

Physical Health Symptoms in Peacekeepers: Has the Role of Deployment Stress Been Overrated?

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Using a prospective design, physical health symptoms were examined in a sample of 198 peacekeepers. At pre-deployment, general life stressors and pre-deployment stress symptoms were significant predictors of physical health symptoms. At post-deployment, physical health symptoms were predicted by pre-existing physical health symptoms and stress symptoms reported before and after the mission; mission-related stressors were not associated with physical health symptoms. In addition, stress symptoms mediated the relationship between exposure and physical symptoms. Finally, the hyperarousal symptom cluster was a better predictor of physical health complaints than the other symptom clusters. Implications and limitations are discussed.

KEYWORDS *peacekeeping, posttraumatic stress disorder, physical symptoms, stress*

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Multiple studies have demonstrated a relationship between posttraumatic stress disorder (PTSD) and physical health symptoms. Health conditions, perceived health status, physical health self-reports, increased medical utilization, and morbidity have all been linked with PTSD (for a review, see Schnurr & Jankowski, 1999). Additionally, longitudinal studies have demonstrated that physical symptoms may be associated with posttraumatic stress symptoms up to 20 years after an individual is exposed to trauma (Boscarino, 1997; Elder, Shanahan, & Clipp, 1997; Neria & Koenan, 2003; Solomon, 1988; Solomon & Mikulincer, 1986). Increased self-reports of physical symptoms associated with PTSD have been consistently noted in populations such as combat veterans (Engel, Liu, McCarthy, Miller, & Ursano, 2000; Litz, Keane, Fisher, Marx, & Monaco, 1992; Schnurr, Spiro, & Paris, 2000), sexual assault victims (Kimerling & Calhoun, 1994; Zoellner, Goodwin, & Foa, 2000), and firefighters (McFarlane, Atchison, Rafalowicz, & Papay, 1994). To date, the association between mission stress and physical symptoms has rarely been examined among peacekeepers, despite the fact that peacekeepers are exposed to an array of significant deployment stressors and demands.

Peacekeepers poised for deployment consistently demonstrate high levels of distress and many report previous exposure to potentially traumatic experiences (PTEs), the majority of which are non-deployment related (Bolton, Litz, Britt, Adler, & Roemer, 2001; Maguen, Litz, Wang, & Cook, 2004). During deployment, there are a variety of stressors (e.g., providing humanitarian assistance in a hostile environment; witnessing violence, mass starvation, and death) that may potentiate the risk for developing PTSD (Bartone & Adler, 1998; Litz, 1996; Maguen et al., 2004). However, most studies do not assess whether stressors are associated with physical health symptoms in peacekeepers. While some studies describe the relationships between deployment-related exposures and physical health (Britt & Adler, 1999; Hotopf et al., 2003a), none have assessed the association between exposure, PTSD, and physical health in a peacekeeping sample.

Studies have shown that exposure to mission stressors contributes to psychological conditions such as PTSD and depression (e.g., Hotopf et al., 2003b), and there is an association between exposure to trauma and physical health symptoms (Boscarino, 1997; Elder et al., 1997; Hourani, Yuan, & Bray, 2003). Additionally, previous research suggests that PTSD may act as a mediator between exposure and physical health symptoms (Engel et al., 2000; McFarlane et al., 1994; Schnurr & Spiro, 1999; Taft, Stern, King, & King, 1999; Wagner, Wolfe, Rotnitsky, Proctor, & Erickson, 2000; Wolfe, Schnurr, Brown, & Furey, 1994). For instance, among a sample of female Vietnam veterans, Wolfe et al. (1994) found that exposure and PTSD independently predicted poorer physical health. However, after controlling for PTSD, the effects of exposure on physical health symptoms decreased, demonstrating a mediated relationship. Subsequent studies have demonstrated

a direct relationship between PTSD and physical health, and an indirect relationship between combat exposure and physical health (Schnurr & Spiro, 1999; Taft et al., 1999). However, to date no study has ruled out the influence of pre-exposure stress or physical health symptoms. Post-exposure physical health complaints could be a manifestation of a pre-existing condition.

In order to better understand the elements of PTSD that are related to physical health, a few studies have examined the relationship between specific and distinct variable sub-clusters embedded in the PTSD construct (e.g., hyperarousal, avoidance, and re-experiencing) and physical health symptoms in various types of trauma, such as sexual assault (Kimerling, Clum, & Wolfe, 2000; Zoellner et al., 2000) and exposure to violence (Woods & Wineman, 2004). Symptoms of arousal are the most likely to be associated with somatic complaints and physical morbidity after exposure to trauma (Friedman & Schnurr, 1995; Schnurr & Jankowski, 1999). Various physical health symptoms may be the result of high tonic sympathetic arousal and higher circulating stress hormones, which have also been found in veterans with PTSD when compared to veterans without PTSD (Beckham et al., 2003; Buckley, Holohan, Greif, Bedard, & Suvak, 2004; Buckley & Kaloupek, 2001). Avoidance and re-experiencing have also been associated with physical health symptoms (Woods & Wineman, 2004; Zoellner et al., 2000), although these studies were conducted with civilians.

This study examined: 1) the relationship between pre-deployment stress variables (i.e., general stressors, traumatic life events, and PTSD symptoms) and pre-deployment physical health symptoms; 2) the predictors of post-deployment physical health symptoms in peacekeepers who were exposed to deployment-related stressors and positive military experiences (i.e., potentially traumatizing events, general overseas military duty stressors, negative aspects of peacekeeping, and positive military experiences); 3) the role of PTSD symptoms as a potential mediator between trauma exposure and self-reported physical health symptoms; and 4) the association between each of the PTSD symptom clusters and physical health symptoms. It was hypothesized that: pre- and post-deployment stressors would predict physical health symptoms; PTSD symptoms would mediate the relationship between exposure and physical health outcomes; and hyperarousal would demonstrate the strongest association with physical health symptoms.

METHOD

Participants

From November 1995 through October 1997, active-duty (AD) and reserve military (RM) personnel completed a pre-deployment survey approximately four to six weeks prior to their deployment to Bosnia-Herzegovina, in

collaboration with the U.S. Army Medical Research Unit–Europe (USAMRU-E) and the Walter Reed Army Institute for Research. All personnel were informed that participation was completely voluntary. All soldiers who agreed to participate ($n = 3,325$) received a survey with a cover page containing the elements of informed consent and specifying that by filling out the survey, they provided their consent for participation. Most were AD soldiers stationed in Germany before deployment to the Balkans ($N = 3,034$). A smaller sample of RMs personnel in North Carolina, who were part of a security contingent, was also sampled ($N = 291$). RMs personnel were included in the study because they typically comprise a component of the fully deployed force. In both cases, a convenience sample was employed in that all soldiers who were present for duty were asked to participate. The sample represented approximately 18% of the population of U.S. troops in the initial wave of NATO's implementation force of 1995 (IFOR; $N \approx 18,000$).

For the AD group, a stratified random sample of soldiers ($n = 261$) was obtained from the 1,492 who consented to follow-up. Stratification was based upon pre-deployment levels of exposure to PTEs. Three PTE subgroups were generated based on the dispersion of scores in the larger sample of 1,492. The PTE cutting scores were based on percentage tertiles (low, moderate, and high). Out of the 261 AD personnel that were followed up, only $n = 133$ received physical health symptom questionnaires at baseline and were included in this study. For the RM group, 65 of the 105 individuals (62%) that agreed to follow-up and provided information were included in this study. Therefore, the resultant sample consisted of $n = 198$ participants (133 AD personnel and 65 RM). Of the entire sample, 23% were deployed to the Bosnia-Herzegovina region for 1–6 months, 76% were deployed for 6–12 months, and 1% was deployed for greater than 12 months.

Procedure

AD soldiers located in Germany independently completed the survey in large auditoriums or smaller classrooms under standardized conditions with a research coordinator present to provide instructions and answer questions. The RM sample trained in North Carolina completed the survey individually prior to beginning their deployment duties. A survey company, unrelated to the military, was trained by our research team to conduct the post-deployment interviews for both the AD and RM groups via telephone 12 to 18 months after redeployment.

Pre-Deployment Measures

The pre-deployment survey consisted of a demographic questionnaire, general questions about the participant's military service, a stress-related measure, a prior lifetime trauma measure, a physical health symptom

questionnaire, and the USAMRU-E PTSD Scale (Bartone, Adler, & Vaitkus, 1994; Castro & Adler, 1999).

CURRENT STRESSORS

This 27-item scale was compiled by investigators from a list of stressors obtained from previous studies. Participants were required to rate current troubles and concerns (e.g., financial problems, separation from family, unsupportive family, and problems with unit leaders) using a five-point Likert scale ranging from 1 (*very low*) to 5 (*very high*). In the current sample, the internal consistency of this instrument was $\alpha = .88$.

BRIEF LIFESPAN TRAUMA

This 8-item measure was culled by the investigators to assess the incidence of trauma experienced during deployment and/or during civilian life (e.g., natural disaster, sexual assault, physical assault, and witnessing death). The instrument used a 4-point Scale (1 = *Yes, on deployment*, 2 = *Yes, not on deployment*, 3 = *No, never*, and 4 = *Both on deployment & not on deployment*). Items were recoded to indicate whether or not a person had been exposed to each of the potentially traumatic events.

HEALTH SYMPTOM CHECKLIST

Fifteen of the original 25 items from the Health Symptom Checklist (HSC; Bartone, Ursano, Wright, & Ingraham, 1989), were used to measure how often soldiers experienced health troubles or complaints in the "last few weeks" (e.g., headaches, shortness of breath, allergies). Response options ranged from 1 (*none*) to 4 (*very often*). In the current sample, the internal consistency of this measure was $\alpha = .85$.

POSTTRAUMATIC STRESS DISORDER

The USAMRU-E PTSD measure evaluates the frequency of the 17 PTSD symptoms as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) using a Likert scale from 1 (*not at all*) to 5 (*very often*). This instrument has been found to have excellent internal consistency ($\alpha = .92$; Adler, Huffman, & Castro, 1999). For the current sample, the internal consistency of this scale was $\alpha = .96$.

Post-Deployment Measures

The post-deployment survey consisted of a number of self-report measures to assess PTSD symptoms, physical health symptoms, and appraisals of a

variety of potentially stressful and potentially rewarding aspects of the peacekeeping mission.

POSTTRAUMATIC STRESS DISORDER

A modified version of the PTSD Checklist (PCL; Weathers et al., 1993) was used to assess PTSD symptoms at post-deployment. The PCL uses a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*), to evaluate the severity of each of the 17 PTSD symptoms in the DSM-IV (American Psychiatric Association, 1994). Where appropriate, items made specific reference to the Bosnia peacekeeping experience (e.g., In the past month, to what extent have you been bothered by repeated, disturbing memories of your deployment experiences?). This scale has demonstrated excellent internal consistency ($\alpha = .97$) as well as adequate sensitivity and specificity ($\alpha = .82$, and $\alpha = .83$, respectively; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Ventureyra, Yao, Cottraux, Note, De Mey-Guillard, 2002; Weathers, Litz, Herman, Huska, & Keane, 1993). In the current sample, the internal consistency of this scale was $\alpha = .93$.

HEALTH SYMPTOM CHECKLIST

This measure was re-administered at post-deployment. The internal consistency for this measure at post-deployment was $\alpha = .85$.

STRESSORS AND ATTITUDES

Appraisals of the potentially negative and positive aspects of participation in the mission were assessed using a number of scales that were derived based upon our previous work evaluating peacekeeping-related stress (e.g., Litz et al., 1997). Items were constructed to fit into the following four appraisal and exposure categories:

1. *General Overseas Military Stressors (GOMS)*—This 8-item measure was used to evaluate generic, low-magnitude stressors that soldiers are typically exposed to in overseas military deployment (e.g., “being separated from family and friends” and “having little privacy and personal space”). For each item, participants were asked to rate the degree to which the experience had a negative impact on them. Response options ranged from 1 (*No negative impact*) to 4 (*Extremely negative impact*). The internal consistency of this scale for this sample was $\alpha = .67$.
2. *Negative Aspects of Peacekeeping Scale (NAPS)*—This scale measured the extent to which participants found peacekeeping duties and issues related to the mission in Bosnia difficult or frustrating on a 4-point Likert scale

- ranging from 1 (*No negative impact*) to 4 (*Extremely negative impact*; e.g., “seeing children who were victims of war” and “seeing civilians in despair”). In this sample, the internal consistency of this scale was $\alpha = .91$.
3. *Positive Military Experiences Scale (PMES)*—This 11-item inventory, used in a previous study of peacekeeping in Somalia (Litz et al., 1997), assessed the general positive aspects of military service (e.g., pride in serving your country). For each item, participants were asked to rate the degree to which the experience had a positive impact on them personally. Response options ranged from 1 (*No positive impact*) to 4 (*Extremely positive impact*). In the current sample, the internal consistency for this measure was $\alpha = .88$.
 4. *Potentially Traumatizing Events Scale (PTE)*—This 8-item inventory was partially derived from the Combat Exposure Scale, which measured the frequency of exposure to war-zone-related stressors (Keane et al., 1989). Our research team derived additional items related to the Bosnia mission that fit the characterization of a Criterion A event for PTSD as outlined in the DSM-IV (American Psychiatric Association, 1994). The inventory required participants to rate how negative their emotional reactions were concerning various experiences, which were likely to produce fear, helplessness, or horror while they were in Bosnia on a 4-point Likert scale ranging from 1 (*No negative impact*) to 4 (*Extremely negative impact*; e.g., “patrolling areas or riding in areas where there were land mines” and “witnessing violence”). In the current sample, the internal consistency of this scale was $\alpha = .81$.

RESULTS

Follow-up Between-Group Comparisons

Soldiers ($n = 198$) who completed the post-deployment survey were compared to those who did not ($n = 2,794$) on various demographic and military characteristics (these data are in Table 1). Soldiers who completed the post-deployment survey tended to be slightly older, more educated, and somewhat higher in rank. There were also proportionately more females and Caucasians in the post-deployment sample. However, there were no statistically significant group differences with respect to soldiers' number of previous deployments and marital status.

Preliminary Within-Sample Comparisons

Given that the sample was comprised of both an AD and RM soldiers, these groups were first compared to ensure that there were no pre-deployment differences that would influence the outcome variables. An independent t-test revealed that there were no significant differences on physical health

TABLE 1 Comparisons of Soldiers Who Were Followed Up ($n = 198$) to Soldiers Who Were Not Followed Up ($n = 2,794$): Demographic and Military Characteristics

Demographic/Military Characteristics	Completed follow-up survey ($n = 198$)	Did not complete follow-up survey ($n = 2,794$)	Between-groups statistics (t or χ^2)
Age (years)	Mean = 26.99 ($SD = 6.79$)	Mean = 25.51 ($SD = 5.79$)	$t = 3.18^{**}$
Gender			
Male	81%	92%	$\chi^2 = 27.70^{**}$
Female	19%	9%	
Ethnicity			
Caucasian	67%	57%	$\chi^2 = 8.23^{**}$
Non-caucasian	33%	43%	
Marital status			
Married	61%	58%	$\chi^2 = .70$
Non-married	39%	42%	
Highest level of education			
High school diploma or less	34%	46%	$t = 4.50^{**}$
Some college/technical school	45%	41%	
College degree or higher	21%	12%	
Rank			
Junior enlisted (E1 to E4)	48%	57%	$t = 3.00^{**}$
Non-commissioned officers (E5 to E9)	40%	36%	
Officers (O1 and higher; warrant officers)	12%	7%	
Number of prior deployments	$X = .91$ ($SD = 1.50$)	$X = .85$ ($SD = 1.45$)	$t = .62$

* $p < .05$; ** $p < .01$.

symptoms either at pre-deployment ($t = .33$, $p = .74$) or post-deployment ($t = .45$, $p = .65$).

Pre-Deployment Predictors of Physical Health Symptoms

Prior to utilizing a regression analysis to predict physical health symptoms at pre-deployment, Pearson's correlations were computed between physical health symptoms at pre-deployment and a number of demographic and military variables (e.g., age, education, rank, gender, ethnicity, previous deployments, and marital status). These results indicated that only gender ($r = .17$, $p < .05$) was significantly correlated with pre-deployment physical health symptoms, and as a result, it was included in the regression analysis.

In the hierarchical regression model predicting physical health symptoms at pre-deployment (as indicated in Table 2), gender was entered in Step 1 to partial out the variance attributable to this variable. In Step 2, all of the stress-related variables were subsequently entered: potentially traumatic events, reported stressors prior to deployment, and PTSD symptoms at pre-deployment.

TABLE 2 Hierarchical Regression of Pre-Deployment Stressors Predicting Physical Health Symptoms ($n = 182$)

Variable	β	T	Adjusted R^2
Step 1:			
Gender	.01	.13	.02*
Step 2:			
Brief lifespan trauma	.05	.84	.37**
General life stressors	.14*	2.4	
Pre-deployment PTSD	.57**	9.1	

Note. Model statistics for the physical health symptoms equation is: $F(4, 182) = 28.07, p < .01$.

* $p < .05$; ** $p < .01$.

The model specified accounted for 37% of the variance in pre-deployment physical health symptoms. After controlling for gender, current stressors ($\beta = .14$) and PTSD symptoms at pre-deployment ($\beta = .57$) emerged as significant predictors of pre-deployment physical health symptoms.

Post-Deployment Predictors of Physical Health Symptoms

Pearson's correlations were then determined between physical health symptoms at post-deployment and a number of demographic and military variables (i.e., age, education, rank, gender, ethnicity, previous deployments, and marital status). None of these variables were significantly correlated with post-deployment physical health symptoms, and as a result, they were not included in the subsequent analysis.

In the hierarchical regression model predicting physical health symptoms at post-deployment (as indicated in Table 3), pre-deployment physical health symptoms and PTSD symptoms were entered in Step 1, given that this was a prospective study. In Step 2, the five appraisal, exposure, and stress

TABLE 3 Hierarchical Regression of Deployment-Related Experiences and Appraisals Predicting Physical Health Symptoms ($n = 96$)

Variable	β	T	Adjusted R^2
Step 1:			
Pre-deployment physical health symptom	.24*	2.14	.03
Pre-deployment PTSD	-.06	-.54	
Step 2:			
Pre-deployment physical health symptoms	.19*	2.02	.30**
Pre-deployment PTSD	-.24*	-2.37	
Positive military experiences	-.001	-.01	
General overseas military stressors	-.03	-.22	
Negative aspects of peacekeeping	.14	.84	
Potentially traumatizing events	-.10	-.66	
Post-deployment PCL	.57**	5.91	

Note. Model statistics for the physical health symptoms equation is: $F(7, 96) = 6.91, p < .01$.

* $p < .05$; ** $p < .01$.

variables (PMES, GOMS, NAPS, PTES, and PCL severity) were entered sequentially to determine whether they significantly predicted physical health symptoms at post-deployment.

This model accounted for 30% of the variance in post-deployment physical health symptoms. After controlling for baseline physical health and PTSD symptoms, post-deployment PTSD symptoms ($\beta = .57$) emerged as the only significant predictor of post-deployment physical health symptoms. None of the appraisal and exposure variables were significantly associated with post-deployment physical health symptoms.

PTSD as a Mediator Between Exposure and Physical Health Symptoms

Using Baron and Kenny's (1986) guidelines for testing mediation, we found that PTSD mediated the relationship between exposure and physical health symptoms. Exposure was significantly correlated with PTSD symptoms ($r = .33$) and with physical health symptoms ($r = .21$). Additionally, when physical health symptoms were regressed on exposure and PTSD simultaneously, PTSD was significantly related to physical health symptoms ($\beta = .60$, $t = 8.80$, $p < .01$), and the relationship between exposure and physical health symptoms decreased ($\beta = .02$ from $\beta = .21$). The Sobel test indicated that this decrease was significant ($t = 3.90$, $p < .01$). Thus, PTSD was a partial mediator between exposure and physical health symptoms.

PTSD Symptom Clusters as Predictors of Physical Health Symptoms

In order to better understand the unique contribution of each of the PTSD symptom clusters on physical symptom complaints, another series of regression analyses was conducted. Initially, a regression analysis was run with each of the pre-deployment PTSD symptom clusters predicting pre-deployment physical health symptoms. The symptoms clusters entered in Step 1 included: Cluster B (re-experiencing symptoms), Cluster C (emotional numbing and avoidance symptoms), and Cluster D (hyperarousal symptoms). This model accounted for 39% of the explained variance in physical symptoms. Emotional numbing and avoidance symptoms ($\beta = .26$) and hyperarousal symptoms ($\beta = .34$) significantly predicted pre-deployment physical health.

Subsequently, a regression analysis was conducted with each of the post-deployment PTSD symptom clusters predicting post-deployment physical health symptoms. Baseline physical health and PTSD symptoms were entered in Step 1 to partial out the variance attributable to these variables. In Step 2, each of the symptom clusters was subsequently entered. This model accounted for 47% of the variance in physical symptoms. After controlling for pre-deployment physical health and pre-deployment PTSD symptoms, the re-experiencing ($\beta = .18$) and hyperarousal symptoms ($\beta = .58$)

measured at post-deployment significantly predicted post-deployment physical health. Hyperarousal demonstrated the strongest association with physical health complaints in the final model.

DISCUSSION

Several predictors of physical health symptoms were reported by peacekeepers at pre- and post-deployment. First, it was found that more proximal stressors and stress symptoms (i.e., general life stressors and pre-deployment stress symptoms) may be better predictors of physical health symptoms at pre-deployment than past traumatic events. As soldiers are preparing for deployment, they face a number of stressors and challenges that may elevate stress symptoms and exacerbate physical health symptomatology. This finding is consistent with past studies that have demonstrated that peacekeepers exhibit high levels of distress prior to deployment (Bolton et al., 2001; Maguen et al., 2004).

The findings also demonstrated that mission stressors were not directly related to reports of physical health symptoms at post-deployment. Instead, physical health symptoms at post-deployment were better predicted by pre-existing physical health symptoms and stress symptoms. This finding suggests that rather than being acute disturbances, physical-symptom complaints measured in this sample may be enduring complaints of some soldiers, which may reflect ongoing physical disturbances, general negative affectivity, or may result from cumulative stress and adversity.

In addition, it was demonstrated that stress symptoms mediate the relationship between exposure and physical health symptoms, providing further evidence for the finding that levels of exposure to potentially traumatic events are not directly related to physical health complaints but may influence physical health complaints indirectly via reported stress symptoms. This finding is consistent with other studies that have found PTSD to be a mediator in female veterans and combat veterans (Schnurr & Spiro, 1999; Taft et al., 1999; Wolfe et al., 1994).

It was also found that of all the PTSD symptom clusters, hyperarousal demonstrated the strongest association with physical health complaints, signifying that physical health complaints may be a manifestation of general stress and pre-existing hyperarousal difficulties rather than unique mission stressors.

Several limitations to this study should be noted. First, this was a sample of convenience and as a result, generalizability may be greatly limited. Soldiers surveyed were those who were available and willing to participate in the study. Second, only a minority of soldiers agreed to be followed-up at post-deployment. Although reasons for precise refusals are unclear, future studies should investigate this phenomenon more systematically. One could assume that soldiers are protective of their privacy and fear stigmatization by

participating in a post-deployment study. In addition, research may not be a priority for returning veterans who are attempting to re-adjust to civilian life. Furthermore, there were several demographic differences between soldiers who agreed to be followed up and those who did not. Soldiers who agreed to be contacted for follow-up tended to be older, more educated, and have higher rank. The follow-up group also contained more females and fewer ethnic minorities, which limits generalizability. Third, in order to increase generalizability, the sample contained two sub-groups, an AD and RM group. No differences between these groups were noted on physical health symptoms at pre- or post-deployment.

This study suggests that general life-demands and stress are related to physical health complaints. Arguably, this stress and strain affects performance, satisfaction, and well-being. Difficulties with daily hassles and extra-military life-stressors are highly amenable to public health (e.g., public service announcements and brochures) and clinical intervention. It may be prudent to assess extra-military demands and difficulties when soldiers are screened prior to and after deployment. Perhaps a self-test paradigm can be employed whereby a soldier can be prompted to easily score their brief test results and be provided feedback and recommendations for various score ranges. If scores indicate high degrees of strain, they could receive information about clinical services. If soldiers endorse particularly salient stress symptoms, such as severe hyperarousal and sleep difficulties, they could be provided with pamphlets and a list of potential resources for intervention and support. Finally, the military should consider providing more extensive wellness programs emphasizing stress management.

Given that exposure was indirectly, but not directly, related to physical health complaints, future studies should employ more complex models when assessing the relationship between exposure, psychological, and physical health symptoms. Such models should take into account that the physical health of military personnel following deployment is multi-determined. In building a model to predict physical health at post-deployment, pre-existing physical and psychological health, as well as exposure variables during deployment and psychological health following deployment, need to be considered in order to more accurately predict the physical health of military personnel returning from deployment.

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