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Emotional Suppression and Hypervigilance in Military Caregivers: Relationship to Negative and Positive Affect

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Abstract

Objective: To investigate the relationship of 2 health-related quality-of-life (QOL) item banks (Emotional Suppression and Caregiver Vigilance), developed for caregivers of service members/veterans with traumatic brain injury (TBI), to caregivers' positive and negative affect.

Setting: Community.

Participants: One hundred sixty-five caregivers of service members/veterans with TBI.

Design: Retrospective database analysis.

Main Measures: TBI-CareQOL Emotional Suppression; TBI-CareQOL Caregiver Vigilance; measures of negative (Patient-Reported Outcomes Measurement Information System [PROMIS] Depression, PROMIS Anger, TBI-CareQOL Caregiver-Specific Anxiety, National Institutes of Health Toolbox [NIHTB] Perceived Stress, GAD-7) and positive affect (Neuro-QOL Positive Affect and Well-being, NIHTB Self-efficacy, NIHTB General Life Satisfaction, Family Resilience Scale for Veterans, TBI-QOL Resilience).

Results: When considered separately, linear regression showed that higher levels of Emotional Suppression and greater Caregiver Vigilance were individually associated with more negative affect and less positive affect. When considered together, the pattern of findings was generally consistent for both Emotional Suppression and Caregiver Vigilance with regard to negative affect and for Emotional Suppression with regard to positive affect. However, when considered together, Caregiver Vigilance was no longer related to positive affect.

Conclusions: Caregivers with high emotional suppression and/or vigilance are more likely to show emotional distress and less likely to have positive affect than caregivers with lower levels of

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emotional suppression and vigilance. A combination of education and individual counseling targeting coping with negative emotions and TBI-related problems may be beneficial.

Keywords

caregiver; health-related quality of life; service members; traumatic brain injury; veterans

NEGATIVE AFFECT, including depression and anxiety, occurs in a substantial portion of caregivers of persons with traumatic brain injury (TBI).^{1–3} While much of this evidence has come from samples of caregivers of civilians with TBI, recent research has documented the impact of caring for a service member or veteran (SMV) with TBI. At a median of 4 years after injury, more than half of caregivers of SMVs from Operation Enduring Freedom/Operation Iraqi Freedom reported that persons with TBI needed their assistance with management of emotions and with obtaining healthcare, benefits, and legal aid.⁴ More than one-third of SMVs with TBI required their caregivers' help with making medical appointments, managing pain, and utilizing therapy or assistive devices. Caregivers of SMVs with TBI report high levels of perceived burden,^{5,6} poor mental health,^{5–8} poor physical health,^{6,7} and reduced quality of life (QOL).⁹ These caregivers also report a variety of health-related difficulties, including sleep disturbance, feelings of being overwhelmed, difficulty with emotional adjustment, and feeling confined.⁷ Furthermore, the percentage of caregivers with clinically significant depressive symptoms has been found to be nearly double for those caring for SMVs with TBI compared with those caring for civilians with TBI.⁷

Unique aspects of caring for an SMV with TBI may help explain negative impact on physical and mental health. Caregivers of SMVs who sustained TBI during service after September 11, 2011 (9–11-01), are more likely caring for someone with co-occurring body system injuries, and caregivers with such injuries tend to experience greater emotional distress than those caring for persons with TBI alone.¹⁰ Caregivers of SMVs injured post-9–11-01 are also more likely to be caring for SMVs who require assistance for posttraumatic stress disorder (PTSD) and other mental health problems.⁷ In a recent study, Brickell and colleagues⁸ found that 62.5% of their sample of 264 caregivers of SMVs with TBI perceived that they needed help providing emotional support to their SMV and 47.7% of caregivers reported that this need was unmet. Many caregivers of SMVs who were injured post-9–11-01 report significant financial stress, including loss of financial savings and assets due to medical care and services for the injured SMV.^{6,11} This stress is compounded by the fact that many caregivers report that they are unable to work due to caring for their SMV.^{6,7,11}

In preparation for developing a health-related QOL measure for caregivers of persons with TBI, Carlozzi and colleagues¹² conducted a series of focus groups with 45 caregivers of SMVs with TBI. A high number of participants verbalized that they spend a great deal of effort suppressing emotion on a daily basis. These caregivers described feeling the need to present a brave face to others, even when they are feeling stressed or sad. A substantial percentage of caregivers of these SMVs also reported daily hypervigilance, or feeling the need to be alert to things in the environment or to the behavior of others that could potentially trigger their SMV to have a negative reaction. These caregivers described efforts

to control the environment in order to avoid a negative reaction in their SMV. Because of the number of caregivers who raised these concerns, Carlozzi and colleagues developed item banks to assess emotional suppression and caregiver vigilance. These item banks have been validated in a sample of 534 persons with TBI, and the results are currently under review for another journal issue.

The impact of emotional suppression and hypervigilance on caregivers' emotional functioning has not been investigated, although they have the potential to negatively impact mental health. Healthy management of emotions is important for maintaining optimal mental health and promoting maximal functioning in daily life. Research on emotional regulation indicates that people tend to use 1 of 3 strategies to regulate emotions and that these strategies have differential effects on affect and well-being. Reappraisal (reframing how one thinks about a situation) and distraction (directing attention away from a negative situation and toward a positive one) are generally associated with greater positive emotion, less negative emotion, and greater well-being.^{13–15} Both of these occur early during emotional processing and are targeted toward changing the experience of emotions. In contrast, emotional suppression occurs after a person experiences an emotion and inhibits its behavioral expression.¹⁴ The behavioral suppression does not decrease the subjective experience of the emotion.^{14,16} Indeed, it can create a perceived discrepancy between a person's inner feelings and his or her presentation to others, which can lead to further negative feelings.¹⁴

Suppression of negative emotions has been demonstrated to be accompanied by increased cardiovascular and sympathetic nervous system activity.^{17,18} In laboratory settings, emotional suppression has been shown to be associated with decreased ability to cognitively process aspects of the social environment.^{19–22} For example, people recalled fewer details of a conversation when instructed to suppress emotion than when instructed to reappraise or to act naturally. Emotional suppression is also associated with negative physiological effects (eg, increased blood pressure) in individuals who are conversing with the suppressor.²³ Suppression of emotion is also related to decreased positive affect,^{13,24–26} increased intake of food for comfort/emotion,^{27,28} and lower life satisfaction.^{13,26,29} In contrast to the laboratory findings, a recent community-based study, in which participants used real-time recording of affect and regulation strategies in response to daily stressors, found that use of emotional suppression was not related to positive or negative affect.¹⁵ This study used a self-report diary of ongoing daily stressful life events and whether they used reappraisal, distraction, or suppression to deal with them. Differences in findings compared with laboratory-based studies may be due to the fact that participants in the community-based study responded to everyday perceived stressful events, and these events differed across participants and within participants across days.

Hypervigilance is a state of heightened alertness and sensitivity to one's surroundings. The impact of hypervigilance on health and functioning is not clear based on research. In a nonclinical sample, instructions to be hypervigilant in looking for threats in a series of video images, in order to avoid loud white noise, resulted in increased pupil size and increased visual scanning relative to neutral and pleasant target detection conditions, but there was no difference in actual anxiety reported.³⁰ Hypervigilance is a symptom of several mental

health conditions, including PTSD, anxiety, and paranoid schizophrenia. There is evidence that PTSD is associated with overactivity of the amygdala and its connections to the insula and that this overactivity can impact the medial prefrontal cortex, reducing a person's ability to regulate negative emotion and perceive things positively.³¹ Therefore, hypervigilance has the potential to impact caregivers' perceptions of situations as positive or negative and to affect their reported emotions.

The current study investigates the relationship of emotional suppression and hypervigilance to negative and positive affect in caregivers of veterans or service members of persons with TBI. It was hypothesized that both emotional suppression and hypervigilance would be associated with greater negative affect and lesser positive affect.

METHODS

Participants

In total, 165 caregivers of SMVs with TBI were included in this analysis. Participants were a subset of participants from a multisite measurement development study (218 caregivers of civilians and 316 caregivers of SMVs with TBI).³² As this analysis was focused on military caregivers, only data collected from caregivers of SMVs with TBI were included. For institutional reasons, one of the military data collection sites did not collect data on many of the affect measures. Therefore, participants in the current analysis were the 165 who were recruited at 2 of 5 data collection sites (the James A. Haley Veterans' Hospital and the University of Michigan). Caregivers at these sites were recruited through hospital patient databases, site-specific research registries, and community outreach, including a nation-wide military caregiver support organization. Caregivers had to be at least 18 years of age, caring for someone with TBI at least 1 year prior and documented by a Department of Veterans Affairs or Department of Defense facility, able to understand and read English, and providing at least some daily assistance to the person with TBI (eg, help with medication or financial management, housework, dressing). Participants were not required to provide medical records for their SMV, as this study was conducted as a community outreach effort. However, caregivers were required to provide documentation from the Department of Veterans Affairs or Department of Defense listing a service-connected TBI. As this documentation is not sufficient for determining severity of the injury, TBI severity was missing for 56.6% of the sample.

Procedure

The research protocol for the parent study was approved by the institutional review boards at the University of Michigan and at the James A. Haley Veterans' Hospital. All participants who were contacted and agreed to participate were provided with a username and password to an online patient-reported outcomes survey housed on Assessment Center (<https://www.assessmentcenter.net>). Participants accessed the survey from a personal or public computer with an Internet connection and completed the survey at their own pace. The survey included all TBI-CareQOL item banks and multiple criterion measures, including measures of positive and negative affect (described later). The following measures were included in the current analyses:

Demographics—Caregivers answered questions pertaining to their own gender, age, race/ethnicity, education, years in the caregiving role, and relationship to the person with injury. In addition, they answered demographic questions regarding the age and gender of the person they cared for and whether the injury was combat-related or not.

TBI-CareQOL Emotional Suppression item bank—These items assess caregivers' attempts to hide or suppress negative feelings while acting in the caregiver role. They were developed according to established measurement development standards³³ and generated on the basis of qualitative data from focus groups conducted in caregivers of civilians and SMVs with TBI.³⁴ Items underwent expert review, cognitive interviews with caregivers of civilians and caregivers of SMVs with TBI, reading-level assessment, and Spanish translatability review. The final item pool was tested in a larger sample of 534 participants. Classical test theory and item response theory (IRT)-based analytical approaches were used for development. Exploratory factor analysis, confirmatory factor analysis (CFA), and Samejima's graded response model³⁵ were used to identify a unidimensional set of items. Items were excluded if there were sparse cells,^{36,37} if the item-adjusted total score correlation was less than 0.40,³⁶ and they were nonmonotonic, displayed significant item misfit ($S-X^2$ item fit index, $P < .01$), or exhibited differential item functioning for age, education, or caregiver status (civilian vs SMV). The final item bank comprises 21 items. Firestar simulation software was used to simulate computer adaptive test (CAT) scores.³⁸ Items are rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Scores are on a T-metric with a mean of 50 (SD = 10). Higher scores represent more emotional suppression. Data from validation of the measure (under review) support construct validity (CFA CFI = 0.95) and marginal reliability (ie, IRT-based internal consistency $\alpha = .92$), as well as convergent and discriminant validity (as supported by strong correlations with measures of burden and mental health and low correlations with physical health and satisfaction).

TBI-CareQOL Caregiver Vigilance item bank—These items assess caregivers' feelings of anxiety, hyperarousal, and/or vigilance related to concerns about the emotional and behavioral status of the person with TBI. Items were developed on the basis of established measurement development standards according to the process outlined earlier for Emotional Suppression.³³ Firestar simulation software was used to simulate CAT scores.⁷ The final item bank comprises 18 items. Item ratings and score metrics are the same as those for Emotional Suppression. Data from validation of the measure (under review) support construct validity (CFA CFI = 0.96) and marginal reliability (ie, IRT-based internal consistency $\alpha = .95$), as well as convergent and discriminant validity (as supported by strong correlations with measures of burden and anxiety and low correlations with physical health and satisfaction).

Measures of Negative Affect

Patient-Reported Outcomes Measurement Information System (PROMIS) Depression item bank³⁹: This computer adaptive test was used to examine depressed mood, views of self, and decreased engagement. Items are rated from 1 (never) to 5 (always). Scores are on a T-metric with a mean of 50 (SD = 10). Higher scores indicate more depression.

PROMIS Anger item bank³⁹: This computer adaptive test measures angry mood, disagreeability, and efforts to control one's anger. Items are rated from 1 (never) to 5 (always) on a 5-point Likert-type scale. Scores are on a T-metric with a mean of 50 (SD = 10). Higher scores represent more anger.

General Anxiety Disorder 7-item (GAD-7)⁴⁰: This scale contains 7 questions pertaining to feelings of nervousness, worry, and trouble relaxing. Each item is rated from 0 (not at all) to 3 (nearly every day), and scores range from 0 to 21. Higher scores indicate more anxiety.

National Institutes of Health Toolbox (NIHTB) Perceived Stress Scale⁴¹: This is a 10-item calibrated short form that measures stress and ability to control stressors. Items are rated from 1 (never) to 5 (very often), and raw scores are converted to the T-metric (mean = 50; SD = 10). Higher scores indicate more perceived stress.

TBI-CareQOL Caregiver-Specific Anxiety item bank⁴²: This computer adaptive test examines caregiver concerns about the person they care for with regard to behavior in public, mental health, mood, and fear for the future. Items are on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Scores are on a T-metric with a mean of 50 (SD = 10). Higher scores indicate more caregiver-specific anxiety.

Measures of positive affect

Neuro-QOL Positive Affect and Well-being item bank⁴³: This computer adaptive test measures enjoyment, hope, and purpose on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Scores are on a T-metric with a mean of 50 (SD = 10), and higher scores indicate more positive affect.

NIHTB Self-efficacy⁴¹: This computer adaptive test measures an individual's belief in his or her ability to control and manage events that happen in his or her daily life. Items are rated from 1 (never/almost never) to 4 (very often). Scores are on a T-metric (mean = 50; SD = 10). Higher scores indicate more self-efficacy.

NIHTB General Life Satisfaction⁴¹: This computer adaptive test measures satisfaction with life experiences and content with current life. Items are rated from 1 (strongly disagree) to 5 (strongly agree) and are scored on a T-metric (mean = 50; SD = 10). Higher scores represent greater life satisfaction.

TBI-QOL Resilience⁴⁴: This 8-item short form assesses emotional balance, adaptation to difficult situations, and overcoming challenges. Items are rated on a Likert-type scale from 1 (never) to 5 (always). Resulting scores are on a T-metric with a mean of 50 (SD = 10). Higher scores indicate more resilience.

Family Resilience Scale for Veterans^{45,46}: This 6-item scale measures ability for the family unit to overcome challenges or solve problems. Each item is rated from 1 (strongly disagree) to 4 (strongly Agree). Possible scores range from 6 to 24, with higher scores indicating greater family resilience.

Data analysis

Demographic variables were calculated using means and standard deviations (for continuous variables) and frequency analyses (for categorical variables). All measures of affect, as well as Emotional Suppression and Caregiver Vigilance, were assessed for skewness; an absolute skewness or kurtosis value of |2| was determined as a cutoff for parametric analyses using George and Mallery's⁴⁷ criteria. The largest amount of skewness was for the GAD-7 (skewness = 0.70), and the largest kurtosis was for Caregiver-Specific Anxiety (kurtosis = 1.11), thus indicating that parametric analyses were acceptable. Pearson correlation coefficients were examined between Emotional Suppression, Caregiver Vigilance, and each measure of affect. Next, linear regression was used to determine the relationship of Emotional Suppression and Caregiver Vigilance to measures of affect. The first two models had either Emotional Suppression (model 1) or Caregiver Vigilance (model 2) as predictors of the various measures of negative and positive affect. The third model included both Emotional Suppression and Caregiver Vigilance, along with relevant covariates (age, gender, and education-less than high school, some college, college graduate or greater). The variance inflation factor (VIF) was calculated for each of the predictors in the third model, with a cutoff of 5 for the VIF indicating unacceptable collinearity.⁴⁸ Given that the largest VIF for model 3 was 1.49 (for Caregiver Vigilance), collinearity was not an issue. To determine effect size of the primary predictor variables, the partial eta-squared effect size (η_p^2) was used.⁴⁹ Partial eta-squared sizes of 0.01 or more were considered small, 0.06 or more were considered moderate, and 0.14 or more were considered large.⁴⁹ Finally, impairment rates were calculated for measures that are scoreable on a T-metric, including Caregiver Vigilance, Emotional Suppression, and the Negative and Positive Affect measures. Previous research using vignettes and clinical expertise ratings of impairment has found that patient-reported outcome scores 1 SD above (T-score = 60; for Negative Affect measures) or below (T-score = 30; for Positive Affect measures) the mean commonly indicate moderate to severe symptoms.^{50–52} Chi-squared analyses were conducted comparing impairment rates for Caregiver Vigilance and Emotional Suppression with the Negative Affect and Positive Affect measures to determine whether moderate to severe affect was related to increased Vigilance and Suppression severity.

RESULTS

One hundred sixty-five caregivers were examined for the current analysis. The average T-score for Emotional Suppression was 50.0 (SD = 9.7; 25th percentile = 44.3; 75th percentile = 56.8; range, 21–78). The average score for Caregiver Vigilance was 50.1 (SD = 9.8; 25th percentile = 44.6; 75th percentile = 56.8; range, 25.8–76.5). Further descriptive data can be found in Table 1.

Emotional Suppression and Caregiver Vigilance each had small to moderate correlations with the measures of affect (see Table 2). With the exception of NIHTB Self-efficacy, *P* values for the correlations were all significant (*P* < .05).

Model 1

As shown in Table 3, a higher level of Emotional Suppression was associated with higher levels of negative affect for all measures. There were small effect sizes for Anger, moderate effect sizes for Depression, GAD-7, and Perceived Stress, and a large effect size for Caregiver-Specific Anxiety. A higher level of Emotional Suppression was associated with lower levels of positive affect for all measures. There were small effect sizes for general resilience (TBI-QOL Resilience), Self-efficacy, and Family Resilience, and moderate effect sizes for Positive Affect and Well-being and General Life Satisfaction.

Model 2

Table 3 shows that greater Caregiver Vigilance was associated with more negative affect. Effect sizes were generally moderate, except for Caregiver-Specific Anxiety, which had a large effect size. Greater Caregiver Vigilance was also associated with less positive affect for all measures except for general resilience and Self-efficacy. The effect sizes were small in all cases-for Positive Affect and Well-being, Family Resilience, and General Life Satisfaction.

Model 3

When combined in the same model, Emotional Suppression and Caregiver Vigilance were generally associated with negative affect, and Emotional Suppression was generally associated with positive affect (see Table 4). Caregiver Vigilance was not associated with positive affect. Both Emotional Suppression and Caregiver Vigilance generally had small to moderate effect sizes for negative affect. Emotional Suppression had small effect sizes for positive affect (see Table 4).

The proportion of caregivers scoring in the impaired range on the Emotional Suppression and Caregiver Vigilance scales was 16.4% and 20.6%, respectively. In general, severity of negative or positive affect was unrelated to impairment on Caregiver Vigilance or Emotional Suppression (see Table 5). There were a few exceptions, as participants with moderate to severe caregiver-specific anxiety were impaired on measures of Caregiver Vigilance and Emotional Suppression. Moderate to severe symptoms on the PROMIS Depression and NIHTB General Life Satisfaction measures were related to impaired emotional suppression.

DISCUSSION

Prior qualitative research has demonstrated that caregivers of SMVs with TBI report use of emotional suppression and vigilance to cope with the impact of the injury on their daily lives.¹² Current findings indicate that their use of emotional suppression is associated with greater negative affect and less positive affect. This is consistent with studies on emotion regulation in normal populations, which have shown that emotional suppression is associated with less positive emotion and well-being and with greater negative emotion.^{13–15} The current findings expand the more general findings about emotion regulation to caregivers of SMVs with TBI. To our knowledge, this is the first study to investigate this issue in the population of caregivers of SMVs with TBI. There has been less prior research on the relationship of hypervigilance to affect in the general population, but there is evidence that hypervigilance is associated with several mental health conditions. The association of

hypervigilance with negative affect in the current study makes sense in light of the fact that hypervigilance is a symptom of mental health difficulties.

Caregivers of SMVs with TBI face unique stress associated with co-occurring polytrauma injuries and mental health conditions, such as PTSD. Attempts to manage one's emotions are normal when faced with a stressful situation. Caregivers of SMVs with TBI may attempt to suppress their emotions for a variety of reasons, including to focus their time and energy on helping the SMV, to protect the SMV from seeing the impact of the injury on them (the caregiver), or to simply avoid confronting their emotions. They may engage in hypervigilance in an attempt to control the environment to avoid negative reactions from the SMV and/or to protect the SMV from physical and psychological harm. The current study indicates that these means of managing emotions can be costly to caregivers and may contribute to emotional distress and decreased well-being. Both emotional suppression and hypervigilance appear to be maladaptive, as they are associated with higher levels of negative affect, which may place the caregiver at greater risk for emotional distress and/or psychological difficulties.

Similarly, use of emotional suppression places caregivers at risk for less positive emotions. These results suggest that caregivers who attempt to manage their emotions via suppression could be less likely to experience the full range of positive emotions that make life enjoyable and rewarding. They may not engage in pleasurable activities in a manner that helps buffer depression and anxiety. It is possible that caregivers who suppress their emotions and are more vigilant may spend more time focusing on management of their SMV's life rather than maintaining a balanced life for themselves. This possibility is supported by evidence from the general emotion regulation literature that use of emotional suppression is related to lower life satisfaction.^{13,26,29} Consistent with these findings, persons with impairment on the Emotional Suppression measure in the current study had moderate to severe life dissatisfaction.

Findings may have therapeutic value to rehabilitation providers who can use the CareQOL Emotional Suppression and Vigilance item banks to target caregiver education and treatment. Caregivers may benefit from education about healthy expression of emotion and why suppression of emotion can be unhealthy. Training in mindfulness and acceptance of emotions may be beneficial. The potential role of the military culture in supporting use of emotional suppression should be considered, and caregivers may benefit from support groups with other caregivers to express emotion in a safe environment. Caregivers may also benefit from education regarding the potential negative effects of hypervigilance and teaching of effective planning and problem solving in regard to managing neurobehavioral problems in the SMV with TBI. In addition, scheduling pleasant activities for the caregiver may allow for a break from these concerns and allow them to pursue a more balanced approach to life and to work through their thoughts and feelings.

STUDY LIMITATIONS

While this study offers several insights into the relationship of emotional suppression and vigilance to negative and positive affect in caregivers of SMVs with TBI, it is also important

to acknowledge study limitations. The statistical relationships found may have limited clinical utility. Actual impairment levels on the Emotional Suppression and Caregiver Vigilance measures were related to moderate to severe clinical symptom severity for only a few measures, although in the expected direction on these measures. The study did not include data on comorbid psychiatric conditions (eg, PTSD) that could influence affect and/or moderate the relationship between suppression or vigilance and affect. Participants represented a community-dwelling caregiver sample, which resulted in some missing data for TBI severity, precluding the ability to covary for injury severity. In addition, findings are specific to caregivers who have been in the caregiver role for an average of 7.2 years and thus findings cannot be generalized to caring for SMVs during the early stages of recovery from TBI. Finally, other factors not investigated in this study, such as coping strategies and cultural issues, may moderate the relationship between use of suppression or vigilance and affect. Future studies should investigate these more complex relationships.

CONCLUSION

Current findings suggest that high use of emotional suppression and/or vigilance by caregivers of SMVs contributes to more negative affect and that greater emotional suppression is associated with less positive affect. A combination of education and individual counseling targeting healthy emotion regulation and systematic problem-solving of injury-related difficulties may improve emotional health for caregivers of SMVs. Furthermore, such caregiver-focused interventions may have an indirect benefit on the outcomes of the SMV with TBI.

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TABLE 1

Demographics for caregivers of SMVs

N = 165	
Age	
Mean (SD)	43.7 (13.3)
Gender, %	
Male	6.0
Female	94.0
Race, %	
White	84.9
Black	6.0
Other	9.1
Ethnicity, %	
Not Hispanic/Latino	89.7
Hispanic/Latino	11.1
Education, %	
Less than high school/GED	5.0
High school	9.0
Some college	47.6
Bachelor's or higher	38.4
Years in caregiving role	
Mean (SD)	7.2 (3.4)
Relationship to person with injury, %	
Spouse/partner	72.9
Parent	19.9
Other family	4.8
Other	2.4
Age of SMV	
Mean (SD)	39.7 (10.0)
Gender of SMV, %	
Male	96.4
Female	3.6
How was injury acquired? %	
Combat-deployed, combat-related	54.9
Combat-deployed, non-combat-related	7.3
Non-combat-deployed, non-combat-related	6.1
Not deployed at time of injury	26.8
Not sure of deployment	4.9
Severity, %	
Mild	1.2
Complicated mild	2.4
Moderate	5.4

<i>N</i> = 165	
Severe	25.9
Penetrating	8.4
Unknown	56.6
PROMIS Depression	
Mean (SD)	54.8 (9.3)
GAD-7 score	
Mean (SD)	7.2 (5.6)
PROMIS Anger	
Mean (SD)	53.7 (10.3)
NIHTB Perceived Stress	
Mean (SD)	52.7 (12.1)
TBI-CareQOL Caregiver-Specific Anxiety	
Mean (SD)	56.4 (8.1)
Neuro-QOL Positive Affect and Well-being	
Mean (SD)	51.1 (6.9)
TBI-QOL Resilience	
Mean (SD)	48.7 (8.4)
NIHTB Self-efficacy	
Mean (SD)	51.1 (9.9)
Family Resilience Scale for Veterans	
Mean (SD)	18.3 (2.8)
NIHTB General Life Satisfaction	
Mean (SD)	47.5 (9.5)

Abbreviations: GAD-7, General Anxiety Disorder 7-item; NIHTB, National Institutes of Health Toolbox; PROMIS, Patient-Reported Outcomes Measurement Information System; QOL, quality of life; SMV, service member or veteran; TBI, traumatic brain injury.

TABLE 2
Pearson correlations between Emotional Suppression, Caregiver Vigilance, and measures of affect^a

	PROMIS Depression	GAD-7 score	PROMIS Anger	NIHTB Perceived Stress	TBI-CareQOL Caregiver-Specific Anxiety	Neuro-QoL Positive Affect and Well-being	TBI-QoL Resilience	NIHTB Self-efficacy	Family Resilience Scale for Veterans	NIHTB General Life Satisfaction
Emotional Suppression	0.35	0.35	0.29	0.41	0.44	-0.28	-0.26	-0.23	-0.26	-0.29
Caregiver Vigilance	0.36	0.39	0.41	0.38	0.49	-0.23	-0.21	-0.08 ^b	-0.23	-0.21

Abbreviations: GAD-7, General Anxiety Disorder 7-item; NIHTB, National Institutes of Health Toolbox; PROMIS, Patient-Reported Outcomes Measurement Information System; QoL, quality of life; TBI, traumatic brain injury.

^a All *P* values are less than .05 unless otherwise indicated.

^b *P* > .05.

TABLE 3
Relationship between Emotional Suppression, Caregiver Vigilance, and measures of affect^a

	Model 1			Model 2		
	Emotional Suppression β (SE)	t	η_p^2	Caregiver Vigilance β (SE)	t	η_p^2
Negative Affect						
PROMIS Depression	.26 (0.07)	3.73	0.08	.25 (0.08)	3.07	0.06
GAD-7 score	.17 (0.04)	3.95	0.09	.20 (0.05)	4.11	0.10
PROMIS Anger	.24 (0.08)	3.03	0.05	.36 (0.09)	4.10	0.10
NIHTB Perceived Stress	.40 (0.08)	4.75	0.13	.33 (0.10)	3.24	0.07
TBI-CareQOL Caregiver-Specific Anxiety	.31 (0.06)	5.28	0.15	.38 (0.07)	5.84	0.18
Positive Affect						
Neuro-QOL Positive Affect and Well-being	-.19 (0.06)	-3.36	0.07	-.16 (0.06)	-2.54	0.04
TBI-QOL Resilience	-.20 (0.07)	-2.90	0.05	-.14 (0.08)	-1.74	0.02
NIHTB Self-efficacy	-.20 (0.08)	-2.42	0.04	-.01 (0.09)	-0.15	0.00
Family Resilience Scale for Veterans	-.06 (0.02)	-2.74	0.05	-.06 (0.03)	-2.31	0.03
NIHTB General Life Satisfaction	-.27 (0.08)	-3.50	0.08	-.18 (0.09)	-2.09	0.03

Abbreviations: GAD-7, General Anxiety Disorder 7-item; NIHTB, National Institutes of Health Toolbox; PROMIS, Patient-Reported Outcomes Measurement Information System; QOL, quality of life; TBI, traumatic brain injury.

^a All models control for age, gender, and education of caregiver. η_p^2 effect sizes are small at 0.01, moderate at 0.06, and large at 0.14.

^b Indicates that overall adjusted model was insignificant ($P > .05$).

TABLE 4

Relationship between Emotional Suppression, Caregiver Vigilance, and affect when Emotional Suppression and Caregiver Vigilance are both included in the model^a

	Emotional Suppression β (SE)		t	η^2_p	P	Caregiver Vigilance β (SE)		t	η^2_p	P
Negative Affect										
PROMIS Depression	.20	(0.08)	2.62	0.04	.01	.14	(0.09)	1.62	0.02	.11
GAD-7 score	.11	(0.05)	2.38	0.04	.02	.14	(0.05)	2.63	0.04	.009
PROMIS Anger	.12	(0.09)	1.41	0.01	.16	.30	(0.10)	3.03	0.06	.003
NIHTB Perceived Stress	.34	(0.09)	3.61	0.08	.0004	.14	(0.11)	1.32	0.01	.19
TBI-CareQOL Caregiver-Specific Anxiety	.20	(0.06)	3.15	0.06	.002	.28	(0.07)	3.93	0.09	.0001
Positive Affect										
Neuro-QOL Positive Affect and Well-being	-.15	(0.06)	-2.46	0.04	.02	-.08	(0.07)	-1.18	0.01	.24
TBI-QOL Resilience	-.18	(0.08)	-2.35	0.04	.02 ^b	-.04	(0.09)	-0.51	0.00	.61 ^b
NIHTB Self-efficacy	-.24	(0.09)	-2.63	0.04	.009 ^b	.11	(0.10)	1.05	0.01	.29 ^b
Family Resilience Scale for Veterans	-.05	(0.02)	-1.89	0.02	.06	-.03	(0.03)	-1.22	0.01	.23
NIHTB General Life Satisfaction	-.24	(0.09)	-2.83	0.05	.005	-.06	(0.10)	-0.61	0.00	.54

Abbreviations: GAD, General Anxiety Disorder 7-item; NIHTB, National Institutes of Health Toolbox; PROMIS, Patient-Reported Outcomes Measurement Information System; QOL, quality of life; TBI, traumatic brain injury.

^a All models control for age, gender, and education of caregiver. η^2_p effect sizes are small at 0.01, moderate at 0.06, and large at 0.14.

^b Indicates that overall model was insignificant ($P > .05$).

TABLE 5
Symptom severity on measures of affect and well-being by Caregiver Vigilance and Emotional Suppression impairment categories^a

	Caregiver Vigilance			Emotional Suppression		
	Nonimpaired (n = 131), %	Impaired (n = 34), %	χ^2	Nonimpaired (n = 138), %	Impaired (n = 27), %	χ^2
<i>Negative Affect</i>						
PROMIS Depression			0.74			4.08 ^b
Nonimpaired	76.2	68.8		77.8	59.3	
Impaired	23.8	31.2		22.2	40.7	
PROMIS Anger			2.63			1.29
Nonimpaired	74.8	60.6		73.7	63.0	
Impaired	25.2	39.4		26.3	37.0	
NIHTB Perceived Stress			2.88			2.79
Nonimpaired	75.4	60.6		75.0	59.3	
Impaired	24.6	39.4		25.0	40.7	
TBI-CareQOL Caregiver-Specific Anxiety			13.25 ^b			7.79 ^b
Nonimpaired	74.1	41.2		71.9	44.4	
Impaired	25.9	58.8		28.1	55.6	
<i>Positive Affect</i>						
Neuro-QOL Positive Affect and Well-being			0.73			1.39
Nonimpaired	94.7	90.6		94.9	88.9	
Impaired	5.3	9.4		5.2	11.1	
TBI-QOL Resilience			0.00			1.18
Nonimpaired	84.7	84.4		86.0	77.9	
Impaired	15.3	15.6		14.0	22.2	
NIHTB Self-efficacy			1.21			0.00
Nonimpaired	83.2	90.9		84.7	85.2	
Impaired	16.8	9.1		15.3	14.8	
NIHTB General Life			0.59			5.84 ^b
Satisfaction						
Nonimpaired	83.9	78.1		85.9	66.7	

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Impaired	Caregiver Vigilance		Emotional Suppression		χ^2
	Nonimpaired (<i>n</i> = 131), %	Impaired (<i>n</i> = 34), %	Nonimpaired (<i>n</i> = 138), %	Impaired (<i>n</i> = 27), %	
	16.1	21.9	14.1	33.3	

Abbreviations: χ^2 , chi-squared statistic; GAD, General Anxiety Disorder 7-item; NIHTB, National Institutes of Health Toolbox; PROMIS, Patient-Reported Outcomes Measurement Information System; QOL, quality of life; TBI, traumatic brain injury.

^aImpairment is defined as scores 1 SD higher (for Negative Affect) or lower (for Positive Affect) than 50. GAD-7 and Family Resilience Scale for Veterans are not on a T-metric and thus were not included in this analysis.

^b*P* < .05.