Research Article

COMBAT-RELATED GUILT MEDIATES THE RELATIONS BETWEEN EXPOSURE TO COMBAT-RELATED ABUSIVE VIOLENCE AND PSYCHIATRIC DIAGNOSES

Brian P. Marx, Ph.D.,[1–3]* Kristen M. Foley, B.A.,[1] Brian A. Feinstein, B.S.,[1] Erika J. Wolf, Ph.D.,[1,2] Danny G. Kaloupek, Ph.D.,[1–3] and Terence M. Keane, Ph.D.[1–3]

Background: *This study examined the degree to which combat-related guilt mediated the relations between exposure to combat-related abusive violence and both Posttraumatic Stress Disorder (PTSD) and Major Depressive Disorder (MDD) in Vietnam Veterans.* **Methods:** *Secondary analyses were conducted on data collected from 1,323 male Vietnam Veterans as part of a larger, multisite study.* **Results:** *Results revealed that combat-related guilt partially mediated the association between exposure to combat-related abusive violence and PTSD, but completely mediated the association with MDD, with overall combat exposure held constant in the model. Follow-up analyses showed that, when comparing those participants who actually participated in combat-related abusive violence with those who only observed it, combat-related guilt completely mediated the association between participation in abusive violence and both PTSD and MDD. Moreover, when comparing those participants who observed combat-related abusive violence with those who had no exposure at all to it, combat-related guilt completely mediated the association between observation of combat-related abusive violence and MDD, but only partially mediated the association with PTSD.* **Conclusions:** *These findings suggest that guilt may be a mechanism through which abusive violence is related to PTSD and MDD among combat-deployed Veterans. These findings also suggest the importance of assessing abusive-violence related guilt among combat-deployed Veterans and implementing relevant interventions for such guilt whenever indicated. Depression and Anxiety 27:287–293, 2010.* © 2010 Wiley-Liss, Inc.

Key words: *abusive violence; guilt; posttraumatic stress disorder; major depressive disorder; veterans*

Combat-related abusive violence is defined as engaging in behavior or seeing others behave in a way that other people would consider excessively violent or brutal, even in wartime.[1] Earlier research has shown that, even after controlling for overall levels of combat exposure, exposure to such experiences increases the risk for development of Posttraumatic Stress Disorder (PTSD) among combat Veterans.[2–8] Furthermore, MacNair found that although PTSD symptom severity scores were generally higher for Vietnam Veterans who reported more traditional combat killing, Vietnam Veterans who acknowledged committing abusive violence reported the highest mean PTSD symptom severity score.[9]

[1]Behavioral Sciences Division of the VA National Center for PTSD, Boston, Massachusetts
[2]Psychology Service of the VA Boston Healthcare System, Boston, Massachusetts
[3]Department of Psychiatry, Boston University School of Medicine, Boston, Massachusetts

The authors report they have no financial relationships within the past 3 years to disclose.

*Correspondence to: Brian P. Marx, Psychology (116B-4), VA Boston Healthcare System, 150 S. Huntington Avenue, Boston, MA 02130. E-mail: brian.marx@va.gov

Received for publication 14 September 2009; Revised 3 December 2009; Accepted 5 December 2009

DOI 10.1002/da.20659
Published online 22 January 2010 in Wiley InterScience (www.interscience.wiley.com).

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Although the diagnosis of PTSD currently requires the experience of fear, helplessness, or horror at the time of the trauma (PTSD Criterion A2), guilt is a frequently reported peritraumatic emotion that may also be critical to the development and/or maintenance of the disorder. Commission of abusive violence is one type of wartime experience that may be particularly associated with guilt. Guilt has been documented as frequent and severe in Vietnam combat Veterans with chronic PTSD,[10–14] and there is evidence that guilt associated with wartime events is correlated with PTSD and depression symptoms.[13,15–19]

Some have earlier hypothesized that combat-related guilt may mediate the relation between participation in and/or having witnessed combat-related abusive violence and PTSD or other trauma-related psychopathology.[1,4,20] Importantly, no earlier study has directly examined the mediation hypothesis. In this study, we hypothesized that combat-related guilt would mediate the association between exposure to combat-related abusive violence and the presence of both PTSD and Major Depressive Disorder (MDD) among Vietnam Veterans. We included level of overall combat exposure in our analyses to control for the effects of this important variable on the outcomes of interest.

METHODS

PARTICIPANTS AND PROCEDURE

These data were collected as part of VA Cooperative Study 334, conducted between 1989 and 1992, which examined the utility of psychophysiological assessment for PTSD.[21] Participants were male Veterans who served in the Vietnam War between August 1964 and May 1975. They were recruited over 42 months through the Department of Veterans Affairs inpatient and outpatient services at 15 sites across the United States. Individuals were excluded if they were already participating in a VA Cooperative Study, had a precluding physical condition, such as cardiovascular disease, previous myocardial infarction, angina, uncontrolled hypertension, endocrine disorder, or seizure disorder, or were taking β blockers which would alter their psychophysiological responses. Individuals on other psychotropic and/or autonomically active medications were included if the patient and their physician agreed to discontinue use for four half lives plus 14 days before and during study participation. Individuals on all other medications were included. Of the 1,325 individuals who completed diagnostic interviewing in the original study, this study focused on the 1,323 participants who had data regarding their exposure to war-time abusive violence, overall level of combat exposure, combat-related guilt, or PTSD and MDD diagnoses.

In addition to psychophysiological challenge testing, participants were assessed using the Structured Clinical Interview for DSM-III-R, the War Stress Inventory, and the Laufer–Parsons Inventory. Additional self-report measures were administered, but are not relevant to this study (for more details, see Keane et al.[21]). Informed consent was obtained for participants after the procedures were explained.

The mean age of the sample was 43.28 ($SD = 3.77$) and the mean number of years of education (calculated by summing the number of years pre- and post-Vietnam service) was 13.88 ($SD = 2.40$). Sixty-seven percent of the sample self-identified as Caucasian, 20% as African American, 9% as Hispanic, and 4% as other. Fifty-two percent of the sample indicated that they were currently married.

MEASURES

Structured Clinical Interview for DSM-III-R.[22]. The Structured Clinical Interview for DSM-III-R (SCID) is a semi-structured diagnostic interview that was administered by doctoral-level clinicians. For this study, current (i.e., past month) SCID-derived diagnoses of PTSD and MDD were examined. All SCID interviews were audiotaped and 128 were reviewed by a study clinician at a second site. Similarly, a second clinician at the same site repeated SCID interviews on 36 participants. Taken together, the mean interrater reliability coefficients (Cohen's kappa) were .81 and .53 for current versus no current PTSD and MDD, respectively.

War Stress Inventory.[23]. The War Stress Inventory (WSI) is a self-report instrument designed to assess sociodemographics, psychological history, and mental health information after returning from war. For this study, a single item from the WSI was used to assess observing or participating in combat-related abusive violence. The item asks, "Did you ever observe others or participate yourself in things that other people would consider excessively violent or brutal, even in wartime?" Several examples of combat-related abusive violence were provided, including torturing prisoners, mutilating enemy bodies, and harming civilians. Response options included: No; Observed others; Participated oneself; or Decline to answer. Those who declined to answer were excluded from the analyses.

Combat Exposure Scale.[24]. The Combat Exposure Scale (CES) is a self-report measure comprised of seven items that produce a summed weighted score ranging from 0 to 41 or a summed raw score ranging from 0 to 26. The CES was developed to quantify the traditional combat experiences of military personnel deployed during the Vietnam War (e.g., men in one's unit killed in action, number of times surrounded by the enemy). For the path analyses, we evaluated combat exposure as a categorical variable to aid comparisons between the two predictor variables, given that the other predictor variable (exposure to abusive violence) was categorical. Those who had a raw score of zero were placed in the no combat exposure category. Based on the raw score sample mean, those with a raw score of 17 or below were placed in the low combat exposure category, and those with raw scores of 18 or above were placed in the high combat exposure category.

Laufer–Parsons Inventory.[25]. The Laufer–Parsons Inventory (LPI) is a 33-item self-report instrument used to assess combat-related guilt. Specifically, participants are asked to rate their guilt over the past 6 months in relation to their combat experiences. Questions range from assessing guilt or remorse regarding specific acts of commission during combat (e.g., "How often have you had remorse over killing a child or children in the war?"), acts of omission during combat (e.g., "How often have you gotten upset for not risking your own life to help a wounded buddy or comrade who later died?"), and general feelings of guilt (e.g., "How often have you had feelings of guilt without knowing why you feel that way?"). Responses are provided using a Likert-type scale that ranges from 1 (never) to 5 (very often). Item responses are summed to provide a total LPI scale score, with higher scores indicating greater overall combat-related guilt. Reliability analyses indicated high internal consistency among the items in the scale ($\alpha = .97$).

STATISTICAL ANALYSES

We used path analysis to examine the potential mediating role of combat-related guilt in the association between retrospective self-reports of observing or participating in combat-related abusive violence, and subsequent PTSD and MDD diagnosis. We initially combined individuals who reported observing combat-related abusive

violence with those who reported participating in it, and the combined group (hereafter referred to as individuals *exposed* to combat-related abusive violence) was compared with those who had not been exposed to it. Thus, our combat-related abusive violence variable was coded dichotomously (i.e., no exposure = 0 and exposure = 1). This approach allowed us to examine the degree to which exposure to combat-related abusive violence, regardless of passive or active role in it, is related to the other variables of interest.

Path analysis is superior to traditional mediation analysis in that it allows for the examination of direct and indirect effects in one analysis, whereas traditional mediation analysis involves three separate regression equations.[26] In addition, as path analysis allows for multiple dependent variables, the effects of combat-related abusive violence, combat exposure, and combat-related guilt on both PTSD and MDD can be modeled in one analysis. Finally, this approach is indicated in this study as it allows for the inclusion of both dimensional (e.g., scores on the LPI and CES) and categorical (e.g., presence of diagnoses, exposure to combat-related abusive violence) variables.

All analyses were carried out using the Mplus 5.1 statistical modeling software.[27] We used the variance-adjusted weighted least squares (WLSMV) estimator to account for the dichotomous nature of the dependent variables. This is a full information maximum likelihood estimator that allows for inclusion of cases with some missing data rather than eliminating cases with missing data either pairwise or listwise, an approach which is likely to lead to biased parameter estimates.[28] The maximum amount of missing data on any variable in this analysis was 28% for MDD.

In the initial path analysis, the PTSD and MDD diagnoses were simultaneously regressed on LPI total score (the mediator) and on combat-related abusive violence exposure and CES total score (the predictor variables); LPI total score was regressed on combat-related abusive violence exposure and CES total scores, allowing estimation of the strength and statistical significance of the indirect effects of combat-related abusive violence and traditional combat exposure on PTSD and MDD via LPI total score. This approach of including both combat-related abusive violence and combat exposure in the same model allows for examination of the effects of each predictor variable in the prediction of PTSD and MDD while controlling for the effect of the other predictor variable. PTSD and MDD were allowed to correlate in the model, as the two variables were expected to relate to one another, even after accounting for the shared effects of combat-related abusive violence exposure, combat exposure, and LPI total scores on the two disorders. As is standard in multiple regression-based analyses, the two predictor variables were allowed to intercorrelate.

Two additional path analyses were conducted to examine the differential effects of observing versus participating in combat-related abusive violence. In these follow-up analyses, we examined the relative effects of participating versus observing combat-related abusive violence (in the first path model) and of observing versus no exposure to combat-related abusive violence (in the second path model) on combat-related guilt, and PTSD and MDD diagnostic status. Consistent with our main analysis, we regressed current PTSD and MDD diagnoses on LPI total score (the mediator) and combat-related abusive violence (the predictor); LPI total score was regressed on combat-related abusive violence. For all models, completely standardized path estimates are reported; these are akin to standardized beta parameter estimates in traditional regression analysis.

RESULTS

PRELIMINARY ANALYSES

Preliminary analyses indicated that 775 participants (59%) were diagnosed with current military-related PTSD and 323 participants (24%) were diagnosed with current MDD (Table 1). Additionally, 490 participants (37%) reported that they did not observe or participate in any abusive violence, 382 (29%) reported that they observed others commit abusive acts, and 376 (28%) reported that they committed abusive violence. Of the 75 individuals who did not have data regarding exposure to abusive violence, 12 chose the "decline to answer the question" response option and 63 left the item blank.

Combat exposure severity, based on the raw total score totals, differed among the groups, $F(2, 1{,}214) = 181.55$, $P<.001$. Specifically, those who reported participating in abusive violence reported significantly more combat exposure ($M = 20.07$, $SD = 4.33$; $M = 31.46$, $SD = 6.94$; raw score and weighted score, respectively) than both those who only observed abusive violence ($M = 17.59$, $SD = 5.30$; $M = 27.55$, $SD = 8.50$; raw score and weighted score, respectively, $P<.001$) and those with no exposure to abusive violence ($M = 12.73$, $SD = 6.88$; $M = 19.93$, $SD = 10.82$; raw score and weighted score, respectively, $P<.001$). Furthermore, those who reported observing abusive violence had significantly more combat exposure than those who had no exposure to abusive violence ($P<.001$). The association between exposure to abusive violence and exposure to traditional combat was $r = .47$, $P<.001$.

MEDIATION ANALYSES

Intercorrelations among the variables included in the first path model are provided in Table 2. The results of the first path analysis are presented in Figure 1. As shown in Figure 1, exposure to combat-related abusive violence and traditional combat exerted direct effects on PTSD as well as indirect (e.g., mediated) effects on PTSD via combat-related guilt (indirect path for combat-related abusive violence = .25, $P<.001$ and for traditional combat = .17, $P<.001$). This reflects partial mediation, wherein the effect of exposure to combat-related abusive violence and traditional combat exposure on PTSD is partially explained by combat-related guilt, but immediate, direct effects of each predictor on the diagnosis also exist. In contrast, there were no direct effects of exposure to combat-related abusive violence or traditional combat on MDD; instead, these variables exerted only indirect effects on MDD through combat-related guilt (indirect path

TABLE 1. Combat-related guilt and psychiatric diagnoses as a function of exposure to abusive violence

Variable	Exposed to abusive violence ($n = 758$)	Not exposed to abusive violence ($n = 490$)
Combat-related guilt, mean (*SD*)	87.70 (32.15)	58.80 (25.28)
PTSD diagnosis, No. (%)	547 (72.2)	177 (36.1)
MDD diagnosis, No. (%)	224 (29.6)	75 (15.3)

for combat-related abusive violence = .16, $P<.001$ and for traditional combat = .11, $P<.001$). In total, 73% of the variance in PTSD and 25% of the variance in MDD was explained by the model.

Results of the first follow-up path model are presented in Figure 2. Relative to observing combat-related abusive violence, participating in such violence exerted an indirect effect on both PTSD (indirect effect = .20, $P<.001$) and MDD (indirect effect = .12, $P<.001$) via combat-related guilt while no direct effects of these predictor variables on either diagnosis were observed. The magnitude of the indirect effect for PTSD was nearly twice that of the indirect effect for MDD, with the 95% confidence intervals for the two indirect effects revealing minimal overlap (i.e., .31–.52 for PTSD and .16–.32 for MDD). Similarly, the total variance explained in PTSD (52%) by the model was greater than that for MDD (17%).

Finally, the results of the model comparing the effects of observing combat-related abusive violence relative to no such exposure on PTSD and MDD are shown in Figure 3. In this model, observing combat-related abusive violence exerted a direct effect on the development of PTSD, but not on MDD; it also exerted indirect effects on both PTSD (indirect path = .26; $P<.001$) and MDD (indirect path = .18, $P<.001$). As with the earlier two models, this model explained a greater proportion of variance in PTSD (69%) relative to MDD (30%), suggesting the greater relevance of the combat-related violence and combat-related guilt variables to this diagnosis.

TABLE 2. Bivariate correlations among predictor, mediator, and dependent variables

	1	2	3	4	5
AV	1.0				
CES	.56	1.0			
LPI	.55	.45	1.0		
PTSD	.64	.54	.73	1.0	
MDD	.33	.28	.50	.70	1.0

Note. AV, abusive violence; CES, Combat Exposure Scale; LPI, Laufer–Parsons Inventory; PTSD, Posttrumatic Stress Disorder; MDD, Major Depressive Disorder. Abusive violence was coded dichotomously (0 = no such exposure, 1 = observe or participate in combat-related abusive violence). Correlations among dimensional variables are Pearson correlations; correlations among categorical variables are tetrachoric and polychoric correlations. All correlations are statistically significant at the $P<.001$ level.

DISCUSSION

Combat-related guilt partially mediated the association between exposure to abusive violence during combat and PTSD, and completely mediated the association between exposure to abusive violence during combat and MDD. Follow-up analyses showed that, when contrasting participating in with observing abusive violence, combat-related guilt completely mediated the association between participation in abusive violence and both PTSD and MDD. Importantly, the strength of the indirect effect of participating in combat-related abusive violence on PTSD via combat-related guilt was nearly twice the strength of the indirect effect of participating in combat-related abusive violence on MDD. Furthermore, follow-up analyses indicated that, when contrasting observing abusive violence with no reported exposure, combat-related guilt completely mediated the association

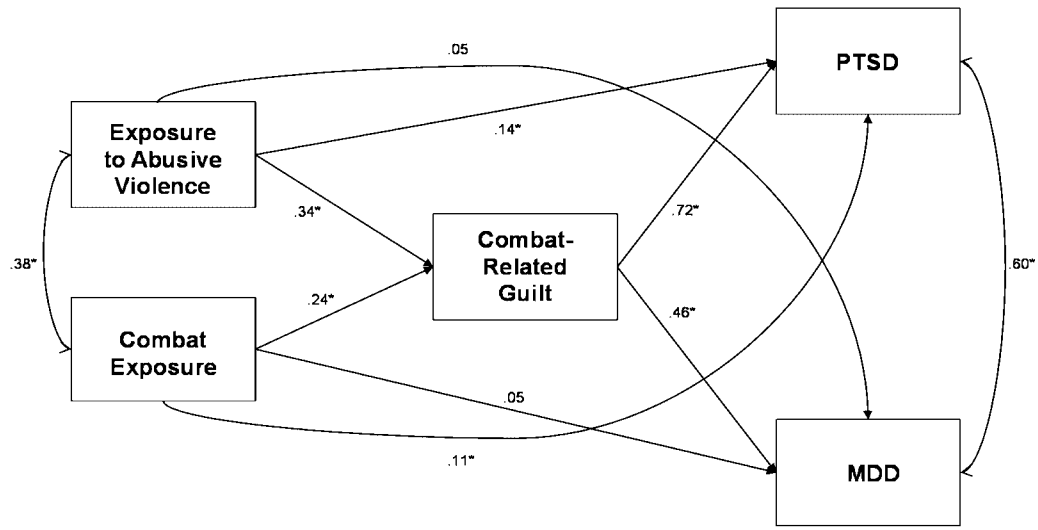

Figure 1. The direct effects among exposure to combat-related abusive violence and combat exposure relative to no exposure to combat-related abusive violence, combat-related guilt, PTSD, and MDD. PTSD, Posttraumatic Stress Disorder; MDD, Major Depressive Disorder; All numerical values represent completely standardized coefficients, *($P<.001$). Sample size for Model 1 was 1,323.

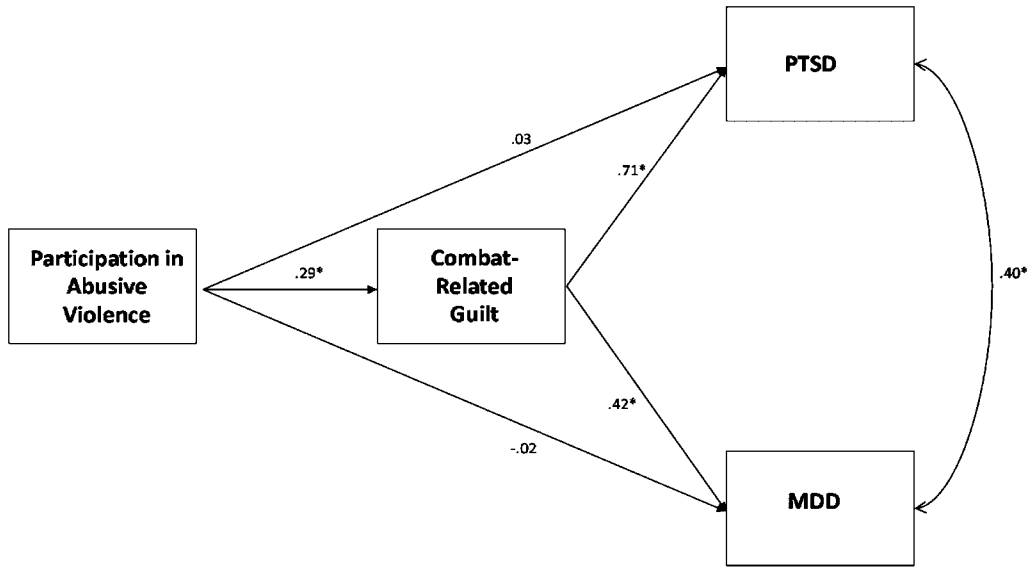

Figure 2. The direct effects among participation relative to observation of combat-related abusive violence, combat-related guilt, PTSD, and MDD. PTSD, Posttraumatic Stress Disorder; MDD, Major Depressive Disorder; All numerical values represent completely standardized coefficients, *(P<.001). Sample size for Model 2 was 757.

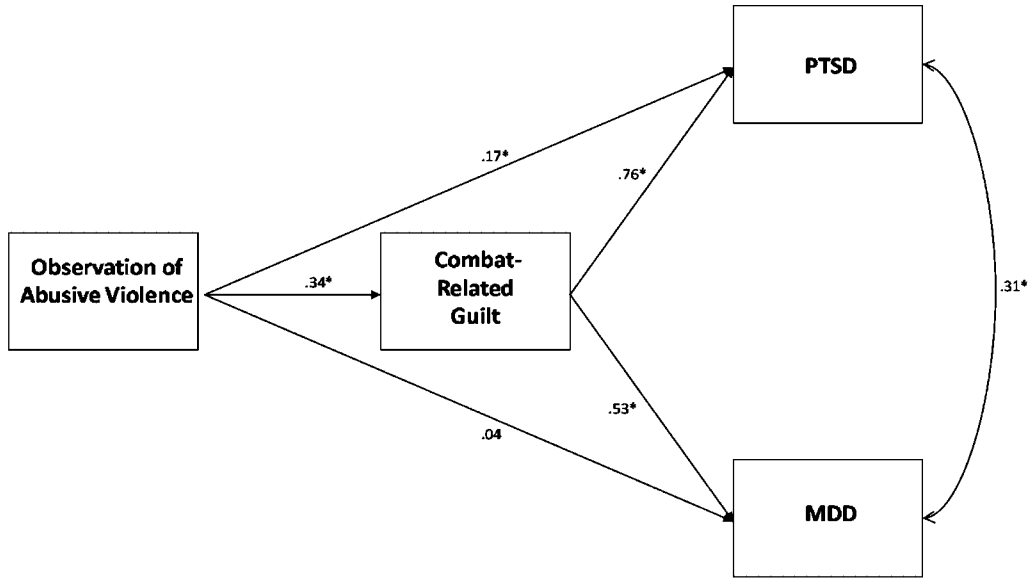

Figure 3. The direct effects among observation relative to no exposure of combat-related abusive violence, combat-related guilt, PTSD, and MDD. PTSD, Posttraumatic Stress Disorder; MDD, Major Depressive Disorder; All numerical values represent completely standardized coefficients, *(P<.001). Sample size for Model 3 was 871.

between observation of combat-related abusive violence and MDD and partially mediated the association with PTSD.

These findings suggest that guilt associated with particular actions or inactions is a possible explanatory mechanism for understanding the association between participation in or observation of combat-related abusive violence and both PTSD and MDD. Guilt has been construed as recognition of personal wrongdoing[17,29] and subsequent self-condemnation for such wrongdoings.[30] PTSD-related guilt has been more specifically conceptualized as the recognition of wrongdoing and subsequent self-condemnation related to actions or inactions that either threatened an individual's own survival or protected the individual's own life while exposing others to danger. In the context of exposure to combat-related abusive violence, either as an active participant or more passive observer, one's feelings of wrongdoing and self-denigration are hypothesized to lead to symptoms of PTSD and MDD.

The partial mediation observed for the association between exposure to combat-related abusive violence and PTSD may be the result of increased representation produced by combining participation in and observation of combat-related abusive violence groups under one variable. When these behaviors were separated and compared with each other and a no exposure group, the effects for combat-related guilt largely changed from partial to complete mediation, indicating that guilt completely accounted for the association between exposure to abusive violence and PTSD.

Our findings that combat-related guilt either completely or partially mediated all associations between combat-related abusive violence and PTSD and MDD diagnoses are consistent with the cognitive model of PTSD that emphasizes the role of individuals' appraisals or interpretations of their traumatic experiences. This theory assumes that negative appraisals and interpretations about the trauma and one's responses to it evoke prolonged and intense emotional reactions that then interfere with daily functioning.[31] The cognitive model of PTSD assumes that the exaggerated emotional responses are caused by distorted or dysfunctional interpretations of the traumatic event or one's responses to it. These results are also consistent with cognitive models of depression,[32] which assert that depression is caused by cognitive factors (e.g., negative and self-devaluative thoughts,[32] rumination[33]) and stressors.

Breslau and Davis[2] earlier found that participation in combat-related abusive violence was related to the development of PTSD, but not MDD. Importantly, Breslau and Davis obtained their results using a substantially smaller sample ($n = 69$) than ours. It was earlier suggested that the presence of guilt may differentiate individuals with co-occurring PTSD and MDD from those with only MDD.[34] However, this study's results indicate that both exposure to combat-related abusive violence and combat-related guilt may be related to MDD as well as PTSD, even after accounting for the shared variance between the disorders.

Current findings may be understood in learning theory terms outlined by the serial conditioning model of psychopathology.[35] The key assumption is that guilt-related cuing occurs before the fear-related cuing that is commonly associated with PTSD. Thus, reminders about military experience elicit guilt reactions that are reduced by disengagement from the memories. This preemptive escape maintains the guilt reaction and prevents exposure to the fear-related cues. Such exposure is thought to be important for unassisted posttraumatic recovery and is fundamental to extinction-based therapy techniques.[36] Exposure-based treatments may need to be modified to address the implications of such serial cuing of affect and avoidance. Cognitive-behavioral trauma-focused therapies that emphasize cognitive restructuring or resolution of cognitive "stuck points," as well as extinction of trauma-related affective responses,[37,38] may be particularly well-suited to trauma survivors for whom guilt regarding acts of omission or commission is a prominent feature.

The findings of this investigation are consistent with a growing body of research demonstrating that individuals who suffer psychological pain and turmoil as a consequence of their actions toward others may also be at risk for PTSD or other trauma-related psychopathology.[39–42] Our findings expand upon the earlier work by suggesting a gradient for exposure to combat-related abusive violence, such that participating in these acts may be more injurious than observing others commit them.

There are several limitations to our study. The cross-sectional nature of the data prohibits us from making firm conclusions about the degree to which guilt causes PTSD or MDD in the wake of committing or witnessing combat-related abusive violence. The retrospective self-report of exposure to combat-related abusive violence in this study introduces the possibility of various types of response and memory biases. Furthermore, participants in this study experienced multiple traumatic stressors during combat deployment and we cannot discount the possibility that other military stressors may be the source of symptomatology.

The dichotomous nature of several study variables may have prevented us from observing stronger associations among study variables, as dichotomizing constructs that are dimensional in nature will attenuate the magnitude of their associations. Additionally, the LPI, our measure of guilt, has not been studied extensively. It is important to consider that guilt is a multi-faceted construct with behavioral, emotional, and cognitive components. As such, it is currently unclear which aspects of guilt are most pertinent to the development and maintenance of trauma-related psychopathology. Another potential limitation of this study is that the interrater reliability for MDD is low, which may explain why PTSD is better explained by the models than MDD.

Due to the age of the data set, the unavailability of the DSM-IV at the time, and the inclusion of Veterans who may not have experienced fear, helplessness, or horror at the time of the trauma, it is possible that these results may not fully generalize to individuals diagnosed with PTSD according to the DSM-IV. Also, because our sample was comprised of military Veterans exposed to war-zone trauma, the extent to which results will generalize to non-military trauma populations is unknown.[43]

CONCLUSIONS

Our findings suggest that guilt may be a mechanism through which abusive violence is related to PTSD and MDD among combat-deployed Veterans. These findings suggest the importance of assessing abusive-violence related guilt among combat-deployed Veterans and implementing relevant interventions for such guilt whenever indicated.

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