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Victimization, Smoking, and Chronic Physical Health Problems Among Sexual Minority Women

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Abstract

Background—Sexual minority women (SMW) have been shown to be at increased risk for abuse, smoking, and chronic physical health problems compared with heterosexual women. In the general population, abuse and smoking are associated with physical health problems. However, there has been little research on their associations among SMW.

Purpose—The current study examined a mediational model of abuse, smoking, and self-reported physical health conditions in a national sample of SMW.

Methods—Participants (*N*=1,224) were recruited via the Internet and completed measures of childhood trauma, adult sexual assault, smoking, body mass index, and chronic medical conditions.

Results—Structural equation modeling demonstrated that childhood abuse was associated with adult sexual assault, smoking, and physical health problems, but smoking was not a significant mediator.

Conclusions—The results highlight the impact of childhood abuse on physical health problems among SMW and the need to examine other health behaviors that may mediate this relation.

Keywords

Lesbian; Bisexual; Physical health; Abuse; Smoking

Introduction

Accumulating evidence has suggested that compared with heterosexuals, sexual minorities are at increased risk for psychological distress and mental health problems [1–5]. There has been considerably less research on physical health disparities among lesbian, gay, and bisexual individuals and less focus specifically on sexual minority women (SMW). The limited data available suggest that SMW are a medically underserved population [6] at risk for health disparities, including higher rates of cardiovascular disease [7–9] and diabetes [10, 11]. Data from the California Quality of Life Survey showed that SMW reported a

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greater variety of health conditions and limitations compared with heterosexual women, including digestive complaints, back problems, chronic fatigue syndrome, asthma, and arthritis [12].

More research has documented SMW's greater likelihood to be obese, defined as a body mass index (BMI) of over 30. Obesity is considered a medical condition that may lead to reduced life expectancy and increased risk for major health problems such as cancer or heart disease; in fact, higher body weights are associated with increases in all-cause mortality [13]. A review of 19 articles that included measures of both obesity and sexual orientation determined that SMW were more likely than heterosexual women to be obese [14]. A recent study suggested that lesbians were 2.69 times more likely to be overweight and 2.47 times more likely to be obese [15].

To our knowledge, only a couple of studies to date have examined risk factors that may explain these adverse physical health outcomes among SMW. One study found an association between childhood sexual abuse and obesity among lesbians [16] and another, a link between sexual and physical assault and physical health concerns among Native American SMW [17]. Among heterosexual women, a history of childhood abuse and adult victimization has been linked to physical health consequences, including chronic conditions and obesity [18–21].

Given that SMW are at a particularly increased risk for both childhood and adulthood victimization, these may be important and understudied risk factors that may account for physical health problems in this population. Indeed, studies have consistently found higher risk of child maltreatment, including emotional, physical, and sexual abuse, among lesbian, gay, and bisexual people compared with heterosexuals [22–25]. Studies of sexual assault in adulthood also consistently find higher rates among SMW compared with heterosexual women [23, 25–27].

One potential mediator that may explain the link between past victimization and disease is smoking. Smoking is related to a number of health problems; it is the leading cause of preventable death in women and increases risk for heart disease and chronic respiratory conditions [28]. Moreover, some data suggest that childhood sexual abuse is related to smoking in women in general [29]. Thus, this may be a particularly important factor to consider when examining the association between victimization and disease. Notably, smoking rates are significantly higher among SMW compared to heterosexual women [30, 31].

In the current study, our overall goal was to examine relationships among childhood abuse, adult sexual assault, smoking, and chronic physical health problems in a large national Internet sample of SMW. We hypothesized that childhood abuse would be a significant predictor of adult sexual assault, which would in turn significantly predict smoking. In turn, we predicted that smoking would be adversely related to chronic physical health problems.

Method

Procedures

Data were collected via a web-based Internet survey according to standard procedures [32–34]. Participants were recruited using a combination of snowball and targeted sampling. Study fliers were sent electronically to over 200 listservs, web site groups, and various organizations serving the lesbian, gay, and bisexual community in all 50 states. All participants were asked to forward information about the study to others who might be interested and eligible to participate. In addition, given that bisexual women and lesbian, gay, and bisexual people of color are more difficult to recruit, specific advertising targeted to these populations was sent to sites and listservs focused on these groups; examples include yahoo groups, email lists specifically for bisexual women or people of color, and Craig's list.

Participants who followed the study link were taken to an information statement that described the purpose of the study (i.e., "to better understand the specific experiences of lesbian, gay, and bisexual women"); requirements for participation (age 18 years or older; biologically born female; identification as lesbian, gay, bisexual, queer, or two-spirit; living in the USA); risks and benefits; and a confidentiality agreement. Participants who agreed to participate then completed the questionnaire online, which was followed by a listing of lesbian, gay, and bisexual and mental health resources. Those who completed the survey could voluntarily enter a drawing to win one of five US $50 prizes.

Measures

Survey measures relevant to the current study included questions covering demographics, childhood abuse, adult sexual assault, smoking, and chronic physical health problems. The measures selected were psychometrically sound and widely used in the field.

Demographics—Using standard formats, we assessed participants' age; sex; sexual orientation self-identity (i.e., lesbian, gay, bisexual, queer, two-spirit, or other); race/ethnicity; education; income; years self-identified as lesbian, gay, or bisexual; and area of residence.

Childhood Abuse—The Childhood Trauma Questionnaire was used to determine histories of abuse and neglect [35]. With 28 items, it inquires about five types of maltreatment: emotional, physical, and sexual abuse, and emotional and physical neglect. Each item is scored on a five-point scale from 1 (*never true*) to 5 (*always true*), with higher scores indicating more abuse, and the items were averaged to calculate an overall score. The Childhood Trauma Questionnaire has good reliability, internal consistency, and has demonstrated high convergence with the Childhood Trauma Interview [36]. Scoring guidelines indicate four abuse classifications for each scale: none or minimal, low to moderate, moderate to severe, and severe to extreme. In order to calculate the prevalence rates in the current study, we classified any score above the "none or minimal" range as indicating abuse, as recommended by the authors of the Childhood Trauma Questionnaire [37].

Adult Sexual Assault—Three items were included from the Sexual Experiences Survey to assess sexual assault [38]. The items use behaviorally specific language to assess unwanted sex acts, asking participants how many times someone had oral; vaginal (i.e., inserted their fingers, objects, or penis into vagina); or anal (i.e., inserted their fingers, objects, or penis into butt) sex with them without their consent since their 14th birthday.

Smoking—We assessed smoking with three items from the Washington State Behavioral Risk Factor Surveillance System [39]. The items assessed whether the participant had smoked at least 100 cigarettes in her life (*yes/no*), current smoking (*every day*, *some days*, or *not at all*), and whether the participant had attempted to quit smoking within the past 12 months (*yes/no*).

Chronic Physical Health Problems—We assessed whether a participant had ever been told by a doctor or other health professional that she had any of the following medical conditions: arthritis, diabetes, heart disease, chronic respiratory condition, hypertension, and high cholesterol. These items were summed (yes=1, no=0) to arrive at the total number of conditions a participant reported. In addition, we also assessed participants' self-reported height and weight to arrive at a BMI, a good indicator for obesity [13]. BMI was calculated as weight (kilograms) divided by height (meter) squared.

Analytic Plan

To examine associations among the variables, we performed path analysis using structural equation modeling (SEM) with Mplus statistical modeling software, version 5.2 [40].

Missing data on the main study variables ranged from 1% to 9%. In order to retain as much data as possible, SEM analyses used full-information maximum likelihood estimation [41]. Model fit to the sample data was assessed through the recommended two-step procedure [42]. First, a measurement model was tested with all paths left free to vary. Then, a hypothesized structural path model was tested wherein childhood abuse was regressed on adult victimization, which was in turn regressed on smoking, which was regressed on self-reported chronic physical health problems. As has been noted in the literature, the chi-square statistic tends to be affected by large sample sizes and is almost always significant despite reasonable fit to the data [43, 44]. Therefore, as suggested by Byrne [44], several alternative indexes of fit were used as adjuncts to the chi-square statistic, including the comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Indicators of acceptable model fit are considered to be a CFI and TLI>0.90, RMSEA <0.06, and SMRM<0.08 [45, 46]. We utilized a multivariate approach examining multiple indices of model fit, model parameter estimates, residuals, and relative fit indices (such as chi-square difference testing) to arrive at the optimal model.

Results

Sample Description

The 1,244 participants ranged in age from 18 to 86 years (*M*=33.77, SD=12.24). Forty-five percent identified as lesbian, 5% as gay, 29% as bisexual, 17% as queer, 2% as two-spirit, and 3% as other. The average amount of years women identified as lesbian, gay, or bisexual was 13.95 (SD=11.22). Seventy-six percent identified as White, 6% African American, 4% Latina, 4% Asian, 1% American Indian, 9% multiracial, and 1% other. Most had a Bachelor's degree or more advanced education (59%), and the median individual annual income was US $20,000–$29,000. Women participated from all 50 states of the USA, with 45% residing in a large city, 25% in a medium-sized city, 18% in a small city, 4% in a rural area, and 8% in a suburb.

Preliminary Analyses

Descriptive statistics and bivariate correlations for the main study variables are presented in Table 1. The childhood abuse variables were highly positively correlated, and moderate strength correlations were found among measures of adult sexual assault. Indicators of abuse were moderately associated with smoking and health-related outcomes in the expected direction. However, smoking indicators were generally not correlated with physical health problems and BMI. Age and education were moderately correlated with the main study variables, as expected, including childhood abuse, adult assault, smoking, self-reported chronic conditions, and BMI. Thus, all subsequent SEM analyses controlled for age and education.

Using the Childhood Trauma Questionnaire cutoff scores, 59% of respondents indicated emotional abuse, 35% physical abuse, 40% sexual abuse, 61% emotional neglect, and 41% physical neglect in childhood. With regard to the prevalence of adult sexual assault, 40% reported at least one incidence since the age of 14. In particular, 23% reported adult oral sexual assault, 34% reported adult vaginal sexual assault, and 12% reported adult anal sexual assault. Experiencing any childhood abuse increased one's risk for experiencing at least one incident of adult sexual assault; of those women meeting the criteria for abuse or neglect on any of the five childhood abuse scales, 45% went on to experience at least one incident of adult sexual assault, as opposed to 20% of those not reporting childhood abuse or neglect ($\chi^2(1)=46.11$, $p<0.01$).

Forty-six percent of the women in the sample indicated that they had smoked at least 100 cigarettes (equivalent to five packs) in their lifetime. Currently, 23% indicated smoking, with 10% reporting that they smoke some days and 13% every day. Twenty-two percent indicated that they had attempted to quit smoking in the past year. Of the women who indicated attempts to quit, 66% reported still currently smoking.

With regard to BMI, 22% of the sample met criteria for being overweight (BMI=25–29.9) and 33% for being obese (BMI>30). Thus, over half of the sample weighs above what is recommended (overall *M*=28.06, SD=7.68). Additionally, 33% reported being told by a doctor or health professional that they had at least one of the six chronic physical health conditions assessed. In particular, 21% had one condition, 7% two of the conditions, 3%

three of the conditions, and the remaining four or more. Across the whole sample, 16% reported having arthritis, 4% diabetes, 2% heart disease, 4% chronic respiratory condition, 12% hypertension, and 16% high cholesterol.

Additionally, we compared women who identified as lesbian/gay, bisexual, or other on the main study variables. While no significant differences emerged with regard to childhood abuse and smoking, women identifying as lesbian/gay reported less adult sexual assault (35%) compared with bisexual women (42%) and women identifying as other (46%; $\chi^2(2)=10.42$, $p<0.01$). Additionally, ANOVA's and post hoc Tukey's tests showed that women identifying as other reported a lower BMI ($M=26.65$, SD=6.88) than both lesbian/gay women ($M=28.32$, SD=7.77, $p=0.01$) and bisexual women ($M=28.65$, SD=7.99, $p<0.01$); they also reported fewer chronic physical health problems ($M=0.29$, SD=0.79) than lesbian/gay women ($M=0.65$, SD=1.00, $p<0.001$) and bisexual women ($M=0.53$, SD=0.89, $p<0.01$).

Path Model

Latent variables were formed for childhood abuse, comprising the means of the emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect subscales of the Childhood Trauma Questionnaire; for adult sexual assault, comprising the oral, vaginal, and anal sexual assault items from the Sexual Experiences Survey; for smoking, comprising the three items on lifetime smoking, current smoking, and attempts to quit; and for chronic physical health problems, comprising the BMI (as a continuous variable) and the sum of the six medical conditions assessed (ranging from 0 to 6). The latent factors were allowed to freely correlate in a preliminary model. The model demonstrated acceptable fit ($\chi^2(59)=331.84$, $p<0.05$, CFI=0.95, TLI=0.93, SRMR=0.04, RMSEA=0.06, 90% confidence interval on RMSEA= 0.05–0.07). Factor loadings for the indicators of each latent variable were significant and >0.50.

SEM was used next to test the theoretical model that childhood abuse would predict adult sexual assault, which would in turn predict smoking, which would in turn predict chronic physical health problems, while controlling for age and education. The resulting model (not shown) fit the data adequately ($\chi^2(80)=496.19$, $p<0.05$, CFI=0.93, TLI=0.90, SRMR=0.06, RMSEA=0.06). All hypothesized paths were significant, with the exception of smoking on physical health ($\beta=0.05$, $z=1.41$, $p=0.12$). Inspection of the modification indices revealed potential areas of misfit and suggested the estimation of an additional path from childhood abuse to smoking. The model was re-run after this path was left to vary, demonstrating a significantly better fit ($\chi^2(79)=474.64$, $p<0.05$, CFI=0.93, TLI=0.91, SRMR=0.05, RMSEA=0.06, $\Delta\chi^2(1)=21.55$, $p<0.001$). Like the previous model, all paths were significant, with the exception of smoking on physical health ($\beta=0.05$, $z=1.53$, $p=0.13$); additionally, the path from adult sexual assault to smoking was no longer significant ($\beta=0.06$, $z=1.44$, $p=0.15$). Modification indices did not indicate any other areas of potential misfit.

Because smoking did not predict physical health, two alternative models were tested wherein this path was no longer estimated and, instead, adult sexual assault and childhood abuse directly predicted self-reported chronic physical health problems. In the first model, only adult sexual assault was left free to vary on physical health; this fits the data adequately

($\chi^2(78)=472.14$, $p<0.05$, CFI=0.93, TLI=0.91, SRMR=0.05, RMSEA=0.06), with the additional new path from adult sexual assault onto physical health demonstrating significance ($\beta=0.07$, $z=2.04$, $p=0.04$). In the second model, childhood abuse was also left free to vary on physical health ($\chi^2(77)=466.89$, $p<0.05$, CFI=0.93, TLI=0.91, SRMR=0.05, RMSEA=0.06). Chi-square difference testing demonstrated that this final model (shown in Fig. 1) fit the data significantly better than the previous two (ps<0.01), and thus, it was considered the final model.

In this final model, childhood abuse directly predicted adult sexual assault, smoking, and self-reported chronic physical health problems. Adult sexual assault no longer predicted smoking and physical health problems once controlling for childhood abuse. The model accounted for 39% of the variance in self-reported chronic physical health problems, 13% of the variance in smoking, as well as 16% of the variance in adult sexual assault.

Discussion

The current study examined factors that may account for chronic physical health problems among SMW. Participants reported significant levels of physical health conditions, with a third being told by a doctor or health professional that they had at least one of six chronic conditions, the majority being high cholesterol and arthritis. In addition, the majority of the sample weighed above recommended levels, with 22% meeting criteria for overweight and 33% for obesity. Nearly a quarter of the sample reported that they currently smoked.

Participants reported high levels of abuse as children, with rates of 35–59% depending on the type. Experiencing childhood abuse or neglect increased risk for adult sexual assault. However, the original hypothetical model, wherein adult sexual assault and smoking serve as mediators linking childhood abuse with chronic physical health problems, was not supported. While adult sexual assault initially predicted both smoking and physical health, these paths became non-significant when the paths between childhood abuse and these variables were left free to vary. Rather, childhood abuse was a significant predictor of adult sexual assault, smoking, and self-reported chronic physical health problems. This suggests both childhood abuse's tenacious impact on later life health problems, beyond revictimization experiences, and underscores the need to understand the mechanisms through which this relationship operates.

Interestingly, smoking was not associated with the self-reported chronic health conditions assessed. One possibility is that several health consequences of smoking, including cancers and stroke, were not assessed. It is also possible that these associations were not detected because our sample was relatively young (M age=33.77, SD=12.24). Nonetheless, it will be important for future research to examine other potential mechanisms linking childhood abuse with chronic physical health conditions in this population. For example, alcohol use has been associated with both childhood abuse [47] and physical health problems [48] among women. Other psychosocial factors, such as stigma and minority stress, should also be examined for their role in exacerbating health disparities.

Despite its lack of association with self-reported physical health problems, smoking was significantly associated with childhood abuse. This in itself has important implications. In the general population, relationships have been reported between traumatic stress during childhood and smoking [49, 50]. In this study, childhood abuse had a similarly significant effect on smoking (β=0.20) as did education (β=−0.25). Additionally, the results are also consistent with findings from studies of women in the general population demonstrating links between childhood abuse and obesity [51]. And similar to other studies, including one among lesbians [16, 21], this association was independent of demographic characteristics.

The current study has several limitations. First, the design is cross-sectional, and thus, no causality can be inferred. Longitudinal data are becoming increasingly recognized as important when testing mediation and paths across time [52]; thus, it is important to examine these hypotheses with more than one time point. In addition, the survey took place over the Internet; as a result, we cannot generalize the results to all SMW, nor do we know how the participants may differ in any systematic way from those who did not see our recruitment materials or chose not to participate. Finally, the measures used were based on self-report and thus are subject to participant misunderstanding or biased responding. For example, regarding physical health problems, future research should either use objective sources, if available, or follow-up items with more specific questions to ensure accuracy [53].

This study incorporates novel design elements that address several limitations of previously published work. The study included a large sample of SMW, allowing us to use advanced statistical techniques to test a theoretical model of abuse and chronic physical health problems. We used measures with established psychometric properties of childhood abuse and adult sexual assault using behaviorally specific language. Moreover, we examined a comprehensive model that incorporated abuse experiences in both childhood and adulthood, health behaviors (i.e., smoking), and physical health conditions that, while based on self-report, indicated diagnosis by a physician or other health professional.

In conclusion, the results of this study provide strong support for the impact of abuse, childhood abuse in particular, on several adverse outcomes, including smoking, an array of medical conditions and obesity. As obesity and health care costs continue to rise, it is imperative to continue developing and refining prevention programs. Discussion about how lesbian, gay, and bisexual communities and health providers serving them can successfully manage health behaviors in the face of traumatic history and experiences is critical. As we continue to examine predictors and mechanisms that account for physical health disparities among vulnerable populations, prevention interventions must develop innovative programs that promote active health engagement with an awareness of the social context that may create barriers or place individuals at risk.

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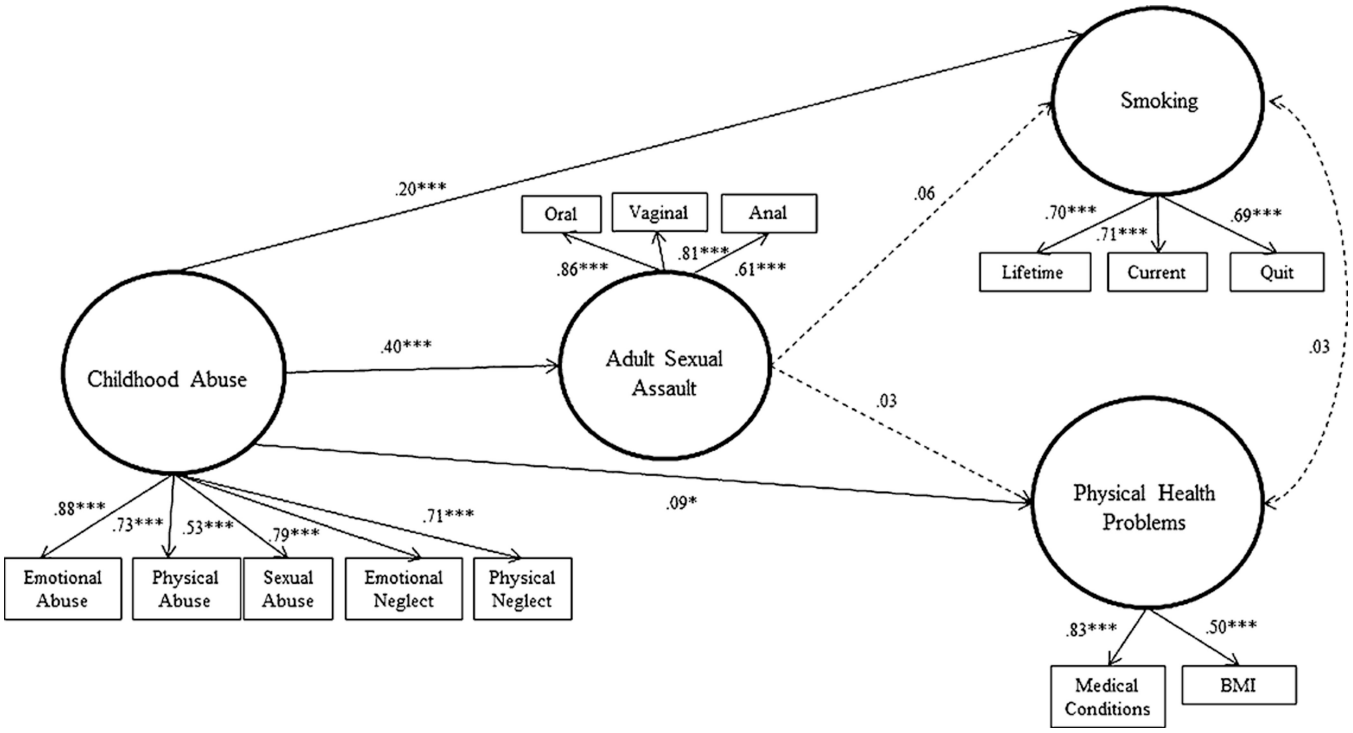

Fig. 1.

Path model and standardized path coefficients for final model. Paths estimated in the model that are not pictured in figure: age on childhood abuse (β=0.17, z=5.64, p<0.001) and physical health problems (β=0.62, z=19.54, p<0.001), and education on childhood abuse (β=−0.17, z=−5.51, p<0.001), smoking (β=−0.25, z=−7.41, p<0.001), and physical health problems (β=−0.20, z=−6.04, p<0.001). The paths between age on adult sexual assault, age on smoking, and education on adult sexual assault were non-significant. *p<0.05; **p<0.01; ***p<0.001

Table 1

Descriptive statistics and correlations among main study variables for sexual minority women

Variable	Perentage	*M*	SD	Range	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Child EA[a]	59	2.26	1.12	1–5	0.89														
2. Child PA[a]	35	1.60	.89	1–5	0.88	0.65***													
3. Child SA[a]	40	1.67	1.14	1–5	0.96	0.45***	0.44***												
4. Child EN[a]	61	2.37	1.03	1–5	0.92	0.72***	0.51***	0.34***											
5. Child PN[a]	41	1.56	0.68	1–5	0.74	0.59***	0.54***	0.40***	0.62***										
6. Oral[b]	23					0.29***	0.26***	0.33***	0.19***	0.20***									
7. Vaginal[b]	34					0.32***	0.26***	0.35***	0.19***	0.23***	0.69***								
8. Anal[b]	12					0.25***	0.18***	0.27***	0.16***	0.16***	0.54***	0.49***							
9. Lifetime[c]	46					0.18***	0.14***	0.18***	0.17***	0.09**	0.06*	0.13***	0.09**						
10. Current[d]	23					0.17***	0.16***	0.17***	0.13***	0.13***	0.08**	0.12***	0.09**	0.50***					
11. Quit[e]	22					0.15***	0.13***	0.11***	0.09**	0.08**	0.08**	0.09**	0.07*	0.50***	0.48***				
12. Conditions[f]	33	0.53	0.94	0–6	0.56	0.12***	0.13***	0.21***	0.14***	0.10***	0.07**	0.10***	0.11***	0.16***	0.04	0.00			
13. BMI		28.06	7.68	16–71		0.20***	0.20***	0.18***	0.15***	0.12***	0.06*	0.03	0.02	0.07*	0.01	0.01	0.40***		
14. Age		33.77	12.24	18–86		0.12***	0.14***	0.20***	0.19***	0.08*	0.07*	0.08**	0.07*	0.18***	−0.08**	−0.08**	0.49***	0.25***	
15. Education[g]		4.98	1.73	1–7		−0.14***	−0.13***	−0.14***	−0.11***	−0.15***	−0.04	−0.06*	−0.08**	−0.11***	−0.26***	−0.19***	0.06	−0.07*	0.32***

N = 1,113–1,233 due to pairwise deletion of missing data

EA emotional abuse, *PA* physical abuse, *SA* sexual abuse, *EN* emotional neglect, *PN* physical neglect

* $p<0.05$;

** $p<0.01$;

*** $p<0.001$

[a] Percentages based on cutoff scores and indicate a positive case of abuse or neglect

[b] Defined as oral, vaginal, or anal assault since the age of 14 years and, for correlations, scored as continuous variables depending on frequency of assault (0 for *never*, 1 for *once*, 2 for *twice*, 3 for *three or more times*)

[c] Percentage indicates whether ever smoked at least 100 cigarettes. For correlations, scored 0 for *no*, 1 for *yes*

[d] Percentage indicates current smokers. For correlations, assessed by whether smoke every day (3), some days (2), or not at all (1)

[e] Indicates whether attempted to quit smoking within the past year (0 for *no*, 1 for *yes*)

[f] Mean represents the average number of chronic physical health conditions from the six assessed, including arthritis, diabetes, heart disease, chronic respiratory condition, hypertension, and high cholesterol

[g] 1 = some or no high school, 2 = high school degree, 3 = some college, 4 = associate's degree, 5 = bachelor's degree, 6 = some graduate school, 7 = advanced degree