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Lifetime prevalence of gender-based violence in US women: Associations with mood/anxiety and substance use disorders

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Abstract

No population-representative US study has examined how lifetime exposure to gender-based violence (GBV) is related to a broad range of mood/anxiety and substance use disorders. The current study advances the literature by examining the relative contributions of developmental timing of earliest GBV exposure and amount of lifetime GBV exposure on risk for eight mood/anxiety and ten substance use disorders. Participants were 20,089 women from wave 2 (2004–2005) of the National Epidemiologic Survey of Alcohol and Related Conditions. Women reporting lifetime GBV (25%; $n = 5284$) had 3.6 and 2.5 times the odds of meeting lifetime mood/anxiety and substance use disorder criteria, respectively. Number of types and number of incidents of GBV were associated with risk for both types of disorders in a dose–response fashion; when examined simultaneously, number of types of GBV was the stronger predictor of mood/anxiety and substance use disorders. Relative to those who first experienced GBV during adulthood, first exposure during childhood and adolescence was associated with increased risk for mood/anxiety and substance use disorders. One in four women reported lifetime GBV, which had pernicious effects on mood/anxiety and substance use disorders, particularly for women who had experienced multiple types of GBV. The GBV effect varied by developmental period of exposure. Prevention of GBV is critical to reducing its burden. Among those exposed to GBV, clinicians should consider assessing a range of disorders and providing integrated treatment targeting multiple outcomes.

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Keywords

Gender-based violence; Mood/anxiety disorders; Substance use disorders; Developmental sequelae

1. Introduction

Gender-based violence (GBV) is an important global health and medical issue (Devries et al., 2013; Heise et al., 2002; Krug et al., 2002; Russo and Pirlott, 2006). GBV can occur in many forms, and has been broadly defined as including physical and sexual violence against women, as well as stalking (Rees et al., 2011). Using this definition, Australian studies have demonstrated strong associations between GBV and lifetime mental disorder and associated disability (Rees et al., 2011) as well as suicidal behavior (Rees et al., 2014). Although US studies have examined specific types of GBV [e.g., intimate partner violence (IPV)] in relation to selected negative health outcomes (Afifi et al., 2009), no US studies have examined associations between this broad GBV construct and a wide range of mood/anxiety and substance use disorders (SUDs).

Knowledge of the public health impact of GBV on US women has four major limitations. First, types of GBV co-occur (Clemmons et al., 2007; Edwards et al., 2003) but are seldom studied in combination. For example, Centers for Disease Control (CDC) data suggest that women often experience more than one type of GBV (Black et al., 2011); however many studies focus on one type (e.g., rape) without considering the effects of other types (e.g., physical violence) (Walsh et al., 2012). Focusing on single types of GBV may underestimate associations between GBV and negative outcomes, as Australian data indicate a dose–response relationship between exposure to multiple types of GBV and risk for mood/anxiety and SUDs (Rees et al., 2011).

A second limitation is that US studies have focused on GBV occurring only during specific timeframes, rather than assessing lifetime GBV that occurred during different periods including childhood *and* adulthood. For example, some studies have examined childhood adversity, including GBV, and risk for mood/anxiety (Chapman et al., 2007, 2004; Clemmons et al., 2007; Edwards et al., 2003; Green et al., 2010; Kessler et al., 2010; Phillips et al., 2005) and SUDs (Anda et al., 2002; Dube et al., 2002; Enoch, 2011; Keyes et al., 2011) without considering the influence of adult GBV exposure. The IPV literature often focuses on violence within a current romantic relationship (e.g., marriage), without considering how GBV earlier in life may contribute to mood/anxiety or SUDs (Afifi et al., 2012; Basile et al., 2004; Okuda et al., 2011). For example, the CDC IPV study only assessed violence occurring at age 11 or later (Black et al., 2011), but GBV can occur earlier. Individuals who are exposed to some forms of GBV in childhood are at increased risk for subsequent GBV (Walsh et al., 2012; Widom et al., 2008); thus, assessing GBV only during childhood, from adolescence onward, or within current adult relationships may overlook important information.

Third, little is known about whether GBV exposure during particular developmental periods is differentially associated with risk for particular types of outcomes. Cross-sectional studies

suggest that childhood adversity, including GBV, experienced early in life predicts maladaptive outcomes relative to violence experienced later in life, perhaps due to exposure during a critical developmental period (Manly et al., 2001). A neuroimaging study revealed differential effects of the timing of sexual abuse on various brain structures such that abuse during early childhood/adolescence was associated with reduced volume in the hippocampus (a brain region associated with memory and implicated in PTSD risk), while abuse during late adolescence was associated with diminished frontal cortex volume (a brain region associated with executive function and implicated in externalizing behaviors including substance abuse) (Andersen et al., 2008). These findings suggest that developmental age of GBV exposure is associated with distinct patterns of brain development that have been linked with different mental disorder phenotypes. Further, in a prospective longitudinal cohort of substantiated abuse cases and matched controls, earlier age of exposure to childhood abuse or neglect was associated with increased risk for adult depression and anxiety, while later exposure predicted more adult behavioral problems (Kaplow and Widom, 2007). However, evidence is mixed on the immediacy of mood/anxiety and SUD onset related to GBV exposure. Some studies indicate immediately increased risk for disorder onset (Turner et al., 2006), while other studies indicate more distal risk (e.g., stress sensitization due to effects of childhood exposure) (McLaughlin et al., 2011). No single study has examined whether risk for onset of mood/anxiety and SUDs varies by age of earliest exposure to GBV.

Fourth, most studies of GBV have focused on single, specific outcomes such as posttraumatic stress disorder (PTSD), and thus may have overlooked the broad public health impact of GBV on a wide range of mood/anxiety and SUDs. International studies have begun to illuminate associations between GBV and a wider range of important mood/anxiety and SUDs (Rees et al., 2011), but no nationally representative US studies have examined associations between GBV and a broad range of mood/anxiety and SUDs.

In summary, although US studies have focused on particular types of GBV occurring during specific timeframes and in relation to specific outcomes, no single study has examined associations between GBV during critical developmental periods and risk for a range of mood/anxiety and SUDs. We used data from female participants in the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) to address three specific aims. First, we documented the prevalence of GBV and its associations with lifetime mood/anxiety and SUDs in a nationally representative US sample of women. Second, we examined associations between level of GBV exposure (number of types and number of incidents) and earliest age of first GBV exposure in relation to lifetime mood/anxiety and SUDs. Third, we examined associations between developmental age of earliest GBV exposure and onset of mood/anxiety and SUDs during that same age and over the lifecourse.

2. Material and methods

2.1. Sample and procedures

Data were from 20,089 women who participated in wave 2 (2004–2005) of the NESARC, a face-to-face survey of non-institutionalized adults living in households and group quarters

(Grant et al., 2008; Hasin et al., 2007). The Wave 2 re-interview response rate among eligible Wave 1 participants was 86.7%, yielding a cumulative response rate over both waves of 70.2% (Grant et al., 2008). Young adults, Blacks, and Hispanics were oversampled; therefore, data were weighted to reflect the demographic characteristics of the US population based on the 2000 census (Grant et al., 2008). The study received full ethical approval from the US Census Bureau and the US Office of Management and Budget (Grant et al., 2008). The current study focused on women from the second wave as GBV was assessed only at that wave.

2.2. Measures

2.2.1. Gender-based violence—Respondents were asked about exposure to 23 potentially traumatic events including: sexual assault (“ever sexually assaulted, molested, raped, or experienced unwanted sex”); physical assault [three items assessing “physical attacks/beatings/injuries by: 1) a parent/caregiver before age 18, 2) a romantic partner, or 3) someone else”]; and stalking (“someone followed you or kept track of your activities in a way that made you feel you were in serious danger”). Individuals who responded affirmatively to any of these items were coded as experiencing lifetime GBV and asked follow-up questions about the number of times GBV occurred and their age when GBV first and most recently occurred. We examined three important characteristics of GBV: (a) number of types of GBV (1, 2, or 3); (b) number of occurrences of GBV (1, 2–3, 4–9, 10+ incidents); and (c) age of earliest exposure to GBV (2–10, 11–14, 15–17, 18–24, 25–34, 35–44, 45 or older). Because age of each GBV exposure was not assessed, we focused on earliest age of GBV exposure. We used age periods consistent with the CDC national IPV study (Black et al., 2011), but also included the developmental period prior to age 11 and separated adolescence into early and late adolescence, consistent with developmental studies (Andersen et al., 2008; Guttmanova et al., 2011).

2.2.2. Mood/anxiety and substance use disorders—The Alcohol Use Disorder and Associated Disabilities Interview, Schedule IV (AUDADIS-IV) was used to assess the following lifetime DSM-IV disorders: eight mood/anxiety disorders [PTSD, Social Phobia, Generalized Anxiety Disorder (GAD), Depression, Panic Disorder, Bipolar Disorder, Dysthymia, and Specific Phobia] and ten SUDs (alcohol, sedative, tranquilizer, opioid, amphetamine, cannabis, hallucinogen, cocaine, inhalant, and heroin). Among respondents who met lifetime criteria for a disorder, age of first episode onset, number of episodes, and age of most recent episode were ascertained. Because age of each episode was not assessed, we focused on risk of first episode onset by age of first GBV exposure. First episode onset was computed separately for mood/anxiety and SUDs, controlling for any onset of the same type of disorder at an earlier age. Test-retest reliability range from fair ($Kappa = 0.42$ for panic disorder) to excellent ($Kappa = 0.84$ for alcohol dependence) (Grant et al., 2003, 2004; Hasin et al., 1997; Ruan et al., 2008).

2.3. Statistical analysis

Analyses were conducted using SAS 9.3 (SAS Institute, Cary, NC). First, we examined the overall prevalence of GBV and its demographic correlates. Second, we used logistic regression to generate adjusted odds ratios (AORs) and 95% confidence intervals (CIs)

reflecting the likelihood of specific mood/anxiety and SUDs by any GBV exposure. Third, we examined the effects of experiencing multiple types and occurrences of GBV and earliest age of GBV on meeting lifetime criteria for mood/anxiety or SUDs. Fourth, we examined whether mood/anxiety and SUD incidence varies over the lifetime as a function of first exposure to GBV during particular developmental age periods. For these analyses, age at first GBV and age at first onset of mood/anxiety or SUDs were coded into the age groups noted above (2–10, 11–14, etc). Individuals with prior GBV or mood/anxiety/SUD onset were excluded from later age groups, allowing us to estimate the incidence of mood/anxiety and SUDs during each age period given first GBV at the same age compared to no GBV prior to or at that age. To examine immediate versus delayed effects of earliest GBV, we also estimated mood/anxiety and SUD incidence at age periods subsequent to first GBV. We excluded participants whose earliest GBV occurred after their first onset of mood/anxiety or SUDs. Bivariate analyses were weighted and multivariate analyses accounted for sample weight, clustering and stratification using Taylor series linearization to adjust for design effects of complex surveys.

3. Results

Demographic data are presented in Table 1. Mean age was 49.5 (SD = 17.7). Most respondents (70.6%) were Non-Hispanic white, 11.9% were African American, 10.9% were Hispanic, 4.2% were Asian or Pacific Islander, and 2.3% were American Indians or Alaska Natives. Women reporting GBV were more likely to be younger [$M = 45.5$ (SD = 14.6) vs 50.8 (SD = 18.4); $p < .0001$], Asian/Native Hawaiian/Pacific Islander or Hispanic, divorced, lower income, and college-educated when compared to women without GBV.

One-quarter ($n = 5284$) of women reported lifetime GBV; one, two, and all three types were reported by 72.0%, 21.9% and 6.0%, respectively. Of those with GBV, 1, 2–3, 4–9, and 10 or more incidents of GBV were reported by 33.6%, 22.2%, 15.3%, and 21.7%, respectively. In the whole sample, 14% ($n = 2900$), 14.7% ($n = 3203$), and 7.9% ($n = 1672$) experienced sexual violence, physical violence and stalking, respectively. Mean age of first sexual violence, physical violence, and stalking was 13.4 (SD = 8.2), 19.6 (SD = 10.0), and 26.9 (SD = 10.4), respectively.

Mean age of first GBV was 16.9 (SD = 10.4). Among those reporting GBV, 31.8% were first exposed prior to age 11, 13.3% between 11 and 14, 13.1% between 15 and 17, 25.5% between 18 and 24, 10.4% between 25 and 34, 4.3% between 35 and 44, and 1.7% at 45 or older. Of the sample, 47% met criteria for any mood/anxiety disorder (mean age of onset = 17.1, SD = 14.4), and 24.7% met criteria for any SUD (mean age of onset = 21.8, SD = 8.4).

3.1. GBV and lifetime mood/anxiety and SUDs

Table 2 presents associations between any GBV and lifetime mood/anxiety and SUDs. After adjusting for age, race, education, income, and marital status, women reporting any GBV had 3.62 times the odds of a mood/anxiety disorder and 2.46 times the odds of a SUD compared to women unexposed to GBV.

3.2. Level of GBV exposure and lifetime mood/anxiety and SUDs

Table 3 presents associations between level of GBV exposure and lifetime mood/anxiety and SUDs. Model 1 considers a single exposure variable (types or incidents), while Model 2 simultaneously examines the influence of number of types and incidents. Those who reported more types of GBV had increased odds of mood/anxiety and SUDs, a dose–response effect (Model 1 in Table 3). Similarly, exposure to more GBV incidents was associated with increasingly greater odds of mood/anxiety and SUDs, also a dose–response effect (Model 1 in Table 3). Model 2 revealed that number of GBV types was the stronger predictor of mood/anxiety and SUDs.

3.3. First GBV exposure and lifetime mood/anxiety and SUDs

Compared to women who first experienced GBV at age 45 or older, women whose earliest GBV occurred between 35 and 44 had more than twice the odds of a lifetime mood/anxiety disorder and odds increased for each younger age period to more than 18 times the odds of a lifetime mood/anxiety disorder for earliest GBV between 2 and 10 (Table 3). Similarly, women who first experienced GBV between 18 and 24 had 3.6 times the odds of a lifetime SUD and odds increased for younger age periods such that those who first experienced GBV between ages 2–10 had 8.5 times the odds of a lifetime SUD.

3.4. First GBV exposure and onset of mood/anxiety and SUDs

Next, we tested whether developmental period of first GBV was associated with increased risk for mood/anxiety or SUD onset during that same period as well as disorder incidence at later ages. Associations between age of first GBV and age of mood/anxiety disorder onset are shown in Table 4. Earliest GBV during any age period was strongly associated with mood/anxiety disorder onset during the same period, and the magnitude of associations with disorder incidence at later periods decreased over time.

Associations between age of first GBV and age of SUD onset are shown in Table 5. Earliest GBV was generally associated with elevated risk for SUD onset at the same age period. First GBV during childhood also was associated with incident SUDs over the lifecourse.

4. Discussion

One in four women in this US nationally representative sample reported any lifetime exposure to gender-based violence (GBV). Any GBV was associated with a 2.5–3.6 fold elevated risk of developing a mood/anxiety or SUD. Number of types and number of incidents of GBV were significantly associated with mood/anxiety and SUDs, although number of types of GBV was the stronger predictor of both disorder types. Although earlier GBV exposure was associated with increased risk for both mood/anxiety and SUDs, women who first experienced GBV between 2 and 10 had more than 18 times the odds of developing a lifetime mood/anxiety disorder.

The finding that one in four women reported any GBV is similar to the World Health Organization estimate that 23.2% of women in high-income regions of the Americas have experienced violence (Devries et al., 2013). College-educated women were more likely to

experience GBV, which may reflect the high risk for exposure to sexual or dating violence on college campuses (Koss et al., 1987); more educated women also may be more willing to report GBV. The dose-response relationship between amount of GBV exposure and risk for psychopathology is consistent with previous research (e.g. (Basile et al., 2004; Rees et al., 2011) but extends prior work by demonstrating that experiencing more types of GBV is a stronger predictor of a wide range of mood/anxiety and SUDs when compared to number of GBV incidents.

GBV exposure in childhood appears to have especially pernicious effects on risk for lifetime mood/anxiety and SUDs. Onset analyses corroborated these findings by revealing persistent effects of first GBV during childhood on mood/anxiety and SUD incidence over the lifecourse. Analyses also revealed strong immediate effects of first GBV at any age period on incidence of mood/anxiety and SUDs at that same age period, which is consistent with Australian studies showing a strong immediate effect of GBV on mental disorder incidence, particularly PTSD (Rees et al., 2014). The effect of first GBV exposure on both mood/anxiety and SUD onset generally remained significant but waned in magnitude by middle adulthood, when risk for disorder onset had largely passed. Consistent with work suggesting that adolescence is a high-risk period for exposure to GBV and the onset of psychopathology (Rees et al., 2011), first GBV between 11 and 14 was associated with a more than 6-fold increase in the incidence of SUDs. Both findings suggest that adolescent GBV is a potent risk factor for the onset of adolescent psychopathology; preventing GBV during this period should be an important focus of mental disorder prevention efforts. The majority of women who developed a SUD reported onset between age 18-25; however, first GBV prior to 18 was strongly associated with SUD onset before age 18, suggesting that early GBV may contribute to accelerated SUD onset. First GBV after age 45 was associated with a five-fold increase in SUD onset; thus, GBV appears to contribute to atypical SUD onsets.

Limitations of the current study should be noted. First, age and amount of GBV exposure and age at onset of mood/anxiety and SUDs were assessed via retrospective recall, which may have introduced bias. Although an older study found that retrospectively recalled, but not prospectively monitored, childhood abuse was significantly associated with adult drug abuse (Widom et al., 1999), a more recent study comparing retrospectively recalled childhood abuse to prospective monitoring of substantiated abuse cases revealed no difference in the magnitude of association with mood, anxiety, and drug use disorders (Scott et al., 2010). Thus, recent data suggest that retrospective approaches are informative, particularly with respect to the full range of disorders assessed here. Second, we only collected data on age of first and most recent GBV exposure; thus, we were unable to examine associations between amount of GBV during particular developmental periods and negative outcomes. Third, GBV was assessed with five screening questions about various types of GBV; more nuanced approaches using multiple behaviorally specific questions about each type of GBV may yield higher prevalence estimates. Fourth, although participants were asked about stalking experiences, the current study did not assess all forms of psychological abuse that constitute violence against women (e.g., name-calling, denying access to money/economic support, threatening physical violence to loved ones, damaging property). Had these forms of psychological violence been assessed, prevalence estimates

for GBV exposure may have been higher than those observed here. Fifth, although several common mood/anxiety and SUDs were examined, some disorders that may be associated with GBV (e.g., obsessive compulsive disorder, eating disorders) were not assessed; future studies should consider assessing these conditions. Despite these limitations, this investigation had several important strengths including the large, nationally representative sample, the broad assessment of various mood/anxiety and SUDs, and the measurement of multiple aspects of GBV including number of incidents and age of first exposure.

Findings suggest several important preventative and clinical implications. First, GBV is clearly a prevalent problem facing women worldwide that is not limited to low-middle income countries or those engaged in conflict (Devries et al., 2013). Second, preventing repeated GBV exposure and exposure to multiple types of GBV may reduce the public health burden of mood/anxiety and SUDs. Prevention requires that victims report GBV. To encourage reporting, stigma surrounding GBV exposure must be reduced and confidentiality must be protected. To achieve these goals, shifting negative societal opinions of women is critical. Third, despite existing prevention programs for various types of GBV in the US, there is limited evidence that prevalence has declined (Finkelhor and Jones, 2006), suggesting a substantial unmet need for more effective prevention efforts. Focusing prevention on perpetrators rather than victims may yield greater reductions in GBV. Fourth, although the developmentally specific results observed for different disorder types should be replicated, our findings comport with other studies observing increased risk for GBV and mental disorder onset in adolescence (Rees et al., 2011), and suggest that adolescence is a critical period for mental disorder prevention efforts. Better understanding the developmental sequelae of GBV may enable clinicians to tailor early intervention programs to more effectively mitigate the detrimental effects of GBV. Finally, the current results suggest that GBV is associated with a range of negative outcomes. Clinicians working with violence-exposed women should assess multiple disorders and consider implementing evidence-based treatments that cut across conditions (Danielson et al., 2012; Mills et al., 2012).

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Table 1
Descriptive characteristics for NESARC women overall and with and without GBV exposure.

Ethnicity/Race	Total sample (N = 20,089)		GBV ^a (n = 5284)		No GBV (n = 14,643)	
	N	%	N	%	N	%
White	11,308	70.6	3070	70.1	8151	72.4
Black	4261	11.9	1136	11.8	3098	12.3
American Indian	338	2.3	130	2.0	204	3.3
Asian/Pacific Islander	542	4.2	90	4.8	436	2.2
Hispanic	3640	10.9	858	11.3	2754	9.8
Marital status						
Married	9499	57.5	2135	50.5	7295	60.0
Living together	588	2.9	219	4.5	368	2.4
Widowed	2765	11.2	397	5.9	2318	12.8
Divorced	2905	10.6	1240	18.6	1650	7.9
Separated	787	2.7	330	4.6	449	2.1
Never married	3545	15.1	963	15.9	2563	14.9
Educational attainment						
Less than high school	3249	13.9	741	12.4	2458	14.3
High school/GED	5553	27.8	1360	25.8	4151	28.5
College or beyond	11,287	58.3	3183	61.8	8034	57.2
Income						
0–20K	5513	22.3	1516	28.7	3932	26.9
20–40K	5306	25.2	1467	27.8	3789	25.9
40–100K	7747	43.1	1949	36.9	5763	39.4
100K+	1523	9.4	352	6.7	1159	7.9

SD = standard deviation.

^a GBV = Gender-based violence.

Table 2

Prevalence and adjusted odds ratios^a of mood/anxiety and substance use disorders among women with and without GBV^b exposure.

	No GBV N (%)	GBV N (%)	GBV AOR (95% CI)
Any mood/Anxiety disorder	5721 (38.7%)	3770 (71.6%)	3.62 (3.46, 3.79)
PTSD	985 (6.5%)	1658 (31.3%)	6.19 (5.82, 6.58)
Social phobia	789 (5.6%)	769 (15.1%)	2.63 (2.45, 2.82)
Generalized anxiety	994 (7.0%)	985 (19.4%)	2.86 (2.71, 3.02)
Depression	3028 (20.7%)	2501 (47.9%)	3.10 (2.95, 3.25)
Panic	756 (5.4%)	738 (14.1%)	2.60 (2.43, 2.77)
Bipolar	422 (2.6%)	352 (6.5%)	2.09 (1.90, 2.29)
Dysthymia	566 (3.5%)	700 (14.1%)	3.92 (3.58, 4.29)
Specific phobia	2379 (16.2%)	1565 (30.3%)	2.09 (1.97, 2.21)
Any substance use disorder	2688 (19.2%)	2118 (41.4%)	2.46 (2.35, 2.58)
Alcohol	2467 (17.7%)	1883 (36.9%)	2.25 (2.14, 2.36)
Sedative	52 (0.3%)	119 (2.3%)	4.96 (3.71, 6.62)
Tranquilizer	52 (0.4%)	113 (2.2%)	3.80 (3.02, 4.79)
Opioid	97 (0.6%)	173 (3.6%)	4.52 (3.96, 5.16)
Amphetamine	100 (0.7%)	208 (4.5%)	5.07 (4.11, 6.26)
Cannabis	535 (3.9%)	638 (12.8%)	2.84 (2.61, 3.10)
Hallucinogen	62 (0.5%)	121 (2.9%)	4.58 (3.85, 5.45)
Cocaine	155 (0.9%)	281 (5.4%)	4.50 (4.02, 5.04)
Inhalant	8 (0.06%)	23 (0.4%)	6.13 (3.82, 9.82)
Heroin	13 (0.09%)	27 (0.4%)	2.77 (2.11, 3.63)

^a Adjusted for demographics (age, ethnicity/race, education, income, marital status).

^b GBV = Gender-based violence.

Table 3

Lifetime Mood/Anxiety and Substance Use Disorders by level of GBV^a exposure (Number of Types, Number of Incidents), and Age at First GBV Exposure.

	Any mood/Anxiety disorder (n = 9536)		Any substance use disorder (n = 4818)	
	Adjusted odds ratios ^b			
	Model 1 ^c	Model 2 ^d	Model 1 ^c	Model 2 ^d
Number of GBV types – count	2.46 (2.39, 2.54)	1.95 (1.86, 2.03)	1.75 (1.70, 1.80)	1.48 (1.41, 1.56)
0 (n = 14,805)	REF ^e	REF	REF	REF
1 (n = 3257)	2.84 (2.69, 2.99)	3.07 (2.60, 3.64)	2.07 (1.96, 2.20)	1.81 (1.52, 2.14)
2 (n = 1523)	5.12 (4.80, 5.46)	4.55 (3.85, 5.37)	3.06 (2.88, 3.25)	2.39 (2.01, 2.84)
3 (n = 482)	13.89 (11.47, 16.80)	11.43 (9.07–14.40)	4.33 (3.80, 4.92)	3.28 (2.65, 4.05)
Number of incidents -count	1.65 (1.62, 1.68)	1.18 (1.15, 1.21)	1.38 (1.36, 1.40)	1.13 (1.10, 1.16)
0 (n = 14,805)	REF	REF	REF	REF
1 (n = 1490)	2.29 (2.16, 2.43)	0.76 (0.64, 0.89)	1.89 (1.76, 2.03)	1.06 (0.88, 1.27)
2–3 (n = 1167)	3.37 (3.14, 3.62)	0.93 (0.79, 1.09)	2.41 (2.26, 2.58)	1.19 (1.004,1.41)
4–9 (n = 903)	4.08 (3.76, 4.44)	1.05 (0.88, 1.25)	2.60 (2.36, 2.86)	1.22 (1.02, 1.46)
10+ (n = 1313)	6.30 (5.76, 6.90)	1.49 (1.26, 1.76)	3.29 (3.03, 3.58)	1.46 (1.23, 1.74)
Age of earliest GBV:				
2–10	18.19 (9.73, 34.01)		8.49 (3.10, 22.54)	
11–14	9.34 (4.90, 17.98)		8.21 (3.02, 22.30)	
15–17	7.52 (4.02, 14.09)		7.23 (2.68, 19.48)	
18–24	4.23 (2.25, 7.96)		3.56 (1.29, 9.79)	
25–34	2.54 (1.34, 4.74)		2.07 (0.75, 5.68)	
35–44	2.20 (1.21, 4.00)		0.93 (0.29, 2.98)	
45+	REF		REF	

^a GBV = Gender-based violence.

^b All models were adjusted for demographics (age, ethnicity/race, education, income, marital status).

^c Model 1 includes number of types or number of incidents plus covariates.

^d Model 2 includes both number of types and number of incidents plus covariates.

^e REF = Reference category.

Table 4Age at onset of mood/anxiety disorder by age of first GBV^a exposure.

Mood/Anxiety onset at age:		2-10 (n = 3758)	11-14 (n = 980)	15-17 (n = 832)	18-24 (n = 1137)	25-34 (n = 984)	35-44 (n = 573)	45+ (n = 492)
Adjusted odds ratios (95% confidence interval)								
Earliest GBV at age:	2-10 (n = 1339)	3.40 (3.10, 3.73)	4.39 (3.98, 4.84)	3.47 (3.07, 3.92)	2.59 (2.24, 3.00)	3.22 (2.84, 3.66)	2.06 (1.84, 2.31)	1.78 (1.32, 2.41)
	11-14 (n = 436)	–	6.70 (5.92, 7.59)	2.19 (1.83, 2.63)	2.53 (2.14, 2.98)	3.05 (2.45, 3.79)	1.22 (0.88, 1.69)	2.73 (2.05, 3.62)
	15-17 (n = 369)	–	–	6.04 (5.15, 7.10)	2.94 (2.52, 3.44)	1.91 (1.51, 2.42)	3.99 (3.11, 5.12)	1.32 (0.93, 1.88)
	18-24 (n = 707)	–	–	–	3.76 (3.29, 4.29)	1.82 (1.59, 2.09)	2.40 (2.05-2.80)	2.08 (1.62-2.68)
	25-34 (n = 319)	–	–	–	–	2.88 (2.26-3.67)	2.94 (2.27-3.81)	1.28 (1.18-1.39)
	35-44 (n = 117)	–	–	–	–	–	4.54 (3.06-6.73)	2.71 (2.06-3.57)
	45+ (n = 57)	–	–	–	–	–	–	2.16 (1.16-4.04)

– Not estimated.

Bold indicates that the odds ratio and corresponding 95% CI were significant.

^a GBV = Gender-based violence; models controlled for age, ethnicity/race, education, income, marital status.

Table 5

Age at onset of substance use disorder by age of first GBV^a exposure again.

SUD onset at age:	2-10 (n = 17)	11-14 (n = 195)	15-17 (n = 856)	18-24 (n = 1905)	25-34 (n = 645)	35-44 (n = 255)	45+ (n = 132)
Adjusted odds ratios (95% confidence intervals)							
Earliest GBV at age:	2-10 (n = 1509)	4.66 (3.89, 5.59)	2.77 (2.40, 3.19)	2.00 (1.81, 2.21)	3.04 (2.70, 3.43)	1.44 (1.04, 1.99)	3.08 (1.88, 5.03)
	11-14 (n = 612)	6.19 (4.79, 8.01)	3.48 (2.82, 4.29)	1.64 (1.42, 1.90)	2.24 (1.74, 2.89)	1.86 (1.30, 2.66)	1.27 (0.79, 2.03)
	15-17 (n = 582)	—	3.39 (2.75, 4.16)	2.22 (1.89, 2.61)	2.62 (2.14, 3.22)	3.04 (2.33, 3.96)	1.18 (0.74, 1.89)
	18-24 (n = 1005)	—	—	1.33 (1.15, 1.55)	2.33 (1.94, 2.79)	1.75 (1.32, 2.32)	2.08 (1.49, 2.91)
	25-34 (n = 443)	—	—	—	2.24 (1.97, 2.55)	3.20 (2.41, 4.25)	3.39 (2.51, 4.56)
	35-44 (n = 178)	—	—	—	—	2.50 (0.95, 6.59)	2.50 (1.69, 3.68)
	45+ (n = 89)	—	—	—	—	—	5.02 (1.88, 13.38)

- Not estimated.

^a GBV = Gender-based violence; models controlled for age, ethnicity/race, education, income, marital status.