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Mental Health Consequences of Sexual Assault among First-Year College Women

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Abstract

Objective: One in five college women experience unwanted sexual contact while in college, with first-year women being at the greatest risk. Given these data, we investigate how first-semester sexual assault impacts college women's mental health.

Participants: 483 female first-year students enrolled in the study during the first month of college.

Methods: All participants completed a health questionnaire when they arrived on campus and again at the end of their first semester.

Results: Twelve percent of participants reported sexual assault during the first semester of college. After controlling for baseline mental health and precollege sexual assault history, sexual assault during the first semester predicted clinically significant levels of anxiety and depression at the end of that semester.

Conclusions: The occurrence of sexual assault early in college has adverse mental health consequences.

Keywords

Sexual assault; college women; mental health; anxiety; depression

Approximately one in five female students report nonconsensual, unwanted sexual contact during their college years [1–3]. College women in their first year are at the highest risk for

sexual assault [4–5]. In one study, rates of past-year unwanted sexual contact were highest in the first year (17%) and declined year-by-year to 11% of seniors [1]. Researchers have argued that first-year women are in a “red zone” for increased risk of sexual assault [6]. The red zone effect holds true across different types of sexual assault; for example, in a sample of women from 22 colleges, first-year women were 2.0 to 4.6 times more likely than their older peers to experience drug-and-alcohol-facilitated sexual assault as well as attempted or completed forcible rape [6]. Furthermore, this risk generalizes across contexts, as first-year women are more likely to experience sexual assault in both party and non-party settings [6]. Thus, first-year women should be a high priority for research on the causes and consequences of sexual assault on college campuses.

Systematic study of sexual assault is important for many reasons, including the deleterious effects it can have on survivors’ health [7]. Sexual assault has been associated with injury as well as a range of mental disorders. In community samples, clinically significant symptoms of PTSD, depression, anxiety, suicidal ideation, and substance abuse have been observed in adult women [8]. In a representative national sample of women, a lifetime history of rape was associated with elevated prevalence of PTSD (36%), major depression (36%) and alcohol abuse (20%) [9].

Only a few studies have documented mental health sequelae of sexual assault among college women. In one study, Zinzow and colleagues [10] reported the odds of lifetime diagnoses of PTSD and depression increased by two- to four-fold based on having experienced rape. A second study found that experiencing unwanted and nonconsensual sexual contact *since entering college* was associated with symptoms of depression and PTSD [11]. The results from these two studies corroborate results from community samples but they are both limited because they used cross-sectional designs that cannot separate the effects of recent sexual assault from those of prior sexual assault and baseline mental health.

To advance understanding the association between sexual assault and mental health outcomes, longitudinal designs can control for the effects of prior assault. This is important because a substantial proportion of first-year students enter college already having experienced sexual assault [4, 12–13]. It is well known that earlier sexual assault predicts future sexual assault [4, 14–15]. Furthermore, mental health symptoms (e.g., depression) and health risk behaviors (e.g., alcohol use) can be both sequelae and predictors of sexual assault [16–18]. Because studies implementing a cross-sectional design or examining mental health only after an assault has occurred cannot clarify the unique impact of a recent sexual assault on mental health, prospective designs with appropriate controls are essential.

One longitudinal study of first-year students in Germany [19] found that baseline depression and prior sexual assault uniquely predicted subsequent depression and sexual assault in students’ second and third years. However, after accounting for these baseline predictors, sexual assault during the first year of college also uniquely predicted depressive symptoms when students were assessed in their third year. This study highlights the importance of longitudinal designs. To our knowledge, no such longitudinal studies have been conducted using a U.S. sample.

In summary, the mental health consequences of sexual assault warrant investigation among first-year women, who are especially vulnerable to sexual assault. Longitudinal designs are optimal for discerning causal patterns due to the complicated bidirectional relationships between mental health and sexual assault over time. Therefore, the present study used data drawn from the Women's Health Project (WHP), a prospective, longitudinal study of first-year college women. The WHP assessed a broad range of academic and health behaviors as well as markers of mental health [20]. With these data, the present study examined the impact of sexual assault that occurred in the first semester on mental health at the end of that semester, controlling for baseline sexual assault and mental health. We hypothesized that first-semester sexual assault would be associated with higher rates of clinically significant depressive and anxious symptoms, even after controlling for the effects of baseline mental health and prior experiences of sexual assault.

Methods

Participants

Participants were 483 first-year female college students at a private university in the northeastern U. S. Women > age 25 or < age 18, scholarship athletes (who could not accept compensation due to NCAA regulations), and transfer students were excluded. Participants made up 26% of the incoming female class and were representative of the university's female student body with regard to race/ethnicity [20]. Specifically, 64% identified as white, 11% as Asian, 10% as Black, 9% as Hispanic, and 13% as other or multiple races. At baseline, 94% of participants were 18 years old, 29% were in a committed relationship, and 96% reported their sexual orientation as heterosexual.

Procedures

The university's Institutional Review Board approved all procedures. Starting August 2009, participants were recruited to a year-long study of women's health through a postal mailing sent to matriculating first-year women, as well as through campus flyers, word of mouth, and a research participant pool. Interested students attended an orientation meeting, after which they provided written informed consent and completed the baseline survey. Subsequently, participants completed monthly web-based surveys throughout the calendar year, which they completed in the first week of each month about the events of the previous month. For the current report, data from baseline assessment (reflecting August) and the end of the semester assessment (reflecting December) were used. Participants received \$20 for the baseline survey and \$10 for the follow-up survey.

Measures

Demographics.—Participants provided information about their age and race/ethnicity at baseline.

Sexual assault.—Sexual assault was assessed at baseline and at the end of the first semester using the Sexual Experiences Survey-Revised (SES-R) [21]. The 20-item SES-R uses four perpetrator tactics as question stems [verbal coercion (i.e., “overwhelm you with arguments about sex or continual pressure for sex”), physical force (i.e., “use physical

force”), threats (i.e., “threaten to harm you or someone close to you”), and incapacitation (i.e., “perform sexual acts while you were incapacitated by drugs or alcohol and unable to object or consent”)] and assesses five types of sexual contact for each [unwanted touching (i.e., “fondle, kiss, or touch sexually”), oral sex (i.e., “make you do oral sex or have it done to you”), attempted vaginal intercourse (i.e., “try to have sexual intercourse, but it did not happen”), completed vaginal intercourse (i.e., “succeed in making you have sexual intercourse”), and anal penetration (i.e., “anal sex or penetration with a finger or objects”)]. Participants reported how many times they had experienced each form of unwanted sexual contact (i.e., 0, 1, 2, 3, 4+) (a) prior to entering college since age 14, and (b) at the end of the first semester.

Sexual assault was defined as unwanted sexual outcomes (i.e., attempted/completed vaginal sex, oral sex, and anal penetration, excluding touching) achieved through physical force, threats, and incapacitation (excluding verbal coercion). This definition conforms to that provided by the Centers for Disease Control and Prevention, which defines sexual violence as “a sexual act that is committed or attempted by another person without freely given consent of the victim or against someone who is unable to consent or refuse” [22, p. 11].

Depression.—Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9) [23]. Participants reported how frequently they experienced each symptom (e.g., “feeling down, depressed, or hopeless”) during the past two weeks on a scale from 0 to 3 (0 = *not at all*; 1 = *several days*; 2 = *more than half the days*; 3 = *nearly every day*). The nine items were summed with scores ranging from 0 to 27. In this study, Cronbach’s alpha was .81 and .89. The depression scores were skewed corresponding to the substantial proportion of participants endorsing zero symptoms. In initial validity testing of the PHQ-9, Kroenke, Spitzer, and Williams [24] suggested using a cut-point of 10 to identify clinically meaningful symptoms of depression, and subsequent work has supported the use of 10 as the cut-point score to identify meaningful depression scores [25–26]. Thus, participants scoring 10 were coded as positive for depression.

Anxiety.—Anxiety was assessed using the Generalized Anxiety Disorder-7 (GAD-7) [27]. Participants reported how frequently they experienced each symptom (e.g., “feeling nervous, anxious or on edge”) during the past two weeks on a scale from 0 to 3 (0 = *not at all*; 1 = *several days*; 2 = *more than half the days*; 3 = *nearly every day*). The seven items were summed with total scores ranging from 0 to 21. Cronbach’s alpha was .86 and .91. Responses on the GAD-7 measure were also positively skewed. Spitzer et al. [27] demonstrated that a cut point of 10 on the GAD-7 achieves nearly maximal sensitivity with specificity exceeding .80. Scores were dichotomized using a cut score of 10 to distinguish between those with (or without) clinically significant anxiety symptoms.

Data Management and Analyses

A dichotomous sexual assault variable was created from the baseline and end-of-semester surveys that reflected whether participants had experienced attempted or completed vaginal rape, oral sex, or anal penetration due to physical force, threats, or incapacitation. Participants were considered missing if they failed to complete a survey or if they had

missing data on the sexual assault questions, unless they positively endorsed one or more of the sexual assault outcomes. Participants were categorized as not having experienced sexual assault at a given time point if they completed the survey and reported no sexual assault of any type.

Two separate logistic regressions explored the associations among baseline sexual assault, baseline mental health, first-semester sexual assault, and each of the two mental health outcomes at the end of the first semester. To determine whether the effects of first-semester sexual assault on mental health varied by baseline mental health and/or sexual assault, interaction effects between first-semester sexual assault and baseline sexual assault as well as distress were also entered into the respective models. No interaction effects emerged as significant ($p > .05$), so they are omitted from the final models presented here.

Results

Preliminary Analyses

All participants completed the baseline assessment. Only 13% of participants ($n = 64$) had missing data for the end-of-semester assessment. Most cases of missing data occurred because participants did not complete any portions of the assessment ($n = 62$). Completers did not differ from women who did not complete the follow-up survey in terms of age ($t(481) = .01, p = .99$), race ($\chi^2(4, N = 483) = .35, p = .55$), baseline depression ($\chi^2(1, N = 483) = .56, p = .45$) or baseline anxiety ($\chi^2(1, N = 483) = .99, p = .32$). Non-completers were more likely to report a history of prior sexual assault at baseline (60%) than completers (23%) ($\chi^2(1, N = 483) = 35.56, p < .001$).

Before beginning college, 28% of women ($n = 135$) reported experiencing unwanted attempted vaginal intercourse, vaginal intercourse, oral sex, or anal penetration due to threats, physical force, or physical incapacitation since age 14. During the first semester, 12% of women reported experiencing attempted (11%) or completed (7%) sexual assault due to threats, force, or incapacitation. Precollege sexual assault was significantly associated with first-semester sexual assault ($\chi^2(1, N = 444) = 10.8, p < .001$), such that those with a history of sexual assault at baseline were more than twice as likely to experience sexual assault in their first semester (20%) relative to those without a pre-college history (8%).

At baseline, 13% and 17% of women reported clinically significant depression and anxiety symptoms, respectively. At the end of the first semester, 14% and 14% reported clinically significant depression and anxiety, respectively.

Planned Analyses

Depression.—The overall logistic regression model was significant ($\chi^2(3, N = 419) = 42.46, p < .001$; Nagelkerke $R^2 = .17$), and revealed that women who experienced first-semester sexual assault were more likely to have clinically significant depression symptoms at the end of the first semester ($\chi^2(1, N = 419) = 5.41, p = .020$). Controlling for baseline depression and prior assault history, women who experienced first-semester sexual assault were approximately 2.5 times more likely to have meaningful depression symptoms (OR = 2.45) compared to women who were not assaulted in their first semester (Table 1). Baseline

depression also predicted depression at the end of the semester ($\chi^2(1, N = 419) = 35.27, p < .001$), whereas baseline sexual assault did not ($\chi^2(1, N = 419) = 1.41, p = .24$).

Anxiety.—The overall logistic regression model was significant ($\chi^2(3, N = 419) = 28.54, p < .001$; Nagelkerke $R^2 = .12$), and revealed that women who experienced first-semester sexual assault were more likely to have clinically significant anxiety symptoms at the end of the first semester ($\chi^2(1, N = 419) = 3.94, p = .047$). Controlling for baseline anxiety and prior assault history, women who experienced first-semester sexual assault were more than twice as likely to experience clinically significant anxiety ($OR = 2.16$) compared to women who were not assaulted in their first semester (Table 2). Baseline anxiety also predicted anxiety at the end of the semester ($\chi^2(1, N = 419) = 24.84, p < .001$), but baseline sexual assault did not ($\chi^2(1, N = 419) = .29, p = .59$).

Comment

This study provides one of the few prospective investigations of the mental health consequences of sexual assault among college women, and the first (to our knowledge) exclusively sampling women in their first semester at a residential college in the United States. We highlight three findings with important public health implications.

First, 28% of the participants in our study reported at least one sexual assault prior to college entry, and 12% reported a sexual assault during their first semester of college. As we have previously reported, the incidence of sexual assault remains high throughout the first year of college [12]. Such disturbingly high rates corroborate prior reports [2, 3], and reaffirm that sexual assault among college women is a major public health concern. Having a history of sexual assault is a strong predictor of sexual assault in the first semester of college, more than doubling the risk.

Second, elevated symptoms of anxiety and depression occur frequently among first-year college women. At least 1 in 6 women reported anxiety and at least 1 in 8 started college with symptoms of depression that exceeded clinical thresholds. These findings corroborate prior reports [28, 29], documenting the prevalence of mental health concerns among college students. Therefore, the current results highlight the need for increased attention to mental health among college students.

Third, the most unique finding is the prospective confirmation that experiencing sexual assault during the first semester of college is associated with elevated rates of clinically significant symptoms of anxiety and depression. Consistent with prior research on sexual assault and depression in college students [19], this association holds after adjusting for pre-college sexual assault and baseline mental health. Approximately one of nine female students in their first-semester reported sexual assault, and adverse mental health consequences were observed by the end of the first semester. Given that depression and anxiety adversely affect academic performance as well as retention in college [30], preventing sexual assault is important for both health and academic outcomes.

The results of this study have implications for sexual assault prevention and mental health care. With respect to prevention, promising strategies for sexual assault prevention are

emerging that range from policy to campus-based programming [for reviews see 31–32]. Although *universal* prevention approaches are essential, these findings highlight the need to develop *selective* prevention programming for women with a history of sexual assault. Research is elucidating some of the mechanisms that mediate the relationship between prior experience of assault and revictimization, such as self-blame [33], low sexual assertiveness [34], and impaired risk assessment [35]. Thus, programs that promote risk assessment, assertive communication, and empowerment via self-defense skills are recommended for women with prior victimization histories [36].

With respect to mental health care, the rates of clinically significant depression and anxiety (14%) symptoms after the first semester are also concerning. We found that the experience of sexual assault in the first semester had a direct impact on the rates of mental health problems: more than 25% of women who experienced first-semester sexual assault reported clinically significant depression and anxiety at the end of that semester. The impact of sexual assault on a woman's mental health can be understood within an ecological model [8]. Specifically, the likelihood of self-blame and distress after an assault is influenced not only by characteristics of the individual (e.g., prior victimization) and the nature of the assault, but also by the responses of her interpersonal, community and cultural environments. This perspective implies that creating supportive opportunities to disclose the assault and access services [37] can help to mitigate the negative mental health sequelae.

Implications of these findings are twofold. First, it is important to raise awareness of the link between unwanted sexual experiences and symptoms of depression and anxiety in order to promote help seeking. Because depressive symptoms serve as an independent vulnerability factor for later sexual assault [19], it is crucial for women who experience distress following assault experiences to be able to receive mental health treatment, support, and intervention. Second, college mental health professionals who treat young women for depression or anxiety symptoms should be aware that sexual assault could be a contributing factor. A comprehensive sexual assault prevention strategy must engage counseling services in treating mental health sequelae and preventing revictimization.

Limitations

We acknowledge several limitations of this study. First, the data were obtained by self-report, which can be affected by social (e.g., demand characteristics, stigma) and cognitive (e.g., memory) factors [38]. However, use of a self-administered, computerized survey is known to increase reports of socially stigmatized behaviors, suggesting increased validity [39].

Second, to maintain a prospective design, the mental health outcomes were assessed at the end of the semester. If an assault had occurred at the beginning of the semester, then it is possible that the levels of depression and anxiety experienced at the end of the semester may have been muted. The effects reported herein likely underestimate the actual short-term mental health consequences of sexual assault. To more precisely capture the short-term effects, future studies might assess sexual assault as well as mental health closer in time, for example, by using ecological momentary assessments, a method that is increasingly feasible as smartphones become nearly universal among college students [40].

Third, although we obtained a large sample, it included only 26% of the incoming class and relied upon volunteers. Even though the sample's demographic characteristics did not differ from those of the larger student population, it is possible that participating students may have differed in ways that we did not measure.

Fourth, 13% of participants did not provide data at the follow-up assessment. Although there were no differences in terms of baseline mental health between those who did and did not complete the follow-up survey, women with a history of sexual assault at baseline were less likely to complete the follow-up survey than women without a history. This attrition might under- or over-estimate the effects of baseline sexual assault in particular.

Conclusions

In sum, 12% of first-year women in our study reported at least one instance of sexual assault during the first semester in college. We documented significant adverse mental health effects of those experiences, independent of pre-college history of sexual assault and mental health status at the start of the semester. Thus, experiencing a sexual assault increases the likelihood that female students will end the semester with clinically significant depression and anxiety. These findings add to the urgency of preventing sexual assault on college campuses.

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Implications and Contribution:

This study demonstrates that experiencing sexual assault during the first semester of college is prospectively associated with clinically elevated levels of anxiety and depression.

Table 1

Logistic Regression Examining the Predictors of Depression at the End of the First Semester

Variables	<i>B</i>	<i>SE B</i>	Wald χ^2	OR	95% CI	
					Lower	Upper
Baseline Depression	1.96	.33	35.27***	7.13	3.73	13.62
Baseline SA	.39	.33	1.41	1.48	.77	2.84
First-Semester SA	.90	.39	5.41*	2.45	1.15	5.23

Note.

*
p .05.***
p .001.

SA = sexual assault; OR = adjusted odds ratio. Odds ratios > 1 indicate that as the predictor variable increases, the odds of having clinically significant depression also increases.

Table 2

Logistic Regression Examining the Predictors of Anxiety at the End of the First Semester

Variables	<i>B</i>	<i>SE B</i>	Wald χ^2	OR	95% CI	
					Lower	Upper
Baseline Anxiety	1.52	.31	24.84***	4.59	2.52	8.36
Baseline SA	-.19	.35	.29	.83	.41	1.65
First-Semester SA	.77	.39	3.94*	2.16	1.01	4.62

Note.

*
p .05.***
p .001.

SA = sexual assault; OR = adjusted odds ratio. Odds ratios > 1 indicate that as the predictor variable increases, the odds of having clinically significant anxiety also increases.