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# Cohesion, Burnout, and Past Trauma in Tri-Service Medical and Support Personnel

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**Past research suggests that the negative consequences related to exposure to traumatic events and injury may impact cohesive work relationships. Additionally, trauma and low cohesive relationships independently predict poorer psychological and physical health in service members. The objective of the present study was to examine the interrelationships between exposure to traumatic events, burnout, and cohesion among tri-service medical and support staff. Surveys were administered to 253 U.S. Army, Army Reserve Units, U.S. Air Force, and U.S. Navy personnel upon arrival in Hawaii for participation in a stressful, 2-week training exercise. Results showed that history of trauma was correlated with poorer view of officers and higher levels on two components of burnout. We discuss how findings can apply to prevention and early intervention efforts.**

## Introduction

The U.S. military is composed of a variety of units, large and small, that must quickly adapt to perform widely varying missions. Across missions, the success of each group often depends on a cohesive effort among individuals. Typically, individual service members are required to form group alliances quickly and work together effectively. Most individuals are able to form cohesive group bonds with peers and effective relationships with their leaders. These individuals are perceived as helpful to the group effort and tend to be rewarded. However, individuals who have problems working in group settings are often disregarded by peers and superiors. Poor cohesion tends to perpetuate poor performance and ultimately can lead to career advancement difficulty.

Regardless of institution, positive interpersonal relationships are fundamental in achieving organizational goals.[1] Several lines of research have indicated that the extent to which group members feel a part of a group and desire to remain in the group predicts stronger performance at the group level.[1-5] Additionally, group cohesion is consistently related to perceptions of job satisfaction, a sense of well-being, and lower levels of disciplinary problems.[6] Therefore, there is a need to identify factors that correlate with group cohesion and those that may predict which individuals will be most capable of forming cohesive bonds.

Few studies have examined the impact that traumatic stress exposure can have upon group cohesion. However, there is reason to believe that trauma might impair work-related relationships. Among the widely varying correlates of trauma exposure, sequelae may include emotional numbing and chronic anger,[7,8] a belief that the world is a malevolent place,[9] and impaired interpersonal relationships.[10-12] A study of 1,365 U.S. Army soldiers[13] showed that soldiers who were sexually and physically/emotionally maltreated as children reported poorer perception of officers, noncommissioned officers (NCOs), and their peers. This group[14] also showed that report of trauma and unit cohesion independently predicted poorer psychological and physical health among soldiers. Overall, these findings provide reason to believe that the negative consequences related to trauma may impact cohesive work relationships.

Attachment theory has been used to explain the sequelae of trauma. Attachment refers to one's set of expectations about relationships, based on expectations developed from previous experiences with relationships.[15] When previous relationships are warm and responsive to an individual's needs, the individual will develop a "secure" attachment style. In secure attachments, future relationships are expected to provide warmth and responsivity, and the individual sees others as trustworthy. When previous relationships are not responsive to the individual's needs, the individual will develop an "insecure" attachment style. Such an individual tends to see others as untrustworthy, nonresponsive, and in some cases, abusive.

A traumatic experience can have a major impact on attachment ability.[12] Insecure adult attachment style is more likely in those who have trauma histories and post-traumatic stress disorder (PTSD) symptoms, including combat veterans and prisoners of war.[16-18] McFarlane and Bookless[12] propose that interpersonal trauma can become embedded in the memory structure of an individual, leading him/her to avoid other people. Because secure attachment ability is a necessary foundation for healthy interpersonal relationships, trauma exposure may lead individuals to become distrustful of others and avoid social interactions. Moreover, social situations may become associated with the trauma, thus serving as a trigger for intrusive memories of the event and other trauma symptoms. When traumatic events are work related, such events may also lead individuals to feel betrayed by the "system" that they expected to protect them. Such an impact would then likely impact cohesion with peers and leaders.

A second work-related factor that may be impacted by trauma is burnout. Burnout is a particular form of occupational stress that refers to how poorly a person is coping, reflecting both the

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cumulative amount of job stress a person can handle and the effectiveness of his or her coping style.[19] Drawing from extant quantitative and qualitative research, Maslach[20] proposed that the burnout construct consists of three separate but interrelated dimensions: emotional exhaustion, depersonalization, and personal accomplishment. The first factor, emotional exhaustion, refers to the depletion or draining of physical, mental, and emotional resources.[21] Depersonalization refers to a lack of enthusiasm for one's work and cynicism that one's work does not contribute to a meaningful goal.[20] The third factor, personal accomplishment, refers to a feeling of productivity and fulfillment related to one's work role.[21] Thus, individuals who suffer burnout tend to feel ineffectual, have cynical attitudes, and have little energy to contribute to their organization.

Research is needed that examines trauma's role in burnout. One recent study[22] examined the association between "critical incidences" and burnout among ambulance personnel in the United Kingdom. High scores on the emotional exhaustion subscale were associated with more frequent exposure to traumatic incidents, as well as less recovery time between critical incidents. Low scores on the personal accomplishment subscale were correlated with longer length of service and less recovery time between incidents. Depersonalization was more common in those who said they experienced a particularly disturbing critical incident in the previous 6 months. The authors conclude that cumulative exposure that can occur in emergency work can promote burnout through several pathways.

Burnout also may have its own impact on workplace cohesion.[23,24] In a group of 473 Canadian forces service members from various military occupations, Leiter et al[23] showed that both high emotional exhaustion scores and low personal accomplishment scores correlated with poorer work group cohesion (depersonalization was not included in the analyses because that subscale was deemed by the authors as inappropriate for populations who are not human service professionals). Because the impact of burnout can alienate an individual from others in a group, the consequences of burnout upon work performance can be serious.

Based upon the growing research literature, we developed a theoretic model identifying potential relationships between trauma, burnout, and cohesion. Our model proposes that the difficulties resulting from trauma exposure may lead to poorer cohesion either directly or through burnout symptoms. In the present study, we evaluated the relationships between cohesion, burnout, and trauma. First, we tested the hypothesis that trauma exposure is related to lower cohesion scores. Second, we tested the hypothesis that individuals with trauma exposure report significantly higher levels of burnout than those with no trauma exposure. Last, we tested the hypothesis that an individual's level of burnout, as measured by the three Maslach Burnout Inventory (MBI) subscales, is related to lower cohesion scores. Military personnel were chosen as participants for the study because of their exposure to a complex mix of stressors in the course of their duties,[25] such as chronic high demands for performance, environmental demands (cold, heat, or altitude stress), accidents, sexual assault, and exposure to combat. Service members also report high levels of traumatic stressors not related to the military, including child physical and sexual abuse.[26-28] Because of high stress exposure, research on burnout, cohesion, and trauma in this population is needed.

## Method

The study protocol was approved by the Human Use Committee at Tripler Army Medical Center. Investigators adhered to the policies for protection of human subjects as prescribed in 45 CFR 46.

### Subjects

Participants were 253 medical and support staff from the U.S. Army, Army Reserve Units, U.S. Air Force, and U.S. Navy. Servicemen and women were surveyed upon arrival for participation in a 2-week medical training exercise on Oahu, Hawaii. All participants had left their usual workplace, whether at other locations on Oahu, or on the U.S. mainland, to participate in a stressful training exercise that involved providing a range of medical treatments, including live surgical procedures. All participants were provided written, informed consent to participate in the study, and were recruited by nonmilitary research personnel to avoid any element of coercion. All participants were informed that their decision to participate, not participate, or to withdraw from the study would have no impact (positive or negative) on their status or evaluation in the military.

### Approach to Statistical Analysis

First, summary statistics and bivariate correlates were calculated. Statistical analysis employed the general linear regression models (GLM), multivariate analyses (MANOVA), and analysis of covariance (ANOVA). Model selection was determined by whether an independent variable is categorical or continuous. For dependent variables that were measured on a continuous scale, regression and analysis of variance techniques were used for statistical tests to minimize the loss of power that would result from collapsing these data into ordinal categories. For dependent variables that were measured on a categorical scale, MANOVA was used to control for inter-related subscale variables. The independent variable consisted of three categories: individuals who never met DSM-IV[29]—a criteria for PTSD ("no traumatic exposure"), those who met A1 criteria for PTSD in that they thought their life was in danger during the event ("perceived life threat"), and those who met A1 criteria for PTSD in that they were seriously injured during the event ("traumatic injury"). Given the number of analyses, a $p$ value of 0.01 was used to determine statistical significance.

### Measures

The MBI[19] is one of the most widely validated and reliable tools available for assessing burnout. This 16-item instrument has been used in a wide variety of clinical and nonclinical settings and norms are available for military and civilian populations. The inventory examines three components of burnout: emotional exhaustion, depersonalization, and personal accomplishment. Sample items might include: "I feel used up at the end of a workday" (emotional exhaustion), "I doubt the significance of my work" (depersonalization), and "I feel exhilarated when I accomplish something at work" (negatively scored, personal accomplishment). The correlation between the depersonalization and exhaustion subscales was 0.44, between the depersonalization and personal accomplishment subscales was −0.03, and between the exhaustion and personal accomplishment subscales was 0.08, consistent with previous work and theory.[19]

The Brief Trauma Questionnaire (PP Schnurr, MJ Vielhauer, M Findler M, unpublished instrument, 1998) was included to assess the types of traumatic stressors to which an individual has been exposed. To determine exposure to trauma, individuals are asked whether they experienced each of 10 events. For each affirmative response, individuals are then asked two questions to determine whether the event is likely to meet criterion of the PTSD diagnostic criteria in DSM-IV[29]: (1) whether or not they thought their life was in danger" or that they would be seriously injured or (2) whether they were seriously injured. This information was used to define three trauma exposure groups: no trauma exposure, perceived life threat, and traumatic injury.

The Walter Reed Army Institute of Research Vertical and Horizontal Cohesion Scale,[30] specifically designed for military populations, consists of three subscales. The perception of officers and perceptions of NCOs subscales (six items each) measure subjective perception of the leaders' affective, social, and task support. Sample items include "The officers in my unit let soldiers know when they have done a good job," and "The NCOs in my unit are interested in my personal welfare." The four-item perception of peers subscale assesses affective, behavioral, and cognitive components of cohesion. Sample items include "There are soldiers in my unit that I choose to spend time with during nonduty hours" and "There are service members in my unit that I would consider my friends." Likert scale responses range from 1 (false) to 5 (true). Confirmatory factor analyses indicated that the subscales are distinct, but correlated.[30] The subscales show good construct validity and the instrument has been used extensively with military personnel.[13,30] For the present study, the correlation between the officer and NCO subscales was 0.54, between the officer and peer subscales was 0.35, and between the NCO and peer subscales was 0.47, as would be expected. Demographic items (Table I) were drawn from a demographic questionnaire used extensively with military personnel.[30]

TABLE I

DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

| Variable | Enlisted ($n$ = 171) | | Officers ($n$ = 82) | | Total ($N$ = 253) | |
|---|---|---|---|---|---|---|
| | $n$ | % | $n$ | % | $N$ | % |
| Age (years) | | | | | | |
| 18–25 | 71 | 41.5 | 8 | 9.8 | 79 | 31.2 |
| 26–30 | 33 | 19.3 | 12 | 14.6 | 46 | 18.2 |
| 31–35 | 26 | 15.2 | 19 | 23.2 | 46 | 18.2 |
| 36–40 | 16 | 9.4 | 10 | 12.2 | 26 | 10.3 |
| 41–45 | 10 | 5.8 | 13 | 15.9 | 22 | 8.7 |
| 46+ | 15 | 8.8 | 20 | 24.4 | 34 | 13.4 |
| Gender | | | | | | |
| Male | 104 | 60.8 | 39 | 47.6 | 143 | 56.5 |
| Female | 67 | 39.2 | 43 | 52.4 | 110 | 43.5 |
| Ethnicity | | | | | | |
| Alaskan/Native American | 5 | 2.9 | | | 5 | 2.0 |
| Asian/Pacific Islander | 16 | 9.4 | 5 | 6.1 | 21 | 8.3 |
| African American | 39 | 22.8 | 6 | 7.3 | 45 | 17.8 |
| Hispanic | 16 | 9.4 | 3 | 3.7 | 19 | 7.5 |
| Caucasian | 88 | 51.5 | 68 | 82.9 | 156 | 61.7 |
| Other | 7 | 4.1 | | | 7 | 2.8 |
| Marital status | | | | | | |
| Single | 57 | 33.3 | 21 | 25.6 | 78 | 30.8 |
| Married/cohabitating | 96 | 56.1 | 53 | 64.6 | 149 | 58.9 |
| Divorced/separated | 18 | 10.5 | 8 | 9.7 | 26 | 10.2 |
| Education | | | | | | |
| Some education | 4 | 2.3 | | | 4 | 1.6 |
| High school degree | 79 | 46.2 | | | 79 | 31.2 |
| Technical/vocational degree | 25 | 14.6 | 1 | 1.2 | 26 | 10.3 |
| 2-year degree | 41 | 24.0 | 3 | 3.7 | 44 | 17.4 |
| Bachelor's degree | 17 | 9.9 | 36 | 43.9 | 53 | 20.9 |
| Graduate degree | 5 | 2.9 | 42 | 51.2 | 47 | 18.6 |
| Branch | | | | | | |
| Army | 61 | 35.6 | 40 | 48.8 | 101 | 39.9 |
| Navy | 21 | 12.3 | 17 | 20.7 | 38 | 15.0 |
| Army Reservists | 65 | 38.0 | 19 | 23.2 | 84 | 33.2 |
| Airforce | 24 | 14.0 | 6 | 7.3 | 30 | 11.9 |

## Results

The sample consisted of a wide range of ages and ethnicities and was split fairly equally among men/women, married/not married, and those with/without a college degree (see Table I). Most participants were Army hospital staff (39.9%), whereas a smaller number were Army Reservists (33.2%), Navy hospital staff (15%), or Air Force (11.9%). Additionally, most participants (89.9%) were currently working in their primary military occupational specialty.

Forty-one percent ($n$ = 105) of participants reported no trauma exposure, 38% ($n$ = 98) reported perceived life threat (and no traumatic injury), and 21% ($n$ = 54) reported traumatic injury. Ninety-three percent of individuals ($n$ = 50) who endorsed traumatic injury also reported perceived life threat. Therefore, the data from the four people who reported serious injury without life threat were not used. Table II lists the percentage of participants who endorsed a history of various types of potentially traumatic events. The most commonly endorsed events were: serious accidents (24.9%), major natural or technical disasters (21.3%), "other" situations which caused serious injury or fear of serious injury (24.9%), combat/war related (17.4%), and physical assault (15.4%).

Mean scores and SDs for MBI and cohesion subscales are presented in Table III. Compared to normative scores on the MBI of 21 for emotional exhaustion, 9 for depersonalization, and 35 for personal accomplishment,[19] the sample scored in the low medium range for emotional exhaustion, higher than average for depersonalization, and in the medium range for personal accomplishment. Table IV lists correlations of demographic variables length of time in military, age, gender, and ethnicity with outcome variables. Demographic variables did not correlate with the dependent variables (cohesion subscales) and so were not included as covariates.

Because the perception of the NCO subscale was designed for enlisted personnel, only enlisted participants were used for that analysis. Analysis of variance showed that trauma did not predict perception of NCOs for enlisted individuals. A multivariate analysis of variance (MANOVA) model examining perception of peers and officers, with trauma exposure as a between-subjects factor, was significant (Wilk's $\lambda$ = 0.96, $F(4,498)$ = 2.39, $p <$ 0.01). No between-group differences were found for perception of peers. However, trauma predicted significantly lower perception of officers ($F(2,250)$ = 4.22, $p < 0.01$). Post hoc tests indicated that service members who reported traumatic injury had significantly poorer perception of officers than both those with

TABLE II

PERCENTAGE (AND NUMBER) OF PARTICIPANTS WHO ENDORSED VARIOUS TYPES OF EVENTS PRIOR TO DEPLOYMENT AS MEASURED BY THE BRIEF TRAUMA QUESTIONNAIRE

| Variable | Enlisted ($n$ = 171) | Officers ($n$ = 82) | Total ($N$ = 253) |
|---|---|---|---|
| 1. Have you ever served in a war zone, or have you ever served in a non-combat job that exposed you to war-related casualties? | 17.0 (29) | 18.3 (15) | 17.4 (44) |
| 2. Have you ever been in a serious car accident, or a serious accident at work or somewhere else? | 28.1 (48) | 18.3 (15) | 24.9 (63) |
| 3. Have you ever been in a major natural or technological disaster, such as a fire, tornado, hurricane, flood, earthquake, or chemical spill? | 24.0 (41) | 15.9 (13) | 21.3 (54) |
| 4. Have you ever had a life-threatening illness such as cancer, a heart attack, leukemia, AIDS, multiple sclerosis, etc? | 3.5 (6) | 3.7 (3) | 3.6 (9) |
| 5. Before age 18, were you physically punished or beaten by a parent, caretaker, or teacher so that: you were very frightened; or you thought you would be injured; or you received bruises, cuts, welts, lumps or other injuries? | 22.2 (38) | 19.5 (16) | 21.3 (54) |
| 6. Not including any punishments or beatings you have already reported in question 5, have you ever been attacked, beaten, or mugged by anyone, including friends, family members, or strangers? | 17.0 (29) | 12.2 (10) | 15.4 (39) |
| 7. Has anyone ever made or pressured you into having some type of unwanted sexual contact? | 6.4 (11) | 7.3 (6) | 6.7 (17) |
| 8. Have you ever been in any other situation in which you were seriously injured, or have you ever been in any other situation in which you feared that you might be seriously injured or killed? | 24.6 (42) | 25.6 (21) | 24.9 (63) |
| 9. Has a close family member or friend died violently, for example in a serious car crash, mugging, or attack? | 4.1 (7) | 3.7 (3) | 4.0 (10) |
| 10. Have you ever witnessed a situation in which someone was seriously injured or killed, or have you ever witnessed a situation in which you feared someone would be seriously injured or killed? | 7.6 (13) | 4.9 (4) | 6.7 (17) |

perceived life threat and those with no trauma exposure. Because we expected there may be differences in cohesion between enlisted and officers, we also ran these analyses including rank as a covariate. However, rank was not a significant variable in any of the analyses.

Next, we examined whether trauma exposure would predict lower burnout subscale scores. A MANOVA model examining depersonalization, emotional exhaustion, and personal accomplishment subscales, with trauma exposure as a between-subjects factor, was significant (Wilk's $\lambda = 0.93$, $F(6,498) = 3.06$, $p < 0.01$). No between-group differences were found for the personal accomplishment subscale. However, history of trauma predicted significantly higher scores on depersonalization ($F(2,250) = 4.19$, $p < 0.01$) and emotional exhaustion ($F(2,250) = 5.34$, $p < 0.01$). Post hoc tests indicated that service members who reported traumatic injury had significantly higher depersonalization scores than those with perceived life threat and significantly higher emotional exhaustion scores than both those with perceived life threat and those with no trauma exposure.

We also examined whether those with lower scores on the MBI subscales would also have lower cohesion subscale scores. Results of regression analyses (summarized in Table V) indicated that poorer perception of officers was predicted by higher depersonalization and lower personal accomplishment scores. Poorer perception of NCOs was predicted by lower personal accomplishment and higher emotional exhaustion scores, and poorer perception of peers was predicted by lower personal accomplishment scores.

## Discussion

In this sample of tri-service medical and support staff entering a training deployment, history of trauma was related to how individuals view their officers. Scholars have discussed the role that traumatic experiences can have on the ability of an individual to develop healthy attachments.[12] Because secure attachment ability is a necessary foundation for healthy interpersonal relationships, a traumatic injury perceived to be caused by another person may lead individuals to become distrustful of others. When other people are involved in the traumatic event, relationships may serve as a trigger for the fear that a trauma can recur. Furthermore, a traumatic event that takes place within an organization might lead an individual to feel betrayed by the leaders that they expected to protect them. As a result,

TABLE III

MEANS (M) AND SD FOR MBI AND COHESION SUBSCALES

| | Enlisted ($n$ = 171) | | Officers ($n$ = 82) | | Total ($N$ = 253) | |
|---|---|---|---|---|---|---|
| Variable | M | SD | M | SD | M | SD |
| MBI exhaustion | 17.87 | 8.05 | 16.6 | 7.36 | 17.5 | 7.8 |
| MBI depersonalization | 19.46 | 5.74 | 18.3 | 6.11 | 19.1 | 5.9 |
| MBI accomplishment | 34.75 | 6.5 | 36.18 | 5.66 | 35.2 | 6.3 |
| Perception of officer | 3.29 | 1.07 | 3.51 | 1.03 | 3.36 | 1.06 |
| Perception of NCOs | 3.69 | .99 | 3.50 | .92 | 3.6 | .97 |
| Perception of peers | 3.74 | 1.05 | 3.74 | 1.11 | 3.7 | 1.1 |

TABLE IV

SPEARMAN'S $\rho$ CORRELATIONS AMONG DEMOGRAPHIC VARIABLES, PREVIOUS TRAUMA, COHESION, AND MBI

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Gender | 1.00 | | | | | | | | | | | |
| 2. Race | −0.12* | 1.00 | | | | | | | | | | |
| 3. Time in military | 0.16* | −0.05 | 1.00 | | | | | | | | | |
| 4. Age (years) | 0.17* | 0.04 | 0.81** | 1.00 | | | | | | | | |
| 5. Perceived life threat | 0.00 | 0.02 | 0.14 | 0.14 | 1.00 | | | | | | | |
| 6. Traumatic injury | 0.01 | 0.02 | −0.05 | 0.00 | 0.41** | 1.00 | | | | | | |
| 7. Maslach exhaustion | −0.05 | 0.12 | −23** | −0.15 | −0.16* | 0.32* | 1.00 | | | | | |
| 8. Maslach depersonalization | 0.13 | 0.08 | −0.10 | −0.16* | 0.06 | 0.03 | 0.44** | 1.00 | | | | |
| 9. Maslach accomplishment | 0.02 | 0.13 | 0.09 | 0.15 | 0.07 | −0.11 | 0.08 | 0.03 | 1.00 | | | |
| 10. Perception of peers | −0.03 | 0.10 | −0.04 | −0.02 | 0.12 | −0.03 | −0.00 | −0.07 | 0.22** | 1.00 | | |
| 11. Perception of NCOs | 0.10 | 0.12 | −0.03 | 0.04 | −0.04 | −0.04 | −0.17* | −0.16* | 0.23** | 0.47** | 1.00 | |
| 12. Perception of officers | 0.03 | 0.01 | 0.08 | 0.07 | −04 | −0.11 | −0.11 | −16* | 0.28** | 0.35** | 0.54** | 1.00 |

* $p < 0.01$; ** $p < 0.001$.

survivors may act out their distrust with the leaders that represent the organization, in this case, officers.

Little research has examined the role of trauma exposure upon peer attachment. One study of incarcerated youth[31] showed that trauma exposure was significantly related to a less secure parental attachment, but not to peer attachment. Additionally, when controlling for exposure level, less secure parental attachment (but not peer attachment) was associated with PTSD symptoms. Although the present data are compatible with the hypothesis that exposure to trauma may impact the capacity to attach, only a longitudinal study would verify the direction(s) of this relationship.

Unexpectedly, traumatic exposure involving only fear or the belief that their lives were in danger was not related to cohesion. Previous research has suggested that childhood maltreatment might impact cohesive relationships.[13] It is noted, however, that in the present study, participants in the traumatic injury category consisted of those who reported both life threat and serious injury. Predictors of PTSD following serious injury typically involve interacting variables, including perceived life threat,[31] as well as premorbid diagnoses and childhood adversity.[32] It is possible that injury may interact with other variables to result in nonclinical consequences such as difficulties with burnout and cohesion.

TABLE V

RESULTS OF REGRESSION ANALYSES REGRESSING COHESION SUBSCALES UPON LEVEL II TRAUMA HISTORY

| Variable | B | SE B | $\beta$ | Significance |
|---|---|---|---|---|
| Perception of Officers | | | | |
| $R = 0.43$, $R^2 = 0.18$, $F(3,249) = 18.35$* | | | | |
| MBI depersonalization | −4.15 | 0.01 | −0.23 | 0.00* |
| MBI personal accomplishment | 4.86 | 0.01 | 0.29 | 0.00* |
| MBI exhaustion | 1.68 | 0.01 | −0.12 | 0.06 |
| Perception of NCOs (enlisted only) | | | | |
| $R = 0.35$, $R^2 = 0.12$, $F(3, 170) = 7.81$* | | | | |
| MBI depersonalization | −1.67 | 0.01 | −0.10 | 0.23 |
| MBI personal accomplishment | 4.48 | 0.01 | 0.29 | 0.00* |
| MBI exhaustion | −1.95 | 0.01 | −0.16 | 0.05* |
| Perception of peers | | | | |
| $R = 0.26$, $R^2 = 0.07$, $F(3, 249) = 6.24$* | | | | |
| MBI personal accomplishment | 4.19 | 0.01 | 0.25 | 0.00* |
| MBI exhaustion | 7.12 | 0.01 | −0.05 | 0.46 |

* $p < 0.05$.

Interestingly, traumatic injury also was associated with higher depersonalization and emotional exhaustion scores. Serious injury is a consistent predictor of both short-term and chronic PTSD following traumatic events.[32-34] A traumatic injury may alter the coping mechanisms that were in place before the trauma, making individuals more vulnerable to feeling higher exhaustion and lower enthusiasm. For instance, trauma and injury often result in increased irritability, anger, and depression,[12] maladies that overlap with the burnout construct and that may impact relationships. Research has shown that, among military medical personnel, stressful life events before and during deployment are related to depression, anxiety, and PTSD symptoms.[35] Furthermore, exhaustion and low enthusiasm can take a toll on the ability of health care providers to perform their duties.

Burnout may also have its own impact on group cohesion. In the present study, individuals who scored lower on the personal accomplishment subscale reported poorer cohesion across relationships with officers, NCOs, and peers. Those who score low on the personal accomplishment subscale feel that they are not making an effective contribution to their organization. Low accomplishment may alienate such individuals from the peers and superiors with whom they work, and ultimately lead to poor working relationships. Among enlisted men and women, those who scored higher on the emotional exhaustion subscale saw their NCOs as less effective and/or supportive than those who did not feel depleted. However, emotional exhaustion was not associated with perceptions of peers or officers. NCOs serve as immediate supervisors, serving on the "front line" with the enlisted service members. Because NCOs are the ones who deliver orders and make sure they are carried out, NCOs may be perceived by enlisted service members as accountable for their work load, and thus their exhaustion.

Whereas having a more cynical outlook, as evidenced by higher MBI depersonalization scores, did not predict negative perception of NCOs or peers, it did predict the perception of unit officers as less effective and supportive. Individuals who score high in depersonalization believe that their job role is insignificant and that their work does not contribute to a meaningful goal.[20] When individuals doubt the significance of their work tasks, they may lose interest in their work and perhaps in the leaders who represent the organizations. Peers and NCOs, however, may not be seen as having a role in the overall goals (and accompanied insignificance) of the organizational tasks.

It is noted that the present study is limited by its retrospective nature and so causal relationships cannot be determined. Our findings suggest that the difficulties resulting from burnout symptoms and serious injury may lead to poorer cohesion. Other research has shown that depersonalization and emotional exhaustion correlate with a history of frequent exposure to trauma and to exposure to highly disturbing incidents.[22] Our findings that higher burnout levels correlate with poorer cohesion are consistent with previous investigations.[23] Longitudinal data with multiple measurements over time is needed to evaluate the potential interactive nature of these variables.

## Conclusions

Military behavioral health specialists have frequently been frustrated by an inability to make an impact on patient's lives, because, at the time of an initial visit, the disorder has usually developed a chronic pattern. The focus quickly becomes clinical diagnosis and the outcome an early discharge from military service. Our work shows that simple means of assessment can identify military members who are at risk for alienation and poor performance. Interventions have been developed for burnout[36] and for interpersonal competence[37] that would likely prove useful for preventing escalation of problems in at-risk personnel.

In closing, the present study suggests that the implications of a traumatic injury may go beyond a clinical diagnosis of PTSD. A traumatic injury may impact functioning in healthy individuals who do not have a clinical diagnosis such as PTSD. These results also support the important role for military behavioral health specialists in prevention, rather than waiting until the development of a full-blown disorder. Our work supports the use of primary prevention techniques to identify medical personnel at risk for poor performance and negative outcomes. We hope that use of such assessment tools will allow early identification of those at risk and will pave the way to early intervention.

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## References

1. Siebold GL: The evolution of the measurement of cohesion. Mil Psychol 1999; 11: 5–26.
2. Bartone PT, Adler AB: Cohesion over time in a peacekeeping medical task force. Mil Psychol 1999; 11: 85–107.
3. Griffith J: Test of a model incorporating stress, strain, and disintegration in the cohesion-performance relation. J Appl Soc Psychol 1997; 27: 1489–526.
4. Langfred CW: Is group cohesiveness a double-edged sword? Small Group Res 1998; 29: 124–43.
5. Paskevich DM, Brawley LR, Dorsch KD, Widmeyer WM: Relationship between collective efficacy and team cohesion: conceptual and measurement issues. Group Dyn 1999; 3: 210–22.
6. Oliver LW, Harman J, Hoover E, Hayes SM, Pandhi NA: A quantitative integration of the military cohesion literature. Mil Psychol 1999; 11: 57–83.
7. Litz BT, Schlenger WE, Weathers FW, Caddell JM, Fairbank JA, LaVange LM: Predictors of emotional numbing in posttraumatic stress disorder. J Trauma Stress 1997; 10: 607–18.
8. Novaco RW, Chemtob CM: Anger and combat-related posttraumatic stress disorder. J Trauma Stress 2002; 15: 123–32.
9. Catlin G, Epstein S: Unforgettable experiences: the relation of life events to basic beliefs about self and world. Soc Cogn 1992; 10: 189–209.
10. Classen C, Field NP, Koopman C, Nevill-Manning K, Spiegel D: Interpersonal problems and their relationship to sexual revictimization among women sexually abused in childhood. J Interpers Violence 2001; 16: 495–509.
11. DiLillo DK, Long PJ: Perceptions of couple functioning among survivors of child sexual abuse. J Child Sex Abus 1999; 7: 59–76.
12. McFarlane AC, Bookless C: The effect of PTSD on interpersonal relationships: issues for emergency service workers. Sex Relatsh Ther 2001; 16: 45–51.
13. Rosen LN, Martin L: Childhood antecedents of psychological adaptation to military life. Milit Med 1996; 161: 665–8.
14. Martin L, Rosen LN, Durand DB, Knudson KH, Stretch RH: Psychological and physical health effects of sexual assaults and nonsexual traumas among male and female United States Army Soldiers. Behav Med 2000; 26: 23–34.
15. Bowlby J: Attachment and Loss, Vol 3: Loss, Sadness, and Depression. New York, Basic Books, 1980.
16. Zakin G, Solomon Z, Neria Y: Hardiness, attachment style, and long term psychological distress among Israel POWs and combat veterans. Pers Individ Dif 2003; 34: 819–29.
17. Kanninen K, Salo J, Punamaki R: Attachment patterns and working alliance in trauma therapy for victims of political violence. Psychother Res 2000; 10: 435–49.
18. Andreopoulos SH: Childhood trauma and childhood sexual abuse as predictor of variables of adult attachment and adult partner violence in a population of substance abusing men, pp 62, 11-B. In: Dissertation Abstracts International: Section B: The Sciences and Engineering 2000. UMI No. 5360, US: ProQuest Information and Learning, 2000.
19. Maslach C, Jackson S, Leiter MP: Maslach Burnout Inventory, Ed 3. Palo Alto, CA, Consulting Psychologists Press, Inc, 1997.
20. Maslach C: Burnout: A Multidimensional Perspective. Philadelphia, PA, Taylor & Francis, 1993.
21. Jackson SE, Maslach C: After effects of job-related stress. J Occup Behav 1982; 3: 63–77.
22. Alexander DA, Klein S: Ambulance personnel and critical incidents: impact of accident and emergency work on mental health and emotional well-being. Br J Psychiatry 2001; 178: 76–81.
23. Leiter MP, Clark D, Durup J: Distinct models of burnout and commitment among men and women in the military. J Appl Behav Sci 1994; 30: 63–82.
24. Maslach C, Jackson SE, Leiter MP: Maslach Burnout Inventory. In: Evaluation Stress: A Book of Resources, Ed 3, pp 191–218. Edited by Zalaquett CP, Wood RJ. Lanham, MD, The Scarecrow Press, Inc., 1997.
25. Whealin JM, Morgan CA, Hazlett G: The role of military studies in enhancing our understanding of PTSD. National Center for PTSD Research Quarterly, Winter 2001, White River Junction, VT.
26. Hourani LL, Yuan H: The mental health status of women in the Navy and Marine Corps: preliminary findings from the perceptions of wellness and readiness assessment. Milit Med 1999; 164: 174–81.
27. Merrill LL, Newell CE, Milner JS, et al: Prevalence of premilitary adult sexual victimization and aggression in a navy recruit sample. Milit Med 1998; 163: 209–12.
28. Stretch RH, Knudson KH, Durand D: Effects of premilitary and military trauma on the development of post-traumatic stress disorder symptoms in female and male active duty soldiers. Milit Med 1998; 163: 466–70.

29. Diagnostic and Statistical Manual of Mental Disorders, Ed 4. Washington, DC, American Psychiatric Association, 1994.
30. Bliese PD, Halverson RR: Individual and nomothetic models of job stress: an examination of work hours, cohesion, and well-being. J Appl Soc Psychol 1996; 26: 1171–89.
31. Linberg NM: Attachment cognitions as moderators of posttraumatic stress disorder symptomatology in adolescents exposed to community violence, p 86 (dissertation). Los Angeles, CA, University of California, 1997.
32. Blanchard EB, Hickling EJ, Mitnick N, Taylor AE: The impact of severity of physical injury and perception of life threat in the development of post-traumatic stress disorder in motor vehicle accident victims. Behav Res Ther 1995; 33: 529–34.
33. Gerring JP, Slomine B, Vasa RA, et al: Clinical predictors of posttraumatic stress disorder after closed head injury in children. J Am Acad Child Adolesc Psychiatry 2002; 41: 157–65.
34. Zatick DF, Kang S, Mueller H, et al: Predicting posttraumatic distress in hospitalized trauma survivors with acute injuries. Am J Psychiatry 2002; 159: 941–6.
35. Slusarcick AL, Ursano RJ, Fullerton CS, Dinneen MP: Life events in health care providers before and during Persian gulf war deployment: the USNS comfort. Milit Med 1999; 164: 675–82.
36. Van Dierendonck D, Schaufeli WB, Buunk BP: The evaluation of an individual burnout intervention program: the role of inequity and social support. J Appl Psychol 1998; 83: 392–407.
37. Frey KS, Hirschstein MK, Guzzo BA: Second step: preventing aggression by promoting social competence. J Emotion Behav Disord 2000; 8: 1–14.