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History of abuse and its relationship to pain experience and depression in women with chronic pelvic pain

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Abstract

Objective—To determine the relationship between a history of physical or sexual abuse, pain experience and depressive symptoms among women with chronic pelvic pain (CPP).

Study Design—Cross-sectional study of women who presented to tertiary referral center for evaluation of CPP (N=273). All participants completed standardized questionnaires to assess a history of physical or sexual abuse, pain severity, pain disability, and depressive symptoms. Subjects were grouped by abuse category and compared to CPP participants without history of abuse. Multinomial logistic regression models were used to determine the association between adult and childhood physical or sexual abuse with pain intensity, pain-related disability, and depressive symptoms.

Results—Logistic regression analyses indicated that, after controlling for age and education, none of the abuse categories was associated with pain severity. However, adult sexual abuse

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predicted greater pain-related disability (odds ratio 2.39, 95% CI 1.05 – 5.40), while both adult physical and sexual abuse were associated with higher levels of depression (both $p < .05$). Level of education was significantly associated with pain intensity, pain disability, and depression.

Conclusion—For our sample of women with CPP, a history of abuse during childhood or adulthood was not associated with differences in pain intensity, but adult sexual abuse was associated with greater pain-related disability. A history of physical abuse or sexual abuse appears to hold a stronger relationship with current depressive symptoms than pain experience for women with CPP. Educational achievement holds a robust relationship with pain morbidity and depression for this population.

Keywords

chronic pelvic pain; depression; educational achievement; physical abuse; sexual abuse

Introduction

Many women with chronic pelvic pain (CPP) suffer from pain-related disability without a definitive medical diagnosis.^{1,2} Early clinical reports asserted a causal role for childhood sexual abuse in explaining persistent pelvic pain in the absence of a definitive diagnostic workup.^{3,4} Later comparative studies found a high rate of sexual abuse among women with CPP^{4–7} and in comparison to women without pelvic pain.^{8,9} Evidence from community-based surveys further strengthened the perceived association between a history of sexual or physical abuse and a higher prevalence of pain complaints among women with CPP.¹⁰ Recently, Fenton¹¹ proposed a model of limbic sensitization as a mechanism for explaining CPP without obvious medical etiology that invoked childhood sexual abuse as a primary trigger for the development of a reverberating cycle of pain and central nervous system sensitization.

More recently, a number of critical reviews have questioned the empirical evidence for a specific and direct association between abuse history and the development of CPP.^{12–15} These authors note that the majority of relevant studies fail to adequately control for potential confounding factors, such as the presence of chronic pain, in considering the association of abuse history and CPP. For example, only two previous studies examining the relation of CPP and abuse have included a non-abused sample of CPP patients as a control, and both found no differences between the groups for pain severity.^{16, 17} Further, when women with CPP are compared with other chronic pain populations for a history of abuse, the results have been equivocal or negative for observing comparatively more severe pain experience for women with CPP who have been abused.^{5,7,18}

A second methodological criticism of this literature concerns the lack of clarity for case definition across studies.^{14,19} The issue of case definition is important as a history of abuse as a risk factor for pain can vary in terms of the type and timing of abuse (e.g., sexual versus physical, childhood versus adult), and these dimensions of abuse are frequently collapsed in analyses which questionably assumes heterogeneity across groups.¹⁹ Moreover, childhood sexual or physical abuse rarely occur in isolation from other forms of abuse or severe family

disturbance during childhood,^{20, 21} and childhood abuse is known to significantly predict adulthood abuse.²²

This study examined the association between a history of abuse and pain experience and depressive symptoms among women with CPP. The study compared sample of women with CPP and a history of abuse to women with CPP with no history of abuse, thus controlling for the influence of chronic pain and pain diagnosis on the relation between a history of abuse and both pain and depressive symptoms. To further examine any differences due to timing and type of abuse, history of abuse was stratified across four categories: childhood versus adulthood, and sexual versus physical abuse and each subcategory was compared to CPP patients without a history of abuse. In addition, a measure of depressive symptoms was included as a variable of interest due to previous evidence suggesting an association between CPP and depression^{23–26} and to determine whether women with CPP who have experienced various types of abuse report more severe depressive symptoms.

Materials and Methods

Participants ($N = 273$) comprised a convenience sample of consecutive women with chronic pelvic pain seen for evaluation and treatment in a university hospital chronic pelvic pain referral clinic between March 2006 and September 2007. The mean age of the sample was 34.8 years ($SD=11.3$). Participants had a mean duration of pain of 67.6 months ($SD = 86.2$). The sample included a heterogeneous group of women with a combination of various pain disorders including but not limited to endometriosis, adenomyosis, pelvic adhesions, ovarian remnants, vulvodynia, interstitial cystitis, irritable bowel syndrome, abdominal and pelvic floor myofascial pain.

Prior to the first appointment, a packet of questionnaires was mailed to the participant and collected at the evaluation appointment. Participants received the questionnaires as part of routine medical care. The packet included both a general questionnaire soliciting relevant sociodemographic information (e.g., age, marital status, educational achievement) and medical history, in addition to standardized inventories that assessed pain experience, depressive symptoms and a history of abuse. The number of patients who reported chronic pelvic pain but did not receive or declined to complete the questionnaire as part of their routine medical care was not recorded in the medical record. The study was approved by the University of Michigan Medical School Institutional Review Board.

To assess pain experience, subjects completed the Brief Pain Inventory short form (BPI-SF),²⁷ a self-administered questionnaire that assesses pain severity and functional interference from persistent pain. Subjects are asked to rate the severity of their pain and the degree to which pain interferes with a variety of life activities during the past week. The BPI-SF provides 2 summary measures of pain experience: 1) subjective rating of pain intensity and (BPI Severity, range 0–10) and 2) pain interference (BPI Interference, range 0–10) which is defined as the degree to which a subject reports functional and activity-related disability attributed to pain. Higher scores indicate more severe pain intensity and pain interference. Several studies support the validity of the BPI-SF for a heterogeneous group of chronic pain patients.²⁸

Participants also completed the Center for Epidemiological-Depression Scale (CES-D),²⁹ an inventory that examines self-reported mood and behavior during the previous week. Higher scores (range 0–60) indicate greater depressive symptoms. Internal consistency of the CES-D is .85 for the community and .90 in a patient population.²⁹ The CES-D possesses good validity for predicting major depression in a chronic pain population.³⁰

A history of sexual and/or physical abuse was obtained from the Sexual and Physical Abuse History Questionnaire, a standardized screening measure previously validated with a chronic pelvic pain population.^{31,32} Physical Abuse is defined as incidents separate from sexual abuse indicating a life threatening physical attack with intent to kill or seriously harm, or less severe physical assaults such as being beaten, kicked, bit or other attacks outside of normal parenting or interpersonal engagement. Sexual abuse is defined as the touching of private body parts by a perpetrator, making the subject similarly touch the perpetrator, or making the subject have vaginal or anal intercourse, with these actions occurring within a context of threat or harm. For individual items, separate prompts are used to assess abuse in childhood or adulthood. Separate measures are calculated for the physical abuse and sexual abuse scores, and both measures are stratified into childhood and adult age brackets: 13 or younger, and 14 or older, respectively. Test-retest reliability coefficients for both the physical abuse (0.81) and sexual abuse (0.77) scales are high, and the measures demonstrate adequate construct validity.³² In the present study, abuse was categorized as having occurred or not occurred (e.g., non-abused) if a subject endorsed any (or no) item in each category.

Statistical Analyses

Group differences were examined separately for the BPI Pain Severity, BPI Pain Interference, and CES-D scores by the various groups with a history of abuse compared to subjects who reported no history of abuse. The abuse categories were arranged in a 2×2 design, with the dimensions of history of physical abuse and history of sexual abuse each divided into childhood and adulthood groups. Independent samples t-tests were used to examine whether mean differences between the group comparisons were statistically significant. A correction was made to the test when the sample variances were not equivalent.

Multinomial logistic regressions were conducted to examine the relative contribution of each type of history of abuse to the prediction of pain intensity, pain interference, and depressive symptoms. Age and level of education were entered as control variables along with the 4 types of abuse. As the use of logistic regression requires categorization of the dependent variables, BPI Severity pain scores were categorized in relation to those subjects with no pain (0), mild or moderate pain (>0–6.99), compared to severe pain (7 or greater).³³ To examine differences in pain-related disability, a median split was performed of the BPI Interference scale (the median was 5). For depression, we examined the incidence of clinically significant depression on the CES-D in each abuse category, defined as a score of 16 or greater.²⁹ Low scores were coded as 1 and treated as the reference category, whereas high scores were coded as 0. Presence of history of abuse in any category was coded as 0, while absence of abuse was coded as 1 and treated as the reference category. The overall model fit of each regression was assessed using a chi-square test, which examines whether

the model with predictors fits better as a whole compared to a model with no predictors. The significance of the contribution of each type of abuse to the dependent variable was assessed using the Wald test statistic. Adjusted odds ratios, along with 95% confidence intervals, are also reported.

Results

Of the 273 total subjects, a subset had missing data on the questionnaires. Missing responses varied by the particular measure examined. Therefore, the sample sizes are reported in the tables along with the mean and standard deviation of each sample. For the regressions, the total sample size is reported in the footnote. The characteristics of the sample are reported in Table 1. The frequency of each category of abuse in the sample ranged from 23.8% to 32.6%.

The means, sample sizes, and standard deviations of the BPI Severity scores, BPI Interference scores, and CES-D depression scores for each of the abuse groups compared to their non-abused cohorts, are reported in Tables 2, 3, and 4, respectively. There was no difference in pain severity scores when comparing CPP patients with a history of abuse relative to those without a prior history of abuse (Table 2). However, women with CPP and a history of physical abuse as an adult reported significantly higher pain-related disability (BPI Interference) when compared to patients reporting no abuse in these categories ($t(225) = 1.99, p < .05$, Table 3). Furthermore, women with CPP who reported a history of child physical abuse ($t(240) = 2.68, p < .01$) or child sexual abuse ($t(234) = 3.52, p < .01$) reported significantly more depressive symptoms compared to respondents who reported no history of child abuse in these categories (Table 4). The findings were similar for those reporting history of adult abuse, as patients reporting a history of physical abuse ($t(243) = 4.25, p < .001$) or sexual abuse ($t(236) = 3.86, p < .001$) both reported significantly more depressive symptoms compared to persons reporting no history of abuse in these categories.

Multinomial logistic regression models were used to evaluate the influence of a history of abuse on pain severity, pain-related disability, and depression, while controlling for age and educational level. When considering any adult abuse compared to CPP without prior history of abuse, any childhood abuse compared to CPP without prior abuse, or any form of abuse (either adult or childhood) compared to CPP without prior abuse, the combined effects of abuse were not significantly associated with pain severity, pain-related disability, or depression (data not shown). However, when considering the individual impact of each abuse subcategory on pain severity, pain-related disability, and depression, all model fits were statistically significant (Tables 5, 6, and 7). For example, Table 5 presents the logistic regression analysis examining the influence of type of abuse history on pain severity, controlling for age and educational level. Overall, the model fit was statistically significant ($X^2(6) = 26.9, p < .001$). Education was the only variable significantly associated with pain severity in an inverse fashion ($p < .001$). History of adult sexual abuse was marginally associated with a higher likelihood of having severe pain ($p = .082$), although this did not reach statistical significance.

With dichotomized BPI Interference as the dependent measure, the model fit was again statistically significant ($X^2(6) = 19.5$, $p = .003$, Table 6). Both age and education were significant predictors of being in the high pain interference group, with persons of younger age and lower education being more likely to report higher levels of pain-related disability ($p = .04$ and $p = .0009$, respectively). Of the abuse categories, only history of adult sexual abuse was significantly associated with high pain-related disability ($p = .04$). Subjects with a history of adult sexual abuse were 2.39 (95% CI 1.05 – 5.40) times more likely to have high pain-related disability compared to subjects without a history of adult sexual abuse.

Lastly, Table 7 displays the logistic regression with low or clinically significant depression as the outcome categories. Again, the model fit was statistically significant ($X^2(6) = 32.5$, $p < .001$). Level of education was significantly related to depression category, with persons having lower education being more likely to be in the group with significant depressive symptoms ($p < .001$). Both history of adult sexual abuse ($p = .02$) and history of adult physical abuse ($p = .02$) significantly predicted having clinically significant depressive symptoms. Persons with a history of adult sexual abuse were 2.55 (95% CI 1.17 – 5.58) times more likely to have clinically significant depressive symptoms compare to persons with no history of abuse, while persons with a history of adult physical abuse had a relative risk of 2.51 (95% CI 1.15 – 5.47).

Comment

A main finding of this study is the failure to confirm a relationship between a history of childhood abuse (i.e., either physical or sexual) and pain severity in adult women with CPP. Our findings are discrepant from a number of previous studies that have found a relation between childhood sexual and physical abuse and adult pain experience^{7,34} and thus should be interpreted with caution. This failure to replicate may be related to a number of methodological limitations. By stratifying our sample into 4 discrete abuse categories, the composite sample size was thereby reduced which may have compromised the power of our analysis to determine a true significant association between the various abuse variables and self-reported pain severity. In addition, variability in sample composition or measurement differences in the assessment tools utilized to measure pain and abuse history across our and previous studies may also explain inconsistent results across related investigations. However, it is possible that these differences from some of the prior studies are due to our study design that incorporated a non-abused CPP sample which allowed us to assess the specific association of abuse history and persistent pain among women with CPP. Our findings are in line with similar investigations that have incorporated a CPP control group^{16,17}, and challenge one common clinical inference that purports a causal relationship between a history of childhood abuse in explaining “enigmatic” CPP.

Controlling for chronic pain in studies examining a specific relation between CPP and abuse is necessary as a history of abuse is highly prevalent among a heterogeneous population of chronic pain patients, with estimates varying from 45–65%.³⁵ In a healthy community sample, a history of childhood abuse is associated with multiple pain sites including head pain and musculoskeletal pain in addition to pelvic pain.^{36,37} Consistent with our findings, women with CPP do not report more severe pain experience when compared to other

(nonpelvic) chronic pain populations with a comparable history of abuse.^{5,7,18} Thus, the observed association between childhood abuse and CPP reported in previous research may be more parsimoniously understood to reflect an association between abuse and chronic pain experience in general rather than reflecting a specific (e.g., causal) relation to pelvic pain.¹⁴

Rather than childhood abuse as a significant covariate of pain in CPP, our data point to the importance of proximal (e.g., adulthood) abuse history as more pertinent to pain morbidity in these women, and that adult abuse appears to be differentially related to pain disability more so than pain intensity (although we did observe a marginal relation of adult sexual abuse and pain severity). Our finding of an association between adult history of abuse and self-reported pain-related disability may reflect the influence of trauma and the development of symptoms of posttraumatic stress disorder (PTSD) among abused women with CPP.³⁸ PTSD is known to be associated with greater pain-related disability among persons with chronic pain,³⁹ and is also associated with severity of abuse among a sample of CPP patients.³⁸ It remains unclear why the other categories of abuse assessed in this study were not associated with disability due to pain, particularly given the evidence for their relation with PTSD.⁴⁰ One possible explanation is that trauma in adulthood, and its recent impact, might contribute more strongly to current PTSD symptoms than traumatic abuse experienced early in life. Collectively, these findings encourage future studies that examine the relationship of abuse history and CPP to obtain multiple measures of both abuse history and pain morbidity as different types of abuse may be differentially related to different dimensions of chronic pain in this population.

Our finding that adult sexual abuse is associated with more severe depressive symptoms replicates previous reports of an association between a history of abuse and depression in general,⁴¹ abuse and depression among chronic pain patients⁴² and, more specifically, among women who have been abused and suffer with CPP.⁷ These findings have important implications for the study of the relationship of abuse history and CPP, beyond the obvious concern for the mental health of these women. Among chronic pain patients in general, depression is known to enhance pain morbidity by contributing to more severe pain experience and pain-related disability, and has been found to compromise pain treatment outcome for persons with chronic pain.^{43,44} This may explain why a history of adult sexual and physical abuse was associated with reports of more severe disability attributed to pain for our sample, implicating a possible mediating role for depressive symptoms in explaining the relationship between adult abuse and pain disability. However, empirical studies to date have failed to establish this relational role for depressive symptom^{13,45}, and the relationship between chronic pain and depression is likely highly complex. For example, recent literature suggests that depression and chronic pain may share common, but not entirely overlapping neurobiological underpinnings.⁴⁶ Regardless, the relationship between depression and pain experience continues to be a major focus of chronic pain studies, and further investigation of this association among women with CPP is warranted.⁴⁷

Lastly, our finding of a robust association for level of education with both pain measures and depressive symptoms coincides with an emerging literature on the influence of socioeconomic status in understanding persistent pain^{48, 49} and comorbid depression among persons with chronic pain.⁵⁰ The role of socioeconomic factors in explaining clinical pain is

consistent with a biopsychosocial model of pain that understands pain experience as an interactive and integrative sum of biological, psychological and social factors.⁵¹ Accumulating evidence suggests that social factors such as level of education may be important in understanding pain-related morbidity in women with CPP. Recently, Roth and colleagues⁵² reported that educational achievement was inversely related to pain intensity, somatic preoccupation, severity of emotional suffering and pain-related disability for women attending treatment for CPP. Similarly, Martin et al.⁵³ found a significant association between educational achievement and pain intensity for women with endometriosis-related CPP. These data highlight the need for pain practitioners who care for women with CPP to adopt a biopsychosocial paradigm, including attention to relevant socioeconomic parameters, in their evaluation and management of patients with CPP.

This study has several important implications for the care of women with CPP. The results suggest caution when attributing the origin of CPP that defies a clear association with medical pathology to a history of abuse, particularly if the abuse history is limited to childhood physical or sexual abuse. However, our data suggest that among women with CPP, a history of adult sexual abuse is highly associated with pain-related disability, with these women being more than twice as likely to report severe levels of disability relative to women without a history of abuse. Moreover, we found that a history of sexual abuse and physical abuse, whether in childhood or particularly in adulthood, held a robust relationship with severity of depressive symptoms, suggesting that any history of abuse is a greater risk factor for mood disturbance than pain morbidity for this population. These results point to the need to actively assess a history of abuse and the presence of depressive symptoms for women seeking pain intervention for CPP, as these factors may be useful in understanding why some women with CPP report such high levels of pain and disability. As demonstrated in other chronic pain syndromes, the directed treatment of current comorbid psychological disturbance associated with a history of adult abuse or an active depressive disorder may be necessary and crucial to the adequate management of the morbidity associated with CPP.⁴⁶

This study has several methodological limitations. First, the study design is cross-sectional and the statistical analyses are correlational, thus no direction of causality among the significant associations reported can be ascertained. Second, this study was conducted in a tertiary care referral setting, where the subject pool would be expected to present with relatively more severe clinical morbidities.⁵⁴ As a result, the present findings may differ from previous studies due to sampling differences, particularly for those deriving from a community-based or primary care setting. In addition, our data acquisition relied on patient self-report measures that are susceptible to methodological constraints associated with factors that distort self-report estimations of clinical functioning in general⁵⁵ and the report of abuse history more specifically.⁵⁶ Moreover, while we categorized our patients into discrete abuse categories based on the type and timing of their abuse histories, clinical experience suggests that many women suffer multiple types of abuse episodes over time.²⁰ Our study design did not permit examination of possible cumulative effects of abuse for women who may have suffered abuse in more than one of the categories we identified. Thus, our quantification of abuse history for this sample may not accurately reflect the breadth and complexity of each woman's experience of abuse or its impact on pain and depressive symptoms.

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Table 1

Sample Characteristics

Variable	Mean $\pm$ SD or Frequency (%)
Age (years)	34.8 $\pm$ 11.3
Marital Status	
Single	97 (35.5)
Married	139 (50.9)
Divorced	23 (8.4)
Other	14 (5.2)
Educational Level (percent)	
< High School	4
High School Graduate	17
Some College	36
Associate Degree	13
Bachelor's Degree	16
Post-Graduate Training	14
BPI Pain Composite	4.95 $\pm$ 2.3
BPI Interference Composite	4.95 $\pm$ 3.0
CES-D Total Score	17.0 $\pm$ 11.5
History of Child Physical Abuse	65 (23.8)
History of Child Sexual Abuse	77 (28.2)
History of Adult Physical Abuse	81 (29.7)
History of Adult Sexual Abuse	89 (32.6)

Table 2

Means, Sample Sizes, and Standard Deviations of Brief Pain Inventory (BPI) Pain Severity Composite Scores for Patients Reporting Abuse Compared to Patients Reporting No Abuse

Category of Abuse	BPI Pain Severity	
	Abuse (n, SD)	No Abuse (n, SD)
Physical Abuse-Child	5.08 (57, 2.30)	4.91 (167, 2.31)
Physical Abuse-Adult	5.15 (71, 2.37)	4.86 (155, 2.27)
Sexual Abuse-Child	5.09 (69, 2.38)	4.95 (148, 2.27)
Sexual Abuse-Adult	5.17 (75, 2.36)	4.83 (143, 2.30)

Table 3

Means, Sample Sizes, and Standard Deviations of Brief Pain Inventory (BPI) Interference Composite Scores for Patients Reporting Abuse Compared to Patients Reporting No Abuse

Category of abuse	BPI Pain Interference	
	Abuse (n, SD)	No Abuse (n, SD)
Physical Abuse-Child	5.01 (56, 3.10)	4.98 (168, 2.90)
Physical Abuse-Adult *	5.54 (70, 2.88)	4.70 (157, 2.95)
Sexual Abuse-Child	5.12 (67, 3.01)	4.92 (151, 2.91)
Sexual Abuse-Adult	5.43 (76, 3.14)	4.78 (143, 2.84)

Note: *p < .05.

Table 4

Means, Sample Sizes, and Standard Deviations of Depressive Symptoms for Patients Reporting Abuse Compared to Patients Reporting No Abuse

Category of abuse	CES-D	
	Abuse (n, SD)	No Abuse (n, SD)
Physical Abuse-Child*	20.82 (61, 13.77)	15.68 (181, 10.28)
Physical Abuse-Adult*	21.46 (77, 11.56)	14.96 (168, 10.88)
Sexual Abuse-Child*	20.93 (73, 20.93)	15.37 (163, 10.68)
Sexual Abuse-Adult*	21.16 (83, 12.38)	15.01 (155, 10.31)

Note: * $p < .01$.

Table 5

Multinomial Logistic Regression Examining the Influence of Type of Abuse on High Pain Severity Controlling For Age and Educational Level.

Variable	B	Wald	p-value	aOR	CI
Age	-.03	2.81	.09	0.97	0.93–1.01
Education	-.67	15.77	<.001	0.51	0.37–0.71
History of Child Physical Abuse	-.57	1.20	.27	0.57	0.20–1.57
History of Child Sexual Abuse	-.22	0.18	.67	0.80	0.29–2.24
History of Adult Physical Abuse	.34	0.46	.50	1.40	0.53–3.68
History of Adult Sexual Abuse	.90	3.03	.08	2.45	0.89–6.73

Note: Sample size was 210. B – regression coefficient, aOR – adjusted odds ratio, CI – 95% confidence interval for the odds ratio.

Table 6

Multinomial Logistic Regression Examining the Influence of Type of Abuse on High Pain Interference Controlling For Age and Educational Level.

Variable	B	Wald	p-value	aOR	CI
Age	-.03	4.41	.04	0.97	0.94–1.0
Education	-.29	6.84	.009	0.75	0.61–0.93
History of Child Physical Abuse	-.20	0.24	.63	0.82	0.37–1.82
History of Child Sexual Abuse	-.55	1.64	.20	0.58	0.25–1.34
History of Adult Physical Abuse	.55	1.91	.17	1.73	0.80–3.74
History of Adult Sexual Abuse	.87	1.35	.04	2.39	1.05–5.40

Note: Sample size was 209. B – regression coefficient, aOR – adjusted odds ratio, CI – 95% confidence interval for the odds ratio.

Table 7

Multinomial Logistic Regression Examining the Influence of Type of Abuse on Clinically Significant Depression Controlling For Age and Educational Level.

Variable	B	Wald	p-value	OR	CI
Age	-.01	0.15	.70	1.00	0.97–1.02
Education	-.40	13.77	<.001	0.67	0.55–0.83
History of Child Physical Abuse	-.29	0.50	.48	0.75	0.33–1.69
History of Child Sexual Abuse	-.08	0.04	.84	0.92	0.41–2.07
History of Adult Physical Abuse	.92	5.39	.02	2.51	1.15–5.47
History of Adult Sexual Abuse	.94	5.51	.02	2.55	1.17–5.58

Note: Sample size was 228. B – regression coefficient, aOR – adjusted odds ratio, CI – 95% confidence interval for the odds ratio.