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National Prevalence of PTSD Among Sexually Revictimized Adolescent, College, and Adult Household-Residing Women

Kate Walsh, Carla Kmett Danielson, Jenna L. McCauley, Benjamin E. Saunders, Dean G. Kilpatrick, and Heidi S. Resnick

Department of Psychiatry & Behavioral Sciences, Medical University of South Carolina

Abstract

Context—Despite empirical links between sexual revictimization (i.e., experiencing two or more sexual assaults) and posttraumatic stress disorder (PTSD), no epidemiological studies document the prevalence of sexual revictimization and PTSD. Establishing estimates is essential to determine the scope, public health impact, and psychiatric sequelae of sexual revictimization.

Objective—Estimate the prevalence of sexual revictimization and PTSD among three national female samples (adolescent, college, adult household probability).

Design—Surveys were used to collect data from The National Women’s Study – Replication (2006; college) as well as household probability samples from the National Survey of Adolescents-Replication (2005) and the National Women’s Study-Replication (2006; household probability).

Setting—Households and college campuses across the U.S.

Participants—1,763 adolescent girls, 2,000 college women, and 3,001 household-residing adult women.

Main Outcomes—Behaviorally specific questions assessed unwanted sexual acts occurring over the lifespan due to use of force, threat of force, or incapacitation via drug or alcohol use. PTSD was assessed with a module validated against the criterion standard, Structured Clinical Interview for DSM-IV.

Results—52.7% of victimized adolescents, 50.0% of victimized college women, and 58.8% of victimized household-residing women reported sexual revictimization. Current PTSD was reported by 20.0% of revictimized adolescents, 40.0% of revictimized college women, and 27.2% of revictimized household-residing women. Compared to non-victims, odds of meeting past 6-month PTSD were 4.3–8.2 times higher for revictimized respondents and 2.4–3.5 times higher for single victims.

Conclusions—Population prevalence estimates suggest that 769,000 adolescent girls, 625,000 college women, and 13.4 million women in US households reported sexual revictimization. Further, 154,000 sexually revictimized adolescents, 250,000 sexually revictimized college women, and 3.6 million sexually revictimized household women met criteria for past 6-month PTSD. Findings highlight the importance of screening for sexual revictimization and PTSD in pediatric, college, and primary care settings.

Address correspondence to Kate Walsh, Ph.D., National Crime Victims Research and Treatment Center, Medical University of South Carolina, 67 President Street, 2 South, MSC861 Charleston, SC 29455. walsk@musc.edu.

The first and last authors had full access to the data and take responsibility for the integrity of the data and the accuracy of the data analysis.

Sexual victimization (SV) is an endemic societal problem associated with a range of mental health sequelae such as anxiety, depression, posttraumatic stress disorder (PTSD), substance abuse, interpersonal difficulties, and health problems including HIV¹. SV disproportionately affects girls and women, with female victims reporting more than 90% of all sexual assaults². Epidemiological studies have documented higher PTSD estimates among women^{3,4}, leading to some speculation that gender differences in the experience of SV account for higher estimates of PTSD observed among women⁵. However, some studies have found higher estimates of PTSD to exist among women even after controlling for sex differences in exposure to different traumatic stressors⁶. As recently noted⁷, more research on the prevalence of PTSD following specific types of victimization experiences is warranted. One such common victimization experience that has received little attention in the epidemiological literature is sexual revictimization (i.e., two or more sexual assaults/rapes across the lifespan).

Prevalence Estimates of Sexual Victimization and Revictimization

Studies suggest that 20–25% of female children experience sexual abuse⁸. Among college women, 15–20% report a rape or attempted rape during childhood, adolescence, or adulthood⁹, and general population estimates suggest that between 13 and 25% of adult women will experience a sexual assault during their lifetimes^{10,11}. Robust associations between early sexual abuse and subsequent sexual victimization have been well-documented among college and community women¹². Meta-analyses suggest a medium effect size (.59) for the association between early SV and later SV with stronger effect sizes (.64) emerging when more restrictive definitions of victimization (e.g., penetration) are used compared to broader definitions (.38) of victimization (e.g., exhibitionism)¹³. Although reviews suggest that 10–20% of adolescents who report child sexual abuse will be revictimized prior to age 19, as many as 2 out of 3 women with a history of child sexual abuse report sexual revictimization¹². Despite cross-sectional and longitudinal evidence of the link between early SV and later revictimization, there are no epidemiological studies establishing the prevalence of sexual *revictimization*. Indeed, using the search term “sexual revictimization,” 117 journal articles were abstracted in PsycInfo for the years 1981–2011 as of January 20, 2012; none describe the lifetime prevalence of sexual revictimization among representative samples of women. Thus, the present study addresses this gap by examining the prevalence of sexual revictimization in three different populations using national epidemiologic data from adolescent, college, and household-residing women.

Prevalence Estimates of PTSD associated with Sexual Victimization and Revictimization

As noted above, experiencing a single SV is associated with problems across a number of domains, including substance abuse, interpersonal problems, and psychiatric disorders (e.g., PTSD, Panic Disorder, depression). Reviews of research with non-nationally representative samples suggest that women who experience revictimization are at even greater risk for such problems, particularly PTSD, in comparison to singly victimized women¹². PTSD is costly to the individual, the family, and society at large given its association with increased use of the health care system, and both the direct (medical/mental health treatment, pharmacological interventions, case management) and indirect health care costs (e.g., loss of wages and productivity)^{14,15}. Early screening and treatment may reduce this burden; however, the scope and severity of the problem has not been adequately described in past work. Although the National Women’s Study, conducted in 1990, found that nearly one-third of rape victims developed PTSD¹⁶, no representative studies have reported on estimates of PTSD among sexually revictimized women specifically. The present study

addresses this gap by using from probability samples to explore the prevalence of PTSD among adolescent, college, and household-residing women reporting sexual revictimization.

The Current Study

The current study used data from three national probability samples of women (adolescent, college, and household-residing women) to better understand the prevalence of sexual revictimization as well as the prevalence of current and lifetime PTSD among revictimized women. For comparison, we also assessed PTSD prevalence among women reporting a single sexual victimization. Based on reviews of studies utilizing samples of convenience¹², it was expected that 10–20% of sexually victimized adolescents would report revictimization and 60–70% of sexually victimized college and adult household-residing women would report revictimization. Further, given greater severity of PTSD symptoms among revictimized women¹, it was expected that estimates of PTSD among revictimized women would be substantially higher than the 30% prevalence estimates of PTSD observed for singly victimized women. Determining accurate estimates of the prevalence of sexual revictimization, as well as better understanding the role of sexual revictimization in the prediction of PTSD, will inform screening, assessment, and intervention efforts in this domain among mental health providers serving adolescent and adult female populations.

Methods

Participants and Procedures

Data for the present study were drawn from two separate studies, encompassing three separate sampling frames: adolescent participants were part of the National Survey of Adolescents-Replication (NSA-R) and college and household-residing participants were part of the National Women's Study-Replication (NWS-R). All procedures for each of the three studies were approved by the Institutional Review Board of the Medical University of South Carolina.

Adolescent participants—The NSA-R¹⁷ is a longitudinal, nationally representative study of adolescents aged 12–17 years (N=3,614 at wave 1) designed to assess the prevalence, risk factors, and mental health outcomes of exposure to potentially traumatic events. The study was conducted as a Random Digit Dial (RDD) telephone survey of households with children between the ages of 12 and 17 and included an oversample of urban households. The RDD method involved use of telephone banks within specified geographic regions using the comprehensive database of telephone hundred banks (defined as each block of 100 potential telephone numbers with an exchange that includes one or more residential listings). Once a block had been selected, a two-digit random number in the range of 00–99 was appended to the block to form a ten-digit telephone number. Once household eligibility was determined (i.e., the home had at least one youth in the desired age range), screening and introductory interviews were conducted with parents to establish rapport. Parents were asked if the (randomly) selected child could also participate in the study and were provided the opportunity to call a toll-free number to confirm the authenticity of the study. When possible, adolescents were interviewed immediately following parent interviews. If adolescents were unavailable, interviewers scheduled appointments and/or called back at different times of the day or days of the week. After obtaining informed consent from a parent and assent from the adolescent, interviews were conducted using Computer-Assisted Telephone Interviewing (CATI) technology by employees of Abt Schulman, Ronca, & Bucuvalas, Inc (Abt SRBI) who were well trained, highly skilled, and experienced in conducting this type of interview. Adolescents were offered an incentive of \$10 to complete the survey, which averaged 43 minutes in length. Of

the 6694 parents who were interviewed, 5426 (81.1%) gave permission for a randomly selected adolescent per household to be contacted. A total of 3921 (72.3%) of adolescents with parental permission for contact were located during the field period and informed about the study. The remaining 1505 adolescents with parental permission could not be contacted during the field period. Of the 3921 adolescents who were contacted and informed about the study, 188 refused to participate, 119 started the interview but did not complete it, and 3614 completed the interview. Therefore, the percentage of completed adolescent interviews among households with eligible adolescents (i.e., those with parental permission for contact; $n=5426$) was 66.6%. The percent of completed interviews among eligible adolescents who were contacted and informed about the study ($n=3921$) was 92.2%, indicating that the vast majority of adolescents who could be contacted completed interviews. Only the 1,763 NSA-R female participants at wave 1 (collected in 2005) were included in the present study. To correct for oversampling, data were weighted to bring the sample in line with the adolescent U.S. population based on 2005 Census data¹⁷. Mean age of participants at Wave 1 was 14.5 years ($SD = 1.71$). Regarding racial/ethnic makeup, 69% were Caucasian, 13% were African-American, 10% were Hispanic, 3% were Native American, and 3% were Asian/Pacific Islander. Demographic characteristics of the female-only sample did not differ significantly from the full sample.

College participants—The NWS-R¹⁸ is a telephone survey of the prevalence and characteristics of rape that was conducted in 2006. Following informed consent, the 20-minute structured phone survey was administered by trained female interviewers at Abt SRBI utilizing CATI technology. College participants were 2,000 college women recruited from the American Student List (ASL). The ASL included 6 million students who were attending approximately 1,000 U.S. colleges and universities. SRBI purchased a sample containing nearly 17,000 women to generate responses that were similar to the national census representation of college women. Following classification of the sample by region, the list was released to be dialed in proportion to the national census (2000) representation of college women. The sample was classified into nine regions: New England, Mid Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific. The sample was then released to be dialed in proportion to the national census representation of college women. This procedure was designed to ensure adequate representation to the U.S. population of college women. There were 253 different colleges included in the sample from 47 different states. Of those contacted ($n = 3805$), 28.8% ($n = 1,094$) were ineligible for participation. Among those eligible for participation ($n = 2711$), 8.9% ($n = 240$) refused to participate and 17.7% ($n = 480$) did not complete the interview; thus, the completion rate among eligible participants was 73.8%. Mean age was 20.1 ($SD = 1.7$) with a range from 18–67. Approximately 75% ($n = 1500$) of the sample reported their race as White, 11.1% ($n = 221$) reported their race as Black, 6% ($n = 120$) as Hispanic, 1.1% ($n = 22$) Native American, and 6% ($n = 120$) Asian, and 0.4% ($n = 8$) chose not to report their race. For a detailed description of the methodology, see the final report to the National Institute of Justice¹⁹.

Adult household-residing participants—A household probability sample of 3,001 adult women also participated in the National Women's Survey-Revised (NWS-R) phone survey (see above for description). Whereas the college NWS-R participants were selected using the American Student List, the household-residing NWS-R participants were sampled via Random Digit Dialing methods (see National Survey of Adolescents-Revised sampling description). The use of this method introduces a randomization process in the selection of telephone numbers. Of those contacted ($n = 15,982$), 76.2% ($n = 12,182$) were ineligible for participation. Of those eligible for participation ($n = 3817$), 12.9% ($n = 492$) refused to participate and 8.5% ($n = 324$) did not complete the interview. Thus, the cooperation and

interview completion rate among eligible participants was 78.6%. Because the majority of women in the general population sample were between the ages of 18–34 years (younger women were oversampled to assist comparisons to college women), weightings were created to approximate 2005 US Census estimates²⁰, and the sample had mean weighted age of 46.6 ($SD = 17.87$), and an age range of 18–86. Approximately 78.2% ($n = 2348$) of the sample reported their race as White, 11.1% ($n = 334$) reported their race as Black, 5.3% ($n = 158$) Hispanic, 1.9% ($n = 57$) Native American, and 1.7% ($n = 50$) Asian, and 1.7% ($n = 54$) chose not to report their race. Regarding education, 64.5% of community participants ($n = 1,936$) had attended some college or beyond and 2.7% ($n = 82$) were enrolled in college at the time of the survey.

Measures

Sexual victimization history—Consistent with previous studies (e.g., NSA²¹ and NWS²²), SV history was assessed here using behaviorally specific, dichotomous questions regarding a series of unwanted sexual experiences, including: (a) forced anal, vaginal, and/or oral sex; (b) forced digital penetration and/or foreign object penetration; and/or (c) either of the aforementioned events when the individual was voluntarily or involuntarily incapacitated by drugs and/or alcohol. Specifically, participants were asked: 1) whether a man or boy ever made you have vaginal, anal, or oral sex (adolescent version = put his private sexual part inside your private sexual part, inside your rear end, or inside your mouth) when you didn't want to by using force or threatening to hurt you or someone close to you? 2) whether a man or boy ever made you have vaginal, anal, or oral sex when you didn't want to after you had taken or been given so much alcohol or drugs that you were very high, drunk, or passed out? 3) whether anyone (male or female) ever inserted fingers or objects into your vagina or rectum when you didn't want them to by using force or threatening to hurt you or someone close to you? 4) whether anyone (male or female) ever inserted fingers or objects into your vagina or return when you didn't want them to after you had taken or been given so much alcohol or drugs that you were very high, drunk, or passed out? The NSA-R also included two specific questions about unwanted touching of the respondent's sexual parts 1) by using force or threat of force or 2) after the respondent had taken or was given so much alcohol or drugs that they were very, high, drunk, or passed out. Due to NSA-R respondents' ages, even non-penetrative sexual contact that is unwanted or perpetrated by a family member was considered abusive. For each screening event endorsed, participants also were asked whether the events they had experienced occurred once, twice, or three or more times. Participants were classified as revictimized if they endorsed experiencing two or more separate incidents.

PTSD—The PTSD module of the NSA²¹ and the NWS²² was used to assess current PTSD symptoms as well as functional impairment due to PTSD symptoms. This structured diagnostic interview assessed each DSM-IV symptom with a yes/no response indicating the presence of a symptom during the participant's lifetime as well as during the previous 6 months. This measure was validated against the PTSD module of the Structured Clinical Interview for the *DSM* (SCID) administered by mental health professionals²⁴, and research provides support for its concurrent validity, temporal stability, internal consistency, and diagnostic reliability^{21,23}.

Results

Prevalence of Revictimization and PTSD by Victimization Group

Adolescent girls—Among adolescent girls, approximately 11.6% ($n = 205$) reported sexual victimization, with 5.5% ($n = 97$) reporting only one victimization and 6.1% ($n = 108$) reporting revictimization. Among victimized adolescents, 52.7% experienced

revictimization. Among revictimized adolescents, 19.4% ($n = 21$) met criteria for past 6-month PTSD, and 27.8% ($n = 30$) met criteria for lifetime PTSD. Among single victims, PTSD estimates were lower, with 13.4% ($n = 13$) of single victims meeting past 6-month criteria for PTSD and 23.7% ($n = 23$) meeting lifetime criteria for PTSD (see Table 1). Chi-square analyses revealed that revictimized adolescents were significantly more likely to report past 6-month PTSD, $\chi^2(df = 2, n = 200) = 7.8, p < .05$, and lifetime PTSD, $\chi^2(df = 2, n = 199) = 11.3, p < .003$, when compared to singly victimized adolescents.

College women—Among college women, 12.5% ($n = 250$) reported at least one sexual victimization with 6.3% ($n = 125$) reporting a single victimization and 6.3% ($n = 125$) reporting revictimization. Approximately 50.0% of victimized college women experienced revictimization. Among revictimized college women ($n = 125$), 40% ($n = 50$) met criteria for past 6-month PTSD and 58.4% ($n = 73$) met criteria for lifetime PTSD. In comparison, 24% of single assault victims met criteria for past 6-month PTSD and 34% met criteria for lifetime PTSD (See Table 1). Single assault victims reported significantly lower estimates of PTSD. Chi-square analyses revealed that revictimized college women were significantly more likely to report past 6-month PTSD, $\chi^2(df = 1, n = 252) = 10.4, p < .001$ and lifetime PTSD, $\chi^2(df = 1, n = 252) = 18.4, p < .001$, when compared to singly victimized college women.

Adult household-residing women—Among adult household-residing women, 20.0% ($n = 600$) reported at least one sexual victimization with 8.2% ($n = 247$) reporting a single victimization and 11.8% ($n = 353$) reporting revictimization. Approximately 58.8% of victimized women experienced revictimization. Among revictimized women ($n = 353$), 27.2% ($n = 96$) met criteria for past 6-month PTSD and 45.6% ($n = 161$) met criteria for lifetime PTSD. In comparison, single assault victims reported significantly lower estimates of PTSD, with 13.7% ($n = 34$) meeting criteria for past 6-month PTSD and 25.1% ($n = 62$) meeting criteria for lifetime PTSD (see Table 1). Chi-square analyses revealed that revictimized household-residing women were significantly more likely to report past 6-month, $\chi^2(df = 1, n = 600) = 13.9, p < .001$ and lifetime, $\chi^2(df = 1, n = 600) = 24.5, p < .001$, PTSD when compared to singly victimized women.

Predicting Likelihood of Past 6-Month and Lifetime PTSD from Victimization Type

Adolescent girls—Logistic regression analyses that included revictimization, single victimization, and age of participant, revealed that the adjusted odds of meeting criteria for past 6-month PTSD was 5.1 for revictimized adolescents, $B = 1.6, SE = .28, p < .001$, 3.3 for singly victimized adolescents, $B = 1.2, SE = .33, p < .001$, and 1.2 for older adolescents, $B = .21, SE = .07, p < .001$ (see Table 2). When logistic regression analyses predicting lifetime PTSD were conducted, a similar pattern of findings emerged such that the adjusted odds of meeting lifetime PTSD criteria was 4.3 for revictimized adolescents, $B = 1.5, SE = .24, p < .001$, and 3.5 for singly victimized adolescents, $B = 1.2, SE = .26, p < .001$. Age also was positively predictive such that older adolescents were more likely to meet lifetime criteria for PTSD, $Odds Ratio = 1.2, B = .22, SE = .05, p < .001$.

College women—Logistic regression analyses revealed that the adjusted odds of meeting criteria for past 6-month PTSD was 6.7 for revictimized college women, $B = 1.9, SE = .20, p < .001$, and 2.8 for singly victimized college women, $B = 1.0, SE = .23, p < .001$. Age, $B = 0.02, SE = 0.02, p = 0.31$, was not associated with likelihood of meeting past 6-month PTSD criteria. When logistic regression analyses predicting lifetime PTSD were conducted, a similar pattern of findings emerged such that the odds of meeting lifetime PTSD was 8.2 for revictimized college women, $B = 2.1, SE = .19, p < .001$, and 2.8 for singly victimized

college women, $B = 1.0$, $SE = .20$, $p < .001$. Age, $B = 0.02$, $SE = 0.02$, $p = 0.24$, was not associated with likelihood of meeting lifetime PTSD criteria.

Adult household-residing women—Logistic regression analyses revealed that the adjusted odds of meeting criteria for past 6-month PTSD was 5.8 for revictimized women, $B = 1.7$, $SE = .15$, $p < .001$, and 2.5 for singly victimized women, $B = 0.93$, $SE = 0.21$, $p < 0.001$. Younger age also was significantly predictive of past 6-month PTSD (Odds Ratio = 0.96, $B = -0.04$, $SE = 0.01$, $p < 0.001$). When logistic regression analyses predicting lifetime PTSD were conducted, a similar pattern of findings emerged such that the odds of meeting lifetime PTSD was 5.9 for revictimized, $B = 1.8$, $SE = .13$, $p < .001$, and 2.4 for singly victimized, $B = .86$, $SE = .16$, $p < .001$, women. Younger age also was associated with lifetime PTSD (Odds Ratio = .98, $B = -.02$, $SE = .003$, $p < .001$).

Sensitivity and Specificity of Any Victimization and Revictimization in Predicting PTSD: The sensitivity, specificity, positive predictive power (PPP) and negative predictive power (NPP) of any victimization versus no victimization and revictimization versus single victimization among each of the three samples is summarized in Table 3. Relative to no victimization, any victimization is associated with sensitivity of .31 to .49, specificity of .83 or higher, PPP of .17 to .45, and NPP of .86 to .96. However, among victims, revictimization (relative to single victimization) is associated with sensitivity of .57 to .74, specificity of .45 to .62, PPP of .20 to .58, and NPP or .75 to .86.

Exploratory Analyses: To better understand whether age (older adolescence/early adulthood) or environment (college) is associated with increased risk for sexual victimization/revictimization and the development of PTSD, we examined associations between revictimization and PTSD among women from the household-residing sample who were within the ages of 18–34 ($n = 879$). Among this subgroup, 10.7% ($n = 94$) had experienced a single victimization and 13.1% ($n = 115$) had been revictimized. Compared to singly victimized women, revictimized women were significantly more likely to meet criteria for past 6-month, $\chi^2 (df = 1, n = 879) = 9.8$, $p < .01$, and lifetime, $\chi^2 (df = 1, n = 879) = 9.4$, $p < .01$, PTSD. Specifically, 40% and 55% of revictimized women met criteria for past 6-month and lifetime PTSD, respectively, compared to 19% and 34% of singly victimized women. Approximately 9% ($n = 78$) of the women in this subgroup were currently in college. Although power to detect significant effects may have been low, there were no significant differences between women currently in college and those not in college in terms of victimization, $\chi^2 (df = 1, n = 879) = .50$, $p = .48$, revictimization, $\chi^2 (df = 1, n = 879) = .6$, $p = .44$, past 6-month PTSD, $\chi^2 (df = 1, n = 879) = .16$, $p = .67$, or lifetime PTSD, $\chi^2 (df = 1, n = 879) = .005$, $p = .94$.

Discussion

Although sexual revictimization and PTSD have been the topic of myriad research articles during the last three decades, no published studies to date have utilized national probability samples of adolescent girls and women to better understand the scope of the problem of sexual revictimization across the lifespan. Further, although many of these studies using samples of convenience have suggested strong linkages between sexual revictimization and PTSD symptoms, none have explored the prevalence of PTSD in relation to sexual revictimization among representative samples of female adolescents and women. Thus, the present study examined PTSD prevalence among sexually revictimized women using three national epidemiological samples: adolescent, college, and household-residing women. Approximately 11% of adolescents, nearly 13% of college women, and 20% of household-residing women reported any sexual victimization. Although these estimates are somewhat lower than those found in other studies¹², definitions used here were more restrictive than

those used in previous studies (e.g., unwanted fondling, kissing, and verbally coercive tactics were excluded here). In fact, with the exception of a small number of adolescent sexual assault cases, the vast majority of these incidents involved rape. Consistent with hypotheses, revictimization estimates among victims ranged from 52.7% for adolescents to 50% for college women and 58.8% for household-residing women. Estimates of revictimization appear to increase as a function of age with older household-residing women having had greatest opportunity for revictimization to occur when compared to adolescent or college respondents. However, samples are not directly comparable as the mean ages and age ranges of each sample vary. Nonetheless, high estimates of revictimization reported by adolescent, college, and household-residing participants highlight the importance of studying this topic across the lifespan.

Across all three representative samples, prevalence estimates of PTSD were higher among sexually revictimized participants when compared with singly victimized participants. Interestingly, PTSD estimates appear to be highest amongst revictimized college women, with 40% meeting criteria for PTSD in the preceding 6 months and nearly 60% meeting criteria for lifetime PTSD. Revictimized college women may have experienced more recent sexual victimization and thus, these higher estimates may reflect the fact that they are still in the midst of coping with this acute trauma. However, it is notable that 60% of revictimized college women met criteria for lifetime PTSD, perhaps suggesting a heightened vulnerability to experiencing psychopathology in the face of multiple stressors. Among revictimized adolescent girls and household-residing women, PTSD estimates also were notable, ranging from 20.0% to 45.3% depending on the assessment time frame. Estimates of past 6-month or lifetime PTSD among *single* assault victims were substantially lower, ranging from 13.4% for adolescent and household-residing victims to 32.0% for college victims. These findings have clinical implications in that screening for multiple victimization experiences, as opposed to only asking about presence or absence of sexual victimization, may enhance practitioners' abilities to focus on women most likely to be at risk for psychiatric problems. However, it is also important to note that even among revictimized women, a substantial proportion (~40% of revictimized college women, ~55% of revictimized household-residing women and ~72% of revictimized adolescents) do not report lifetime PTSD symptoms and an even greater proportion do not report current (past 6-month) PTSD. Thus, resiliency to PTSD in the wake of multiple sexual assaults is not uncommon, and studying factors that promote resilience among these groups may better inform PTSD treatment and revictimization prevention programs.

Revictimization consistently emerged as the strongest predictor of past 6-month and lifetime PTSD across all three samples when examined in relation to single victimization and participant age. Indeed, odds ratios suggested that revictimized adolescent, college, and household-residing women were between 5.1 and 6.7 times more likely to meet current PTSD criteria in comparison to non-sexually victimized women whereas singly victimized women were 2.5 to 3.3 times more likely to meet current PTSD criteria. Revictimized participants were 4.3 to 8.2 times more likely than non-victims to develop lifetime PTSD whereas single victims were only 2.4 to 3.5 times more likely to report lifetime PTSD when compared to non-victims. Older adolescents and younger household-residing women were more likely than younger adolescents and older household-residing women to endorse both lifetime and past 6-month PTSD. These findings suggest that older adolescence/early adulthood is a period associated with the greatest risk for PTSD, likely due to heightened risk of sexual victimization and revictimization faced by women in this age range²⁵. However, age did not significantly predict lifetime or past 6-month PTSD for college women, perhaps due to the homogeneous and narrow age range of college participants in this sample. Interestingly, exploratory analyses suggest that age, rather than the college environment itself, may be the more salient predictor of revictimization. More specifically,

early adulthood appears to be a developmental period during which women are at especially high risk for sexual revictimization, perhaps due to more frequent dating and social experiences that may not be unique to the college experience.

Sensitivity and specificity analyses suggested that the “true positive” rate of PTSD in association with any rape or sexual assault ranged from 30% to approaching 50% within the household probability sample, disproportionate to the prevalence of SV within each population which ranged from nearly 12% to 20%. Positive predictive power, or percent with PTSD among those who would be predicted based on positive screen, ranged from nearly 1 in 5 for current PTSD among those with any sexual violence within adolescent and household probability samples and 1 in 3 within the college sample to 1 in 4 within the adolescent sample to 45% within the household probability sample for lifetime PTSD. Among those who had experienced SV, revictimization provided additional useful information. While half of adolescent and college women and 58% of household probability sample women had experienced revictimization, sensitivity or true positive rate of PTSD was 57% and 62% for lifetime and current PTSD respectively in the adolescent sample and ranged from 65% to 74% in the other two samples indicating that two-thirds to three-fourths of PTSD cases occurred within the re-victimized subgroup. Among victims, the sensitivity associated with revictimization appears to increase with age. Similarly, associated PPP was relatively higher within college and household probability samples. These findings are consistent with the notion that these women may be more likely to have passed through the age ranges at highest risk for experiencing rape and revictimization if they are going to be exposed and thus, more information is available regarding revictimization and risk of PTSD within the older samples.

Overall, findings suggest that there may be predictive incremental value in screening women for rape experiences that are most likely to be associated with PTSD by: 1) assessing for any sexual victimization and 2) following affirmative responses with a query about revictimization. Although treatment approaches for PTSD symptoms emanating from single or multiple sexual assaults are not likely to be markedly different, a longer course of treatment may be useful in the case of revictimization, particularly if significant self-blame or safety concerns are present due to experiencing repeated victimization. Further, although responsibility for the assault lies solely with the perpetrator, victimized women may benefit from additional risk reduction strategies designed to help them identify risky situations, cope with distress in such situations, and respond assertively to risk cues to avoid further victimization. Indeed, PTSD symptoms have been suggested as a potential mechanism through which revictimization occurs²⁷; thus, identifying and treating these symptoms may be one means of reducing risk for additional victimization among those most at risk.

The findings presented here should be considered in the context of study limitations. First, respondents were asked whether they had experienced each type of unwanted sexual act once, twice, or three or more times and whether each incident was separate or part of an ongoing series of events. Although questions permitted women reporting separate acts that occurred twice or three or more times to be classified as revictimized, this approach did not permit analysis of the continuous number of victimizations experienced. Similarly, PTSD was assessed as a function of meeting criteria for the disorder either in the past 6-months or over the lifespan. Although this approach provides clinically useful data (particularly as functional impairment was included), our ability to explore the severity of PTSD symptoms was limited. Finally, although random digit dialing facilitates collection of representative data, participants without landlines may have been excluded; however, this concern is lessened by U.S. Census Bureau reports that 91% of participants in the age ranges of interest had landlines in 2005 and 2006. Nonetheless, future efforts should attempt to contact potential participants without phones or with cellular phones. Further, a proportion of girls

and women deemed eligible for each study chose not to participate and as such, we lack data to compare those who enrolled to those who declined participation on key study variables. However, the procedures used here are commonly utilized to generate representative data with the understanding that participant consent introduces an element of self-selection bias. Nonetheless, future efforts should be made to increase the response rates across studies of this kind.

Despite these limitations, the present study illuminated the role that sexual revictimization plays in predicting a debilitating psychiatric disorder among women from a variety of backgrounds. Revictimized college women, derived from a population typically considered relatively high-functioning, evidenced high prevalence of PTSD with functional impairment. These findings suggest the importance of developing and instituting evidence-based revictimization risk reduction programming in school and higher education settings. Further, results point to a strong need for practitioners working in student health clinics to assess revictimization experiences and treat psychiatric problems emanating from these incidents. Early detection and treatment of psychiatric problems resulting from sexual revictimization may help to alleviate the public health burden of such experiences by preventing additional victimization experiences and improving college adjustment and performance among victims experiencing functional impairment. A substantial proportion of revictimized adolescent and household-residing women also reported PTSD symptoms with functional impairment, suggesting the need to screen for victimization and assess PTSD symptoms among these groups as well. Medical and mental health providers working in school-based and community clinics, particularly those serving older adolescents and young adult women (e.g., Planned Parenthood Clinics), may wish to consider adding a small number of screening questions to standard assessment procedures to ensure that girls and women in need of services receive appropriate assessment and referrals. The use of sensitive, behaviorally specific screening questions similar to those used in the current studies is recommended to assess incidents consistent with definitions of sexual violence and rape related to multiple tactics including drug or alcohol facilitation and incapacitation²⁸. Such behaviorally specific approaches are more likely to accurately identify those who have had such experiences as opposed to use of labels such as rape which may be unclear in terms of meaning and which may detect cases that are most consistent with stereotypic characteristics (e.g., stranger assailant, presence of weapon, etc.), and that are not representative of all such cases.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Proportion of Adolescent, College, and Household-Community-Residing Victims Reporting Lifetime or Past 6-Month PTSD

	Lifetime PTSD	Past 6-month PTSD
Adolescent victims (<i>n</i> = 205)	26.6% (<i>n</i> = 53)	17.0% (<i>n</i> = 34)
Single victims (<i>n</i> = 97)	24.2% (<i>n</i> = 23)	13.7% (<i>n</i> = 13)
Revictimized (<i>n</i> = 108)	28.8% (<i>n</i> = 30)	20.0% (<i>n</i> = 21)
College victims (<i>n</i> = 250)	45.2% (<i>n</i> = 113)	30.8% (<i>n</i> = 77)
Single victims (<i>n</i> = 125)	32.0% (<i>n</i> = 40)	21.6% (<i>n</i> = 27)
Revictimized (<i>n</i> = 125)	58.4% (<i>n</i> = 73)	40.0% (<i>n</i> = 50)
Household-residing victims (<i>n</i> = 600)	37.0% (<i>n</i> = 222)	21.7% (<i>n</i> = 130)
Single victims (<i>n</i> = 247)	25.1% (<i>n</i> = 62)	13.8% (<i>n</i> = 34)
Revictimized (<i>n</i> = 353)	45.6% (<i>n</i> = 160)	27.2% (<i>n</i> = 96)

Table 2

Age-Adjusted Odds of Meeting Lifetime and Past 6-Month Criteria for PTSD by Victimization Type

Adolescent Girls (N = 1763)				
Variable	Lifetime PTSD (n = 164)		6-month PTSD (n = 93)	
	<i>Odd Ratio</i>	<i>95% C.I.</i>	<i>Odds Ratio</i>	<i>95% C.I.</i>
Single victimization (n = 149)	3.5 ^{***}	2.1, 5.8	3.3 ^{***}	1.7, 6.4
Revictimization (n = 47)	4.3 ^{***}	2.7, 6.9	5.1 ^{***}	2.9, 9.0
Age (M = 14.5 years)	1.2 ^{***}	1.1, 1.4	1.3 ^{***}	1.1, 1.4
College Women (N = 2000)				
Variable	Lifetime PTSD (n = 360)		6-month PTSD (n = 231)	
	<i>Odd Ratio</i>	<i>95% C.I.</i>	<i>Odds Ratio</i>	<i>95% C.I.</i>
Single victimization (n = 125)	2.8 ^{***}	1.9, 4.2	2.8 ^{***}	1.8, 4.4
Revictimization (n = 125)	8.2 ^{***}	5.6, 12.1	6.7 ^{***}	4.5, 9.9
Age (M = 20.1 years)	1.0	.99, 1.1	1.0	0.98, 1.1
Household-residing Women (N = 3001)				
Variable	Lifetime PTSD (n = 505)		6-month PTSD (n = 265)	
	<i>Odd Ratio</i>	<i>95% C.I.</i>	<i>Odds Ratio</i>	<i>95% C.I.</i>
Single victimization (n = 247)	2.4 ^{***}	1.7, 3.2	2.5 ^{***}	1.7, 3.8
Revictimization (n = 353)	5.9 ^{***}	4.6, 7.5	5.8 ^{***}	4.3, 7.8
Age (M = 46.6 years)	0.98 ^{***}	0.97, 0.98	0.96 ^{***}	0.95, 0.97

p <.001

Table 3

Adolescent Girls										
	Lifetime PTSD			Past 6-month PTSD			Past 6-month PTSD			
	Sensitivity	Specificity	PPP	NPP	Sensitivity	Specificity	PPP	NPP	PPP	NPP
Any vic vs non-vic	.32	.91	.27	.93	.37	.90	.17	.96		
Revic vs single vic	.57	.49	.29	.76	.62	.49	.20	.86		
College Women										
	Lifetime PTSD			Past 6-month PTSD			Past 6-month PTSD			
	Sensitivity	Specificity	PPP	NPP	Sensitivity	Specificity	PPP	NPP	PPP	NPP
Any vic vs non-vic	.31	.92	.45	.86	.33	.90	.31	.91		
Revic vs single vic	.65	.62	.58	.68	.65	.57	.40	.78		
Household-Residing Adult Women										
	Lifetime PTSD			Past 6-month PTSD			Past 6-month PTSD			
	Sensitivity	Specificity	PPP	NPP	Sensitivity	Specificity	PPP	NPP	PPP	NPP
Any vic vs non-vic	.44	.85	.37	.88	.49	.83	.22	.94		
Revic vs single vic	.72	.49	.46	.75	.74	.45	.27	.86		

Note: Any Vic = participants reporting any victimization; Non-vic = non-victimized participants; Revic = participants reporting at least two victimizations; single vic = participants reporting a single victimization