

Research Article

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The Effects of Abuse History and Age on the Interrelationship between Perceived Stress and Premenstrual Symptom Reports

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Abstract

Abuse remains a pervasive issue for women throughout their lifespan, with far-reaching consequences on a woman's physical and mental health. Previous studies have suggested that among other health issues, women who have been abused have higher reports of perceived stress (STRESS) and more severe premenstrual symptomatology. The current study assessed the effects of abuse history and age of abuse on the relationship between STRESS and Premenstrual Symptom Reports (PMSR) in women between 18 – 25 years. On the Abuse Questionnaire, participants indicated whether abuse events occurred as a child (< 14 years of age) or an adult (> 14 years). Both PMSR and STRESS were greater in women with an abuse history. Moreover, the age of abuse significantly predicted both STRESS and PMSR over and above abuse history in general. To further probe these findings, interaction analyses were performed. Results revealed a significant interaction between abuse age and STRESS on PMSR, indicating more severe symptomatology with increased stress among women who were abused as children. These findings assert the relationship between abuse and detrimental physical health outcomes, while specifically highlighting that abuse age affects the relationship between STRESS and PMSR in women.

Keywords: Sexual abuse; Physical abuse; Stress; Premenstrual symptomatology; Age; Abuse history

Introduction

According to a national survey, a large percentage of women will endure sexual and/or physical abuse during their lifetime (United States Department of Health and Human Services, 2011) [1]. Additionally, it is estimated that in the year 2012 there were 346,830 cases of sexual assault and rape within the United States (U.S. Department of Justice, 2013) [2]. These incidences are not limited to a single age group, but rather remain a pervasive threat for women across the lifespan. The number of women who experience these unfortunate events indicates that the experience is widespread, and the effects of abuse are far-reaching and severe. Physical and sexual abuse have been observed to cause serious physical health problems [3,4] and mental health disturbances [5,6]. Furthermore, women who have been abused have higher reports of perceived stress (STRESS) and more severe premenstrual symptomatology [7,8]. As evidenced by these studies, abuse affects and debilitates women on both a physical and mental level. Moreover, compared to women without a history of abuse, abused women have an increased likelihood of engaging in risky sexual behaviors and substance abuse, indicating that abuse can also affect a woman's life on multiple levels and in various contexts [9,10]. These findings have encouraged researchers to consider sexual and physical abuse as pervasive women's health concerns and as priorities for future studies. This is particularly significant when considering that components of abuse history such as the age of the victim at the time of abuse still need further investigation to determine long-term health consequences. Previous studies notwithstanding, there remains a dearth of literature critically examining abuse history, and specifically the age of the woman at the time of the abuse event as they relate to a woman's level of STRESS and severity of premenstrual symptoms.

Abuse history and the physical and mental health outcomes

Physical and sexual abuse have received more research consideration due to studies suggesting that abuse history is largely correlated with reports of physical health problems in abuse victims. In a landmark study on negative health outcomes of childhood trauma by Felitti titled 'The Adverse Childhood Experiences (ACE) Study,' which included 17,337 members of the Kaiser Health Plan in San Diego, CA,

researchers assessed eight ACEs including abuse (physical, emotional and sexual), neglect and exposure to other traumatic stressors, and found that almost two-thirds of participants in the study reported at least one ACE, and more than one of five participants had three or more ACEs. Researchers from this study found that as the number of ACEs increased, the risk for health problems such as Chronic Obstructive Pulmonary Disease (COPD), Ischemic Heart Disease (IHD), Liver Disease, and health-related negative quality of life also increased. Additionally, studies have indicated that individuals with childhood abuse histories are more likely to suffer from physical health problems such as back pain, fatigue and headaches [4]. Specifically, individuals with an ACE score between 1 and 5 have a twofold likelihood of developing frequent headaches, and the number of ACEs reported showed a graded relationship to frequency of headaches in both men and women, indicating that as negative childhood experiences accumulate, so do the physical health consequences [11]. Furthermore, sexual abuse has also been hypothesized to increase likelihood of adult mental illness, as well as a predictor for chronic pain conditions [12,13]. It was investigated that physical health outcomes and specific sexual abuse correlates in their study involving women with abuse histories, and researchers found that rape was predictive of the presence and frequency of fibromyalgia pain symptoms in women with an abuse history [14]. Given these findings, we now understand that abuse history is highly predictive of future physical pain experiences ranging from miscellaneous pain such as frequent headaches and chest pain, to chronic and severe pain conditions such as COPD, IHD and

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Received July 23, 2014; Accepted August 23, 2014; Published August 29, 2014

Citation: Reaves DL, Maddox A, Ballard S, Lustyk KB (2014) The Effects of Abuse History and Age on the Interrelationship between Perceived Stress and Premenstrual Symptom Reports. J Women's Health Care 3: 190. doi:10.4172/2167-0420.1000190

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fibromyalgia later into adulthood [15,16]. Researchers Hart-Johnson and Green [17] furthered this understanding by postulating that the long-term health consequences to individuals who experienced abuse in childhood versus adulthood could be potentially due to the influence of developmental stage on behavioral responses to traumatic events, which highlights the potential importance of age of abuse in victims.

In addition to physical health outcomes, research has gathered that age and occurrence of sexual and physical abuse can also be predictive of negative mental health outcomes in women victims. Previous research has indicated that a history of sexual and/or physical abuse can be highly predictive of future psychological and mood disturbance disorders such as depression and anxiety [4,11,18]. These outcomes were not limited to cognitive disturbances, however. Rodgers et al. [10] found that, compared to non-abused women, those with a history of childhood abuse were more likely to engage in risky sexual behaviors as an adult such as having unprotected sex, and were also more likely to have problems with substance abuse. Given these findings, we now understand that physical and sexual abuse have negative consequences that affect both the physical and emotional well-being of the victim. More specifically, Lustyk et al. [8] found that history of abuse was correlated to self-reports of greater psychological stress and more severe premenstrual symptomatology in women between the ages of 18 and 25. Given the implications of Hart-Johnson and Green's theory that developmental stage at the time of abuse is key to behavioral responses to trauma, researchers from the current study sought to investigate whether history of abuse and victim age at onset of abuse could also affect the perception of psychological stress and severity of premenstrual symptoms (2012).

Abuse, stress, and premenstrual symptoms: interrelationships

It is currently estimated that up to ten percent of U.S. women experience premenstrual symptoms severe enough to interfere with their daily lives [19]. Research surrounding PMS is necessary given the large percentage of women affected by symptoms, and their potential for long-term duration over the lifespan [20]. Furthermore, Paddison et al. [21] conducted interviews on women seeking treatment for PMS, and found that of the 173 women interviewed, nearly 40% reported a history of sexual abuse. The relationship between abuse history and physical ailments such as chronic pain, fibromyalgia, headaches, and miscellaneous pain has been well established through previous research studies [2,22]. However, while past research has found support for the correlation between abuse and physical pain, the role of abuse in physical and mental health presents a further research opportunity. Thus, there remains a dearth of literature that critically examines abuse type and the role of abuse history as it relates to physical pain experiences such as premenstrual symptomatology severity.

The experience of stress and stress-related illness has also been linked in the literature to reports of premenstrual symptom severity. Strine et al. [23] found that in their survey of women affected by PMS, respondents who reported menstrual problems were also more likely to report suffering from anxiety, nervousness, and restlessness than women who did not report menstrual problems. Lustyk et al. [8] explored the interrelationship between the psychological and physical effects of abuse on premenstrual symptomatology reports (PMSR) in a sample of women college students ($n = 91$) and found significant positive relationships between abuse history, STRESS, and PMSR. This furthers the understanding that abuse has an effect on both stress and premenstrual symptoms. Additionally, researchers sought to determine whether stress served as a mediator in the relationship between abuse and PMSR and found that women who perceived more life stress also

reported higher scores on the PMSR. It is important to understand the positive interrelationship between abuse history, STRESS, and PMSR that has been identified in these recent research investigations. However, the significance of age at the time of being abused has not yet been investigated in the interrelationship between stress and PMSR. In the research findings previously discussed, Hart-Johnson & Green postulated that developmental stage at the time of abuse onset could be a significant component to understanding behavioral responses to trauma [17]. Therefore, the purpose of the present study was to assess whether age at the time of abuse affects the relationship between STRESS, and PMSR.

Materials and Methods

Participants

A convenience sample of 94 women undergraduate students was surveyed from introductory psychology courses at a small Pacific Northwest university. Of the 94 participants that completed the study, 3 participants provided incomplete data and were therefore not included in the study. Participants were primarily between the ages of 18 and 25 (99%) and White (96%).

Measures

Demographic questionnaire: Participants provided general demographic information, including age and ethnicity. Information about sexual orientation or social class was not collected.

Sexual and physical abuse: The Self-Report Screening Questionnaire of Sexual and Physical Abuse History [24] was used to determine if a participant had a history of abuse. This questionnaire contains ten items. Six items refer to instances of sexual abuse, either threatened or experienced (i.e., "Has anyone ever threatened to have sex with you when you did not want to?"). Such items were answered with either yes or no. The remaining four items refer to instances of physical abuse, either threatened or experienced (i.e., having been "hit, kicked, or beaten"). Participants were asked to answer these items with the frequency of occurrence. The scale was as follows: 0 = "Never," 1 = "Seldom," 2 = "Occasionally" and 3 = "Often." For every instance of abuse, either sexual or physical, participants noted whether that abuse took place in childhood (prior to the age of 14), adulthood (14 years and older), or in both phases of life.

The scores from this questionnaire provide several totals. First, this measure produces an overall total of abuse events, which can be sexual, physical, or both. Second, this questionnaire provides a total for experiences of threatened abuse, which can be sexual, physical, or both. Third, we can determine the age at which the abusive events took place, which could have occurred either in childhood or adulthood. Leserman et al. [22] administered this questionnaire to a sample of 139 women in a gastroenterology clinic and reported sufficient reliability and validity. The researchers established a test-retest reliability of 81% for the sexual abuse items and 77% for the physical abuse items with a two-month period between tests. Additionally, the researchers performed in-person interviews and determined a criterion validity of 81% for the sexual abuse items and 70% for the physical abuse items.

Perceived stress: Cohen et al. [25] developed the Perceived Stress Scale - STRESS (1983). This self-assessment contains ten items which ask participants to rate how often they have experienced thoughts and feelings indicative of stress over the course of the last month as well as the degree of stress associated with these experiences. In particular, this scale seeks to determine how much control participants experience over recent life events and whether these events are considered overwhelming

	Abused as a Child (n = 40)		Abused as an Adult (n = 51)		p
	M	SD	M	SD	
PMSR score	28.60	9.67	24.52	8.48	0.04
Stress score	23.10	3.09	21.47	3.44	0.02

Note: SPAF: Shortened Premenstrual Assessment Form

Table 1: Reported Differences in Perceived Stress (STRESS score) and SPAF Summary Score (PMSR score) by Age of Abuse.

Variable	STRESS			PMSR		
	β	R ²	R ² Δ	β	R ²	R ² Δ
Abuse History	0.25*			0.16		
Model 1		0.06*			0.03	
Abuse History	0.13			0.08		
Abuse Age	0.34**			0.24*		
Model 2		0.16**			0.08*	
			0.10**			0.05*

Note: Hierarchical regression models showing the effects of abuse history and age of abuse on reported stress (STRESS) and premenstrual symptom severity (PMSR).

* p < .05 ** p < .01

Table 2: Predicting Stress and Premenstrual Symptom Severity (N=91).

and unpredictable. Participants were presented with such questions as “In the last month, how often have you found that you could not cope with all the things that you had to do?” Participants then responded from a five-point Likert scale ranging from 0 = “Never” to 4 = “Very Often.” Four items on the STRESS need to be reverse scored and once that is done, the values are added to find an overall score between 0 and 40. Higher scores are characteristic of greater stress.

Cohen et al. [26] administered this scale to a sample of 2,387 U.S. participants (1988). From this sample, the researchers reported the normative score for women ages 18-29 years as being 14.2 ± 6.2. Cohen et al. [26] also administered the STRESS to two samples of college students and a smoking-cessation program sample and found that the STRESS had acceptable internal consistencies with coefficient alphas of 0.84, 0.85, and 0.85, respectively (1983). Furthermore, Cohen et al. [26] found a test-retest correlation coefficient of 0.85 in the first college student sample with a two-day period between testing.

Shortened premenstrual assessment form: The Shortened Premenstrual Assessment Form (PMSR) was created from the 95-item Premenstrual Assessment Form [27,28]. The PMSR contains ten items designed to detect the presence of symptoms related to the premenstrual phase of the menstrual cycle as well as any variation in the intensity of those symptoms. Participants responded from a six-point Likert scale ranging from 1 = “not present at all or no change from the usual level” to 6 = “extreme change from the usual level, perhaps noticeable even to casual acquaintances.” Scores were summed for an overall score (10-60) as well as three separate subscale scores: affect (4-24), pain (3-18), and water retention (3-18). The PMSR has been found to have a test-retest correlation range from .6 to .7 and an internal consistency with a coefficient alpha of 0.95.

Procedure

Undergraduate women completed the survey in exchange for extra credit. In order to avoid coercion, multiple alternative extra credit opportunities were given. Anonymity was maintained by placing the survey packets near the door to the classroom where participants could pick up the packets at their leisure. A consent form was included on

the packet explaining that by completing the packet, the participant was consenting to allow their data to be included in the study.

Each packet contained instructions to return the finished packet to a sealed slotted box in the classroom by the date listed on the envelope. Participants were given one school week (i.e. five days) to complete the packet, after which research assistants collected the completed packets from the classroom box. Each packet included one document for the participant to keep which thanked the participant for her time in finishing the survey and provided the contact information of the researchers so that she could contact them at a later date if debriefing information or the final results of the study were desired. 94 women chose to participate in this study. Of the 94 women that chose to participate, three women did not complete the entire packet, thus leaving a sample of 91 women.

Results

All statistical analyses were performed using Windows-based program SPSS. To assess differences in STRESS and PMSR between those with an abuse history and those with no history of abuse, the Mann-Whitney U test was used. As reported in Table 1, significant group differences were observed with more STRESS and PMSR reported among those abused.

To determine if abuse age predicted STRESS and PMSR over and above abuse history in general, hierarchical regression was performed using history of abuse as the predictor in the first model with age of abuse added as a predictor in the second model. As reported in Table 2, results revealed that age of abuse significantly predicted both dependent variables (i.e., STRESS and PMSR) over and above abuse history in general. An additional 10% of the variance in STRESS was accounted for by adding abuse age to the model while only 6% was accounted for by abuse history alone. However, the only predictive model that was significant for PMSR was the one including abuse age. Still, only an additional 5% of the variance in PMSR was accounted for by adding abuse age to the model.

To assess whether abuse age and STRESS interacted to affect PMSR, multiple regressions with interaction probing were performed in accordance with the method of [29]. The model with the interaction was statistically significant, $R^2 = .70$, $F(3, 37) = 26.99$, $p < .001$, accounting for an additional 4% of the variance above the model without the interaction, $R^2 = .66$, $F(2, 37) = 34.58$, $p < .001$. The cross-product beta was also significant indicating that the slopes for the levels of the moderator (i.e., age of abuse) differ significantly (cross-product $\beta = .72$; $t(37) = 2.15$, $p = .04$). To further probe this affect, simple slopes analyses were performed by treating the two levels of the dichotomous moderator (i.e., abused as a child vs abused as an adult) as variables and including these variables in separate regression models with the interaction term.

As can be seen in Figure 1, results revealed that women who were abused as an adult differ only slightly in PMSR with increasing stress levels; a finding that is statistically non-significant ($\beta = -.21$, $p = ns$). However, being abused as a child significantly augmented the relationship between STRESS and PMSR ($\beta = .59$, $p < .001$). In other words, women abused as a child reported more severe premenstrual symptoms when stress was also high.

Discussion

The present study aimed to examine the effects of abuse history and age of abuse on the relationship between STRESS and PMSR in women. Descriptive data revealed that 42% of women surveyed had

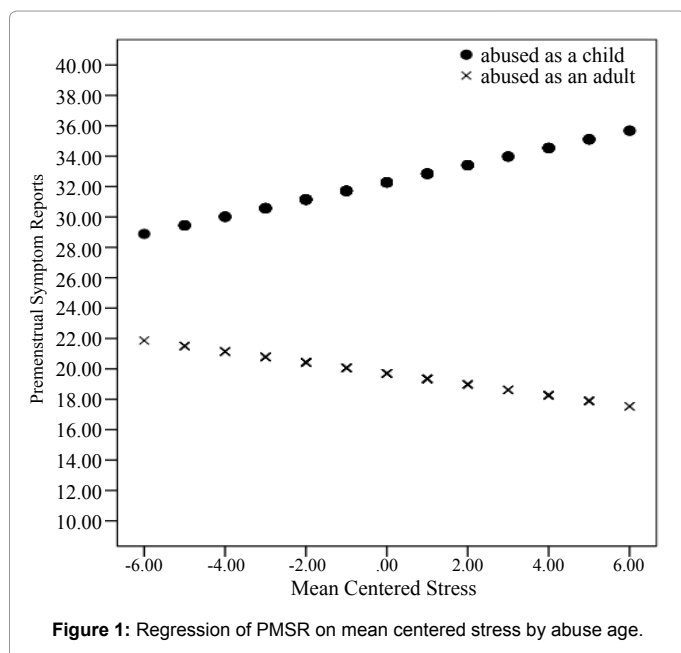


Figure 1: Regression of PMSR on mean centered stress by abuse age.

experienced abuse in some form in her lifetime, including women who had experienced it as a child (43.9% of participants who reported being abused) and woman who had experienced it as an adult (56.6%). The initial findings were that both PMSR and STRESS were greater in women with an abuse history, however, results also indicated that age of abuse significantly predicted both STRESS and PMSR over and above abuse history in general. The interaction analyses further indicated that a significant interaction was found between age of abuse and STRESS on PMSR, indicating more severe symptomatology with increased stress among women who were abused as children. These findings assert the relationship between abuse and negative physical health outcomes, and also specifically highlight that age of abuse affects the relationship between STRESS and PMSR in women.

Previous research has demonstrated that STRESS mediates the relationship between Abuse and PMSR [7]. However, findings from the current study indicate that this relationship is only significant if the abuse occurred as a child (prior to the age of 14). Moreover, as observed in Figure 1, PMSR approaches clinical levels among those abused as a child, even when only experiencing average levels of STRESS. It is also significant that above-average STRESS levels among those abused as a child correspond with increasingly clinical levels of PMSR, indicating that there is a relationship between the two variables, to where women who were abused as children may experience clinical levels of PMSR if their STRESS levels rise above average during their lifetime. This is consistent with the literature surrounding ACEs such as childhood abuse, in that the negative health consequences can have a graded relationship where each additional ACE is associated with an increased prevalence of detrimental health outcomes [2,10]. Overall, the findings from the current study reveal that abuse history is linked to PMSR, but that interaction is significant only if that abuse occurred at the age of 14 or younger. This also demonstrates a need for early interventions if a girl has been victimized by sexual or physical abuse, such as counseling that addresses the traumatic event and re-establishes a positive relationship with the body. Ideally, these interventions would occur before her period starts and PMS symptoms begin, in hopes that having mental needs addressed would decrease the severity of a chronic health issue like PMS.

Our finding that 42% of the college women that were surveyed had an abuse history either in childhood or later suggests that abuse is very pervasive. The United States Department of Health and Human Services estimates that 20% of adult women have experienced childhood sexual or physical abuse [1]. Since our population included experiences of sexual or physical abuse as a child, adult, or both, the percentage is understandably higher, but these numbers indicate that women continue to experience a high prevalence of abuse throughout their lifetimes. As illustrated by the current study's survey data, women potentially experience abuse during adulthood more frequently than childhood, and such findings reinforce the importance of further research in the area of abuse age and clinical strategies to attenuate the negative health consequences of abuse.

Furthermore, our results indicated that there was a significant interaction of age of abuse on STRESS and PMSR, which accounted for 70% of the variance in PMSR scores. These findings are in line with an extensive body of research connecting abuse with negative physical health outcomes, including chronic and severe pain conditions such as COPD, IHD, irritable bowel syndrome and fibromyalgia later into adulthood [13,30]. In addition to describing an interaction between abuse history and physical health, these findings are significant because research from the ACE study also indicates that experiences of childhood abuse can also make victims more likely to engage in health risk behaviors such as smoking, alcohol abuse and obesity [31-33]. This increased likelihood of health risk behaviors then have further resulting negative physical health consequences such as lung cancer, liver disease and heart disease [34,35]. From the results of the current study and from the literature surrounding long-term health consequences of abuse, it is possible that having a prior childhood experience of abuse, coupled with experiences of increased stress, have the potential to become a chronic health condition into adulthood.

Several limitations of the current study must be recognized when interpreting and generalizing the results. First, the sample used in the study is comprised of a largely homogenous population of young adult college women. This makes it difficult to generalize the results to older women, or women from different racial/ethnic or socioeconomic backgrounds. Additionally, the survey did not include women from clinical populations, and it is possible that the relationship between abuse age, STRESS and PMSR would be more robust in clinical samples. Furthermore, the current study used self-report measures to assess PMSR, which is a physiological condition. Future study of clinical conditions such as PMSR would benefit from assessing physiological symptoms with physiological measures. Moreover, further study of the interactions between abuse, STRESS and PMSR could include studying the effect of different types of abuse, (i.e., specifically non-sexual physical abuse or sexual abuse) on the interrelationship between STRESS and PMSR. Another interesting avenue of future study could include examining what different subscales are most influenced by early childhood abuse, whether more affective (i.e., anxiety or depression) or physical (i.e., pain, water retention) in nature.

To summarize the current study, research indicates traumatic events such as abuse can have long-term, pervasive and systemic consequences in a woman's life. The present study supports this finding by highlighting the importance of abuse age on STRESS and PMSR. Further research contributing to understanding the far-reaching difficulties associated with experiencing abuse and the resulting stress conditions as they manifest in both the mental and physical health of the victim is necessary. In particular, future studies should explore the effects of abuse history and age at the time of the abuse event on somatic symptomatology over and above PMSR.

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