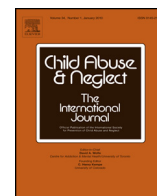




Contents lists available at ScienceDirect

Child Abuse & Neglect



PTSD and marital satisfaction in military service members: Examining the simultaneous roles of childhood sexual abuse and combat exposure

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ARTICLE INFO

Article history:

Received 10 November 2012
Received in revised form 17 May 2013
Accepted 20 May 2013
Available online 19 June 2013

Keywords:

Childhood sexual abuse
Marital satisfaction
Military veterans
Combat exposure
PTSD

ABSTRACT

Childhood sexual abuse (CSA) is relatively common and is associated with a multitude of negative outcomes in adulthood, including posttraumatic stress disorder (PTSD) and lower marital satisfaction. However, CSA has been understudied in military samples. The purpose of the present study was to examine the relative contributions of CSA and combat exposure to PTSD and marital satisfaction. Two hundred eighteen National Guard/Reserve veterans who deployed overseas between 2001 and 2008 completed self-report measures of CSA, marital satisfaction, combat exposure, and PTSD symptom severity. Data were analyzed using linear regression and path analysis to evaluate a comprehensive model including all variables. CSA accounted for unique variance in PTSD symptom severity independent of combat exposure. CSA also had a negative direct association with marital satisfaction, independent of combat exposure and PTSD symptom severity. In contrast, combat exposure had only a negative indirect association with marital satisfaction via PTSD when all variables were examined simultaneously. CSA accounted for unique variance in both PTSD symptom severity and marital satisfaction in this sample of combat veterans. Clinically, results suggest that assessment and treatment of CSA is indicated for military veterans suffering from PTSD. Further, treatment of CSA may improve marital satisfaction, which may positively affect psychological functioning in the veteran.

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Introduction

Over the past decade, more than two million military service members have deployed to combat zones in Afghanistan, Iraq, and related areas (Institute of Medicine, 2010). Over 90% of these service members report being exposed to potentially traumatic events, such as being fired upon while deployed (e.g., Hoge et al., 2004), with rates of PTSD generally estimated between 10% and 20% (e.g., Hoge et al., 2004; Milliken, Auchterlonie, & Hoge, 2007). In addition, a great deal of research over the past decade has focused on interpersonal distress in this population, with reports of increased family and marital strain related to high rates of deployment (e.g., Allen, Rhoades, Stanley, & Markman, 2011) and, particularly, to symptoms of combat-related PTSD (meta-analysis by Taft, Watkins, Stafford, Street, & Monson, 2011). To date, a significant amount of research has focused on actual combat experiences as the primary predictor of PTSD symptoms in this population, with recent research beginning to investigate other deployment-related risk factors (e.g., pre-deployment preparedness; post-deployment social support; Goldmann et al., 2012; Renshaw, 2011; Vogt & Tanner, 2007). Despite research on such military-related risk factors

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before, during, and after deployments (Goldmann et al., 2012), fewer studies have examined non-military related risk factors for PTSD severity among combat veterans. One particular risk factor for PTSD severity and poor relationship satisfaction that has only rarely been investigated in this population is the experience of childhood sexual abuse (CSA; Lapp et al., 2005).

Summarizing data across multiple epidemiological surveys in the United States, Finkelhor (2011) reports that rates of CSA in the general population range from 1.12 to 10.5 per 1,000, based on self/caretaker reports and/or agency reports. With regard to the military population, a review of the literature on trauma among female veterans revealed that between 27% and 49% report experiencing CSA (Zinzow, Grubaugh, Monnier, Suffoletta-Maierle, & Frueh, 2007). Comparatively, rates of CSA among male veterans have not been well established. In one study of 133 male veterans being treated for PTSD in a psychiatric inpatient unit of a veterans hospital, the rate of reported CSA was quite high, at 41% (Lapp et al., 2005). In another study of 64 male veterans (38 of who were being treated for PTSD on a psychiatric inpatient unit), the rate of reported CSA was 8% (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993). Notably, only individuals from the PTSD treatment group versus individuals being treated for medical problems reported a history of CSA. Thus, CSA does appear to be a relevant, albeit highly understudied, factor in military population.

Childhood abuse in general (i.e., physical, sexual, and psychological abuse, as well as neglect) has been linked with significant maladjustment and psychological difficulties later in life (e.g., Briere & Elliott, 2003; Tyler, 2002), including PTSD (Briere & Elliott, 2003; Larsen, Sandberg, Harper, & Bean, 2011; Molnar, Buka, & Kessler, 2001). Childhood abuse has also been linked to PTSD severity specifically in military veterans. An early study by Engel et al. (1993) found that childhood abuse was related to more severe PTSD, although only among female veterans. More recently, two studies have examined the moderating effect of combat exposure on the relationship between childhood abuse and PTSD symptom severity (Owens, Steger, Whitesell, & Herrera, 2009; Stein et al., 2005). In both studies, at low levels of combat exposure, a higher degree of childhood abuse was associated with increased PTSD severity. Surprisingly, at high levels of combat exposure, a higher degree of childhood abuse was associated with lower PTSD severity. One explanation offered by these researchers is that the experience of significant childhood abuse provides opportunities for individuals to develop adaptive coping skills, which may protect them when facing future traumatic events. In another set of studies, the experience of childhood abuse was shown to predict PTSD in military veterans, even when accounting for severity of combat exposure (Bremner et al., 1993; Brown, McBride, Bauer, & Williford, 2005; Van Voorhees et al., 2012). Thus, initial evidence demonstrates that childhood abuse is a relevant factor in understanding PTSD severity in military samples. However, in all of the prior studies we identified, only the broad construct of general childhood abuse was examined, with no separate examination of CSA in particular. Thus, the specific relationships among CSA, combat exposure, and PTSD symptom severity have yet to be fully evaluated empirically.

Importantly, PTSD is not the only negative outcome to arise from either CSA or military combat experiences. As noted above, another primary focus in current research on military service members is relationship distress. Results of a meta-analysis of 31 studies of the association between PTSD and intimate relationship problems, 19 of which were conducted in military samples, revealed medium-sized effects of PTSD on intimate relationship discord, physical aggression perpetration, and psychological aggression perpetration (Taft et al., 2011). Moreover, the association of symptoms of PTSD with intimate relationship problems was stronger in the 19 military samples than in the 12 civilian samples included in the meta-analysis. In a review of the literature of the psychological sequelae of combat violence, Galovski and Lyons (2004) conclude that exposure to combat increases the likelihood of developing PTSD, which in turn affects social and psychological functioning, particularly in intimate relationships within the family. This suggests that PTSD symptom severity mediates the association of combat exposure with relationship distress, which has been supported in empirical studies of veterans of the recent conflicts in Iraq and Afghanistan (e.g., Allen, Rhoades, Stanley, & Markman, 2010).

Despite the handful of studies reviewed above on history of childhood abuse in general and PTSD symptom severity in combat veterans, we were unable to identify any studies examining the effects of CSA and combat-related PTSD symptoms on marital satisfaction in combat veterans. In the general population, a history of CSA has been related to lower relationship satisfaction in adulthood (Friesen, Woodward, Horwood, & Fergusson, 2009). Similar to studies of relationship satisfaction and PTSD in military populations, some studies have found that the association of CSA with adult relationship distress is mediated by other factors, such as greater social and economic disadvantage, lower family living standards, higher rates of parental adjustment problems, more frequent parent changes (Friesen et al., 2009), partner aggression, and partner sexual risk behavior (Testa, VanZile-Tamsen, & Livingston, 2005). However, we identified no studies that examined PTSD symptom severity as a potential mediator of the link between history of CSA and relationship distress in adults. Moreover, we identified no study of CSA, combat experiences, PTSD symptom severity, and relationship distress in combat veterans.

Our goal in the current study was to address these gaps in the literature. First, we aimed to examine the relative contributions of CSA and combat exposure to PTSD symptom severity in National Guard/Reserve combat veterans and to extend prior research that has found that childhood abuse in general adds to the prediction of PTSD symptom severity in this population. Second, we aimed to examine the relative contributions of all three of these variables to relationship distress in combat veterans. Our hypotheses were: (1) CSA would be associated with unique variance in PTSD symptom severity independent of combat exposure, and (2) CSA and combat exposure would be indirectly (via PTSD symptom severity) associated with lower marital satisfaction. We hypothesized that CSA and combat exposure would not be directly associated with marital satisfaction while controlling for the effects of PTSD.

Methods

Participants

Participants included 218 (98% male) members of the National Guard or Reserves who had been deployed to Iraq (65%), Afghanistan (20%), other Middle East locations (8%), or other locations outside the Middle East (8%) during the period from 2001 to 2008. Veterans in this study were affiliated with the Army (80%) and the Air Force (20%). The sample was 91% White, with 7% of the sample identifying themselves as ethnically Hispanic. All participants in this study were married.

Procedures

Participants for the study were recruited in the context of eight voluntary workshops focused on marital relationships that were offered in 2007 and 2008 to all Utah National Guard/Reserve service members and their spouses/partners after deployments. Participants provided written informed consent, after which they completed study questionnaires on their own time during the weekend workshop or afterward. Questionnaires took 60–90 min to complete, and participants received \$10 compensation. All procedures were approved by the University of Utah Institutional Review Board and the Utah NG Judge Advocate General.

A total of approximately 490 service members attended the workshops, and 270 elected to participate, for an overall participation rate of 55%. Forty-six of these participants did not report a deployment during the OEF/OIF era, and were thus excluded from analyses. Of the remaining 224 participants, all but 6 were married. Given the focus on marital satisfaction as an outcome, these participants were dropped from analyses, resulting in a final sample size of 218.

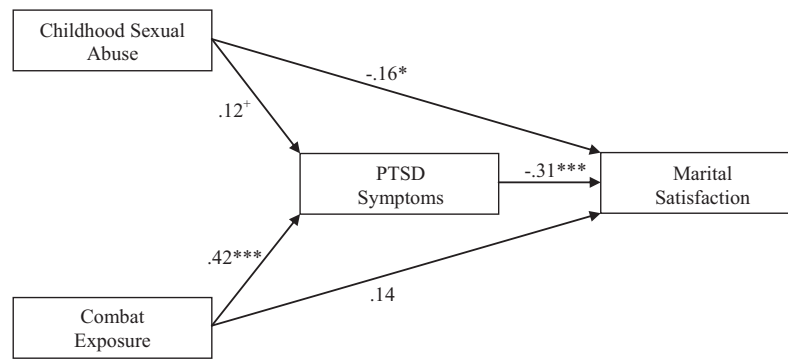
Measures

Combat exposure. Degree of combat exposure was assessed via the Combat Experiences and Aftermath of Battle subscales of the Deployment Risk and Resilience Inventory (DRRI; King, King, Vogt, Knight, & Samper, 2006). Combat Experiences assesses exposure to typical combat activities (e.g., receiving incoming fire), and Aftermath of Battle assesses exposure to typical battlefield experiences that follow combat (e.g., seeing dead bodies). The original versions of these DRRI subscales consisted of dichotomous yes/no items, but based on advice from one of the authors of the DRRI (D. S. Vogt, August 10, 2007, personal communication), the response scale for both measures in this study was changed to a 5-point Likert scale assessing the frequency of each type of event. The internal consistencies of the scales were very high (Cronbach's $\alpha = .92$, $.90$, respectively). The scales are highly correlated ($r = .78$), and a variable combining both scales has strong internal consistency (Cronbach's $\alpha = .94$). Thus, the combination of the two scales was used to represent overall severity of exposure to potentially traumatic, combat-related events during deployment (see Renshaw & Campbell, 2011).

Childhood sexual abuse. History of CSA was derived from responses on the Pre-Deployment Life Events subscale of the DRRI. This 15-item scale asks participants to report whether or not they have experienced a number of different events before age 18, including “unwanted sexual activity as a result of force, threat of harm, or manipulation.” For those who respond Yes to this question, a follow-up question asks respondents whether this occurred during childhood or adulthood (they can select both). Responses of Yes to the initial question with an indication that the incident(s) occurred during childhood were used to code presence of CSA.

PTSD symptom severity. Severity of PTSD symptoms was assessed using the PTSD Checklist (PCL; Weathers et al., 1993). The PCL is a self-report scale that has one item assessing each symptom of PTSD as specified by the Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition (APA, 1994). Each item is answered on a scale from 1 (*not at all*) to 5 (*extremely*), for total scores ranging from 17 to 105. The authors suggested that a score of 50 or higher indicates likely PTSD in military populations (Weathers et al., 1993), but more recent research using receiver operating curve analyses found that scores between 30 and 34 offered the optimal balance of sensitivity and specificity for estimating diagnosis of PTSD (Bliese et al., 2008). Overall, the 17-item scale has excellent internal consistency, test-retest reliability, and convergent and discriminant validity (Pratt, Brief, & Keane, 2006). The measure also had high internal consistency in our sample (Cronbach's $\alpha = .94$).

Marital satisfaction. Marital satisfaction was assessed using the 7-item Relationship Assessment Scale (RAS; Hendrick, 1988), which contains items such as “In general, how satisfied are you with your relationship with your spouse/partner?” and “How much do you love your spouse/partner?” Each item is answered on a Likert scale from 1 to 5, and the total score is the average of the seven items, after reverse-scoring two items. Thus, higher scores represent greater satisfaction overall. The RAS has strong internal consistency, test-retest reliability, factorial validity, and convergent validity (Hendrick, Dicke, & Hendrick, 1998; Hendrick, 1988; Renshaw, McKnight, Caska, & Blais, 2011). In our sample, the internal consistency was also high (Cronbach's $\alpha = .87$). Because all participants in our sample were married, we refer to scores on this measure as reflecting marital satisfaction.



Note: + $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Fig. 1. Path analysis model and path weights. + $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Data analytic plan

Preliminary analyses were conducted to examine distributional assumptions. Initial bivariate analyses included correlations to examine associations among PTSD symptom severity, severity of combat exposure, and marital satisfaction, as well as one-way ANOVAs to examine differences in these three variables for those with and without a history of CSA.

Subsequently, to address whether a history of CSA accounted for unique variance in PTSD symptom severity independent of combat exposure, a linear regression of PTSD symptom severity onto combat exposure and presence/absence of CSA was conducted. Finally, to examine how a history of CSA, degree of combat exposure, and current PTSD symptom severity contributed to the prediction of current marital satisfaction, we conducted a path analysis with combat exposure and CSA as exogenous (predictor) variables, marital satisfaction as the endogenous (outcome) variable, and PTSD symptom severity as a mediating variable (see Fig. 1).

Results

Descriptives and bivariate associations

Means, standard deviations, and intercorrelations of combat exposure, PTSD symptoms, and marital satisfaction are shown in Table 1. All variables were normally distributed, with skewness and kurtosis values less than 1.8. As expected, PTSD symptom severity was significantly and positively correlated with severity of combat exposure and significantly and negatively associated with marital satisfaction. Combat exposure and marital satisfaction were not significantly correlated.

Of the 218 veterans included in study analyses, 15 (7%) endorsed a history of CSA. This rate is similar to past studies (e.g., Bremner et al., 1993). Results of one-way ANOVAs suggested that those reporting a history of CSA reported significantly lower marital satisfaction ($M = 3.98$, $SD = .44$) compared to those without a history of CSA ($M = 4.45$, $SD = .61$), $F(1,194) = 8.59$, $p < .01$. However, there were no significant mean differences between those with and without a history of CSA in level of combat exposure ($F[1,192] = .77$, $p = .38$) or PTSD symptom severity ($F[1,195] = 2.28$, $p = .13$).

The regression of PTSD symptom severity onto combat exposure and CSA was significant ($F[2,173] = 24.76$, $p < .001$), and both combat exposure ($\beta = .46$, $p < .001$) and CSA ($\beta = .15$, $p < .05$) were significant predictors. Thus, consistent with our hypothesis, CSA accounted for unique variance in service members' PTSD symptom severity independent of combat exposure.

The path analysis examining direct and indirect (via PTSD symptom severity) effects of both CSA and combat exposure on marital satisfaction provided excellent fit for the data ($\chi^2[1] = .82$, $p = .36$; $NFI = .99$; $CFI = 1.00$, $RMSEA = .00$). The standardized coefficients from the path analysis are shown in Fig. 1. As expected, PTSD symptom severity had a significant direct negative association with marital satisfaction. Also as expected, combat exposure demonstrated a negative indirect

Table 1

Means, standard deviations, and intercorrelations of primary measures.

	M	SD	1	2
1. PTSD-severity	30.72	12.54		
2. Combat exposure	46.84	16.63	.41***	
3. Marital satisfaction	4.40	.63	-.27***	.00

Note. $N = 218$; PTSD = posttraumatic stress disorder.

*** $p < .001$.

association ($b = -.13$) with marital satisfaction, but the direct association of combat exposure with marital satisfaction was non-significant. On the other hand, CSA exerted a minimal indirect effect ($b = -.04$) on marital satisfaction via PTSD symptom severity, but demonstrated a significant negative direct effect on marital satisfaction. These results indicate that combat exposure has only an indirect negative effect on marital satisfaction (via PTSD symptom severity), whereas CSA exerts a direct negative effect on marital satisfaction that is independent of the effects of combat exposure and PTSD symptom severity.

Discussion

To date, no study has examined how the experience of CSA is associated with both PTSD symptom severity and marital satisfaction in a sample of military combat veterans. Additionally, to our knowledge, no study has examined PTSD symptom severity as a potential mediator of the link between history of CSA and marital satisfaction in adults. The current study addressed these gaps using a sample of National Guard/Reserve soldiers who had been deployed to the Middle East at least once since the beginnings of OEF/OIF.

Consistent with hypotheses, a history of CSA explained unique variance in PTSD symptom severity, independent of combat exposure. This finding is consistent with past research that has found an association between prior trauma and likelihood of developing PTSD (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003) and, more specifically, between history of childhood abuse (broadly defined) and PTSD symptom severity independent of combat exposure (Bremner et al., 1993; Brown et al., 2005; Van Voorhees et al., 2012). However, this is the first study to examine CSA specifically in this context. These prior and current findings suggest that factors unique to CSA (and perhaps child abuse more broadly) continue to affect PTSD symptom severity even among individuals exposed to traumatic events in adulthood. One potential explanation for this finding is that CSA functions as a diathesis for the later development of PTSD, and combat exposure then serves as a stressor that exceeds a military member's ability to cope. More specifically, the diathesis of CSA may affect coping and adjustment during the transition to adolescence and eventually adulthood and active service. For example, CSA has been associated with dissociation (Chu & Dill, 1990), which is a known risk factor for the development of PTSD following a trauma (Breh & Seidler, 2007). Additionally, other childhood factors, such as degree of social support, reactions to disclosure, and timing of abuse, may affect one's processing of CSA (Ballon, Courbasson, & Smith, 2001; Bolton, Glenn, Orsillo, Roemer, & Litz, 2003), which could also be related to the extent to which military veterans experience symptoms of PTSD after combat. Thus, CSA may engender vulnerability for the development of PTSD symptoms after combat via a number of predisposing mechanisms. At the same time, some prior research has found that the severity of childhood abuse may attenuate the association between severity of combat exposure and PTSD (Owens et al., 2009; Stein et al., 2005). Although we could not evaluate such a relationship in our sample due to the limited nature of our assessment of CSA, the totality of results in this area suggests that further research of the complex associations among childhood abuse, combat exposure, and PTSD is needed in the military population.

When CSA was considered simultaneously with combat exposure and PTSD symptoms, results replicated prior findings regarding the significant negative association of PTSD symptom severity with marital satisfaction (Taft et al., 2011) and the significant negative indirect association of combat exposure with marital satisfaction via PTSD symptoms (Galovski & Lyons, 2004). Interestingly, even when accounting for both combat exposure and PTSD symptom severity, CSA maintained a significantly negative direct effect on marital satisfaction. Moreover, the indirect effect of CSA on marital satisfaction via PTSD symptoms was negligible. Thus, the association of CSA with marital satisfaction appears independent of military-related experiences (e.g., combat exposure and consequent PTSD symptoms).

This finding is noteworthy and highlights the importance of accounting for CSA in understanding military veterans' marital satisfaction. Similar to the effect of CSA on PTSD, factors associated with vulnerabilities that arose due to CSA may help explain this direct relationship. As Friesen et al. (2009) noted in their longitudinal study of CSA and intimate partner relationship outcomes, CSA was associated with factors such as self-esteem and number of sexual partners in adolescence, which may in turn affect adult marital satisfaction. Indeed, Friesen and colleagues found that many of these variables partially or fully mediated the relationship between CSA and marital satisfaction. Additionally, it is possible that CSA and combat-related PTSD symptoms may affect different elements of romantic relationships (e.g., physical vs. emotional intimacy). Finally, CSA has also been associated with high-conflict and physical violence in intimate relationships among female veterans (Campbell, Greeson, Bybee, & Raja, 2008) and community women (Kallstrom-Fuqua, Weston, & Marshall, 2004). Although the current sample was predominantly male, it is reasonable to assume that similar processes may negatively affect marital satisfaction. Taken together, it appears plausible that factors associated with the reaction to and processing of CSA among veterans are uniquely associated with marital satisfaction, independent of military-related factors.

Clinically, the results regarding CSA suggest that careful screening of CSA history is important in order to fully understand a veteran's PTSD symptom severity and marital satisfaction. Indeed, CSA might affect a veteran's response to treatment for PTSD and interventions designed to address marital satisfaction. Specific, trauma focused therapy may be indicated, not only for treating the response to combat experience, but also for adequately processing early CSA. It is possible that different forms of evidenced-based cognitive-behavioral treatments (e.g., Foa, Keane, Friedman, & Cohen, 2008; Resick, Monson, & Chard, 2008) may need to be integrated to fully treat individuals exposed to multiple forms of trauma. Also, focusing on the effects of CSA on marital satisfaction, even independent of any PTSD symptoms, may enhance couples therapy for military veterans. It is possible that assessment and treatment of CSA may improve marital satisfaction, thereby improving functioning in the military veteran (see Doss et al., 2011).

While this study is the first to simultaneously examine CSA, combat exposure, PTSD symptom severity, and marital satisfaction, a number of limitations must be acknowledged when interpreting these results. First, this sample was 98% male, thus limiting generalizability. While this is indeed a limitation, it is also noteworthy that CSA showed such significant effects even in a highly specific population (i.e., military men). Also, this sample was comprised of veterans who were married, members of the National Guard/Reserves, and predominantly White. The pattern of results from this study may not generalize to more heterogeneous samples of military veterans. Further, participants were recruited in the context of a voluntary workshop on marital relationships. It is possible that individuals attending this group may differ on the variables included in this study compared to individuals who declined participation in this workshop. Additionally, this study used a cross-sectional design with retrospective self-report instruments. Thus, causality of effects cannot be determined, and there is potential bias in participants' responses. Future research would benefit from using a prospective research design to clarify temporal relationships of risk variables and outcomes in order to determine causality. Another limitation is the relatively low number of individuals reporting CSA. Although the number of reports in this sample is consistent with past research, confidence in findings may be limited by how few male veterans reported CSA. Future research should increase efforts to assess prevalence of CSA in military veterans in order to increase awareness and knowledge in this area. Additionally, it would be interesting to study the effect of CSA in a more diverse sample, which includes female veterans. This may be a particularly important area for future research, given the recent focus on military sexual trauma (MST; Suris & Lind, 2008), which may differentially affect male and female veterans. Indeed, future research would benefit from clarifying the role of CSA and more recent MST on psychological functioning (e.g., PTSD) and marital satisfaction.

In spite of limitations, the current study represents the first study to examine the role of CSA in both PTSD symptom severity and marital satisfaction while accounting for a well-known predictor of both outcomes, combat exposure. This study provides evidence for the importance of assessing and addressing CSA among military veterans and suggests that future research on PTSD symptom severity and marital satisfaction would benefit from accounting for the effects of CSA.

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