicit drug use* was assessed with 10 items adapted from the *Monitoring the Future* study (Johnston et al., 2009) (marijuana, cocaine, LSD, other psychedelics, crystal meth, heroin, inhalants, ecstasy, GHB, and Rohypnol®). In this study, a count of the number of illicit drugs reported for the past year was used to create an index of illicit drug use.

RESULTS

Prior to hypothesis testing, rates of prescription medication use and sexual assault victimization were examined for all 7th through 12th grade female respondents. The rate of sexual assault was high, with 38.8% (n = 190) of respondents reporting at least one sexual assault victimization experience since the beginning of middle school. The most common type of sexual assault reported was kissing, hugging, and sexual touching (35.5%, n = 174); while 3.3% (n = 16) of the respondents reported unwanted oral sex or penetrative rape. In the past year, 44.3% (n as 215) of respondents reported medical use of at least one of four classes of medications, while 15.5% (n = 75) reported non-medical use from at least one of the four classes (see Table 1 for rates of prescription medication use). Rates of medical use ranged from 2.3% (n = 11) for stimulants to 39.9% (n = 198) for prescription opioid analgesic medication. Non-medical use of prescription medications ranged from 1% (n = 5) for anxiolytics and stimulants to 14.1% (n = 68) for non-medical use of opioid analgesic medications. Although rates of prescription medication use might be expected to increase with age, this pattern was not evident. For female respondents, only medical use of anxiolytics differed by age ($\chi^2 = 7.29$, $p < .05$) with respondents aged 17 and older (6.5%, n = 7) differing from respondents 14 or younger (1.4%, n = 3).

Binary logistic regressions were conducted to predict medication use (yes/no) with sexual victimization (none, non-penetrating, penetrating/attempted penetrating). Ten separate regressions were run to predict each of the four drug classes and the "any medication" variable for both medical and non-medical use. Prior to entering the victimization variable into the equation, binge drinking and illicit drug use were entered in the initial regression step to control for any association between these variables and sexual victimization. In terms

of medical use of medications, respondents who experienced non-penetrating forms of victimization, when compared to respondents in the "no victimization" category, were approximately at two times the odds to report medical use of opioid analgesic medication and "any medication" (see Table 2). There were no significant differences between respondents who reported penetrating/attempted penetrating assault to respondents in the "no victimization" category in terms of medical use of prescription drugs.

In terms of non-medical use, both respondents experiencing non-penetrating and penetrating/attempted penetrating forms of victimization were more likely than the "no victimization" group to report non-medical prescription medication use. Respondents reporting non-penetrating forms of victimization were approximately two times the odds as the "no victimization" group to report nonmedical opioid analgesic medication use and "any medication" use. Respondents who reported penetrating/attempted penetrating forms of sexual victimization were approximately five times the odds to non-medically use opioid analgesic and sedative medications. Indeed, while 9.8% of non-victims and 18.7% of victims of non-penetrating assault reported non-medical opioid analgesic medication in the past year, 43.8% of respondents reporting penetrating/attempted penetrating forms of sexual victimization had non-medically used opioid analgesic medication in this time frame. Although the overall prevalence of non-medical use of sedative medication was lower for all three groups than the non-medical use of opioid analgesic medication, similar between-group distinctions in past year use were present.

DISCUSSION

The purpose of this study was to explore the relationship between adolescent girls' experiences of sexual victimization by peers and their use of prescription medications, when specifically focusing on the prevalence and association of such events and behaviors among the general population, and not just a subgroup of adolescents who seek treatment following assault or whose assault has been reported. Findings from this study coincide with previous research documenting the association of sexual victimization among women and prescription medication use. While previous studies have documented this relationship when considering prescription medications in general (Davis & Lee, 1996; MeCauley et al., 2009; Newton-Taylor, Dewit, & Gliksman, 1998) or anxiolytics and anti-depressant medications (Sturza & Campbell, 2005), findings from our study indicate that the association between victimization and prescription medication use is present when considering opioid analgesic and sedative medications, but is not present when considering anxiolytics and stimulants.[1] As with these previous studies, our findings coincide with a self-medication model in which sexual assault victims use prescription medication as a means of dealing with psychological distress following sexual trauma. However, the findings also coincide with a "date rape" model in which alcohol and/or drug use incapacitates the victim rendering them more vulnerable to attack. Among adolescent girls, drug-and alcohol-facilitated and incapacitated sexual assault occurs in one out of every five sexual assault victims (McCauley et al., 2009; Young et al., 2008). Thus, it is quite plausible that both the self-medication and date-rape explanations for this association are valid and that future research is needed to better understand the nature of the association.

Of particular note are our results revealing that the level of assault severity is relevant to the likelihood of non-medical and medical prescription medication use. In terms of the 3.3% respondents reporting penetrating/attempted penetrating forms of assault, such as attempted

[1]It is important to note, though, that stimulant use among respondents in this study was minimal and thus our ability to detect small differences among groups was hampered. Whether statistical differences were detected or not, the very small percentage of stimulant use among adolescent girls suggests that it is of minimal relevance in clinical or "real world" terms for this population.

or actual rape, the increased likelihood of non-medically using opioid analgesic or sedative medication was five times the odds when compared to the non-victimized group, suggesting that the degree of sexual trauma has profound implications for the small percentage of girls who experience this type of assault. While girls in this study who reported non-penetrating forms of trauma, such as kissing, hugging, and sexual touching, were "only" two times the odds to use prescription medications than non-victimized girls, a sizable group of girls (35.5%) report this type of assault at least once since the beginning of middle school. These non-penetrating forms of trauma are often perceived by our society as irrelevant or a "normative" part of adolescence (AAUW, 2001); however, such assault is clearly relevant in terms of its association with prescription medication abuse. Indeed, findings from this study suggest that one out of three of 7th–12th grade girls in the public school system have experienced this non-penetrating form of assault, and one out of eight[2] of 7th–12th grade girls have experienced such assault *and* are non-medically using opioid analgesic medications. If the term normative is used to mean "common," rather than "ideal" or "healthy," then it is correct to say that these non-penetrating forms of victimization are a normative experience for adolescent girls.

Differences in the increased odds of non-medical and medical use of prescription medication were present in this study for girls who reported penetrating/attempted penetrating forms of sexual victimization. For this group, the increased odds of non-medical use of opioid analgesic and sedative medications were dramatic, while there was no significant distinction in the medical use of prescription medication for the penetrating/attempted penetrating assaulted group when contrasted to the "no victimization" group. In contrast, respondents reporting non-penetrating forms of assault were more likely to report both medical and non-medical use of prescription medications than the "no victimization" group. Unfortunately our research cannot explain the reason(s) for the difference in medical use of prescription medication for the penetrating/attempted penetrating and non-penetrating assault groups. It is likely that the medical help seeking and/or receiving behaviors differ for these groups, with the girls reporting non-penetrating assault being more likely to receive health treatment, or at least receiving prescription medications. It may be, however, that the difference is due to victimized girls' willingness to inform their parents or guardians because access to health care for children and adolescents requires the involvement of those responsible for their welfare. Finally, it is important to recognize that the non-significant findings for the penetrating/attempted penetrating assaulted versus not assaulted group in terms of their medical use may be due to the low number of cases of participants reporting penetrating/attempted penetrating assault and thus inefficient power to detect differences. Future research is needed to further examine medical use among girls reporting penetrative assault, as well as their healthcare seeking and receiving experiences.

The annual prevalence rate of nonmedical use of prescription medications for this sample (15.5%) was similar to rates found in national samples of youth for 2008 (15.4%, Johnston, O'Malley, Bachman, & Schulenberg, 2009). The high annual prevalence rate of 39.9% for medical use of prescription opioid analgesic medications found in this female sample may be due to the fact that girls and women report higher rates of medical use of opioid analgesic medications than their male counterparts (McCabe et al., 2007; Roth-Isigkeit, Thyen, Stoven, Schwarzenberger, & Schmucker, 2005; Simoni-Wastila, 2000). Moreover, 30–40% of children and adolescents report experiencing pain in the past 3 months that was severe enough to interfere with daily activities and 46% of children and adolescents reported pain in the past 3 months that was severe enough to require health care utilization (Roth-lsigkeit et al., 2005). Thus, the high rates of medical use of opioid analgesic medication in our

[2]One out of 8, or 12% = 27.7% (percentage of sample reporting non-penetrating assault) × 42% (percentage of this assault group reporting non-medical opioid analgesic use).

adolescent sample may be due to the fact that youth commonly experience pain and seek medical attention in response to pain. Likewise, high rates of medical use of prescription opioid analgesic medications among adolescents may be related to the fact that third molar teeth are routinely extracted during this age period and opioid analgesics are commonly prescribed following such procedures (Hicks, 1999). Future research is clearly needed to understand the frequency and nature of adolescent experiences of pain and the medical use of prescription opioid analgesic medications.

Findings from this study clearly signify an unrecognized health concern for adolescent girls. However, this was an exploratory study of students from one community, and generalizations are limited. The study relied on self-report and, thus, may have resulted in underestimates; moreover, students who are consistently absent from school are known to have higher rates of illicit substance use (Johnston, O'Malley, Bachman, & Schulenberg, 2005). The study relied on survey data collected for a larger study; thus, the items in the original questionnaire present some limitations. For instance, the question in this study asking about medical use of drugs focused on whether the drug was prescribed by a health care provider rather than whether the drug was used as intended. It is possible to abuse prescription medications even though they were prescribed by a health care provider. Also, we did not ask about where girls obtained prescription medication without a doctor's order, whether they disclosed the assault to anyone, and their healthcare seeking and receiving behaviors. Finally, the correlational nature of the data means that causality and even temporal ordering of the relationships found in this study cannot be determined. Regardless of the limitations, this is the first known study to examine sexual victimization and prescription medication use among adolescents and thus provides an important contribution to the field.

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TABLE 1

Medical and non-medical prescription medication use among the sample

Type of medication% (n)	
Medical use of prescription medications	
Anxiolytics	2.7%(13)
Stimulants	2.3%(11)
Opioid analgesics	39.9%(198)
Sedatives	8.7%(42)
Any	44.3%(215)
Non-medical use of prescription medications	
Anxiolytics	1.0%(5)
Stimulants	1.0%(5)
Opioid analgesics	14.1%(68)
Sedatives	2.7%(13)
Any	15.5%(75)

TABLE 2

Summary of logistic regression analyses for sexual assault as a predictor of the medical and nonmedical use of four classes of prescription drugs

	Medical Prescription Use			Non-medical Prescription Use		
	% (n)	OR	95% CI	%(n)	OR	95% CI
Anxiolytics						
No Assault	1.4%(4)	–	–	1.0%(3)	–	–
Non-penetrating Assault	4.7%(8)	2.6	.7–9.3	0.6%(1)	0.2	.01–2.6
Penetrating Assault	6.3%(1)	2.5	0.2–25.5	6.3%(1)	2.0	.13–30.8
Stimulants						
No Assault	2.4%(7)	–	–	1.0%(3)	–	–
Non-penetrating Assault	2.4%(4)	0.9	.3–3.4	1.2%(2)	.4	.1–4.1
Penetrating Assault	0	0	0	0	0	0
Opioid Analgesics						
No Assault	35.2%(103)	–	–	9.8%(29)	–	–
Non-penetrating Assault	47.6%(81)	1.7**	1.1–2.5	18.7%(32)	1.8*	1.0–3.2
Penetrating Assault	56.3%(9)	2.3	0.8–6.5	43.8%(7)	5.4**	1.8–16.1
Sedatives						
No Assault	7.7%(23)	–	–	1.7%(5)	–	–
Non-penetrating Assault	9.4%(16)	1.1	0.5–2.1	3.5%(6)	2.1	0.6–7.1
Penetrating Assault	18.8%(3)	2.7	0.5–9.0	12.5%(2)	5.7*	.9–37.6
Any Use						
No Assault	38.6%(115)	–	–	11.1%(33)	–	–
Non-penetrating Assault	53.2%(91)	1.8**	1.2–2.7	20.5%(35)	2.1*	.9–2.8
Penetrating Assault	56.3%(9)	2.0	0.7–5.6	43.8%(7)	4.2**	1.4–13.0

†Note: Contrast group for assault groups was the “no assault” group. Binge drinking and illicit drug use were entered into all equations as a control variable prior to the sexual assault variable.

*p< .05,

**p< .01,

***p< .001.