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Mediating Role of Depression and Anxiety on Somatic Complaints In Georgian Servants With Post Traumatic Stress Disorder

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Abstract

Background and Objectives: The relationship between Post Traumatic Stress Disorder (PTSD) and somatic symptoms and the role of comorbid depression and anxiety has been demonstrated in many studies. The following research explores to what extent depression and anxiety influence the relationship between PTSD and somatic complaints in Georgian peacekeepers.

Design and Methods: PTSD Checklist (PCL-5) for The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and Patient Health Questionnaire (PHQ) was used to collect data in the sample of 75 veterans examined after a 6-month deployment. Two types of parallel mediation model 4 of the SPSS PROCESS macro were used to check different and also joint influences of depression and anxiety on the indirect effect of PTSD on somatic complaints.

Results: When probable mediators were analyzed separately, there was a significant indirect effect of PTSD on somatic complaints: through depression 0.21, 95% CI [0.13, 0.28], and through anxiety 0.13, 95% CI [0.06, 0.21]. After placing both mediators in a parallel model, only depression maintained statistical significance: 0.18, 95% CI [0.09, 0.28]. The ratio of indirect to total effect was 0.66, 95% CI [0.59, 0.75].

Conclusions: The primary finding is that the relationship between PTSD and somatic complaints may be mainly accounted for underlying symptoms of depression rather than anxiety, highlighting the importance of targeting depression symptoms when diagnosing and treating comorbid PTSD and somatic complaints. These new results may affect both management and treatment of PTSD as they acknowledge the importance of anxiety and depression symptoms in somatic complaints.

Keywords: military; mediation; PTSD; depression; anxiety; somatic complaints; deployment

Introduction

The costs of warfare activities include the treasure spent and the invisible wounds of the warriors and their families. The psychological and physical well-being of military service members is crucial for performing their duties. Soldiers often experience specific stress due to their professional activity (Laurence & Matthews, 2012). Therefore, one of the most prevalent mental health issues among military personnel is post-traumatic stress disorder.

Georgian Armed forces joined the international operations as far back as 1999 as a part of Kosovo Forces (KFOR). In 2003 Georgian armed forces joined the peacekeeping mission in Iraq, and since 2004 Georgian military service members have been serving in NATO missions in Afghanistan (Tevzadze, 2014).

Military servants are under the cumulative effect of different stressors, such as prolonged separation from beloved ones, frequent relocations, physical exhaustion, sleep deprivation and the ever-present threat of injuries and fatal outcomes. As a result, high rates of PTSD, comorbid disorders, and suicide attempts do not come as a surprise (Cesur et al., 2013; Hoge et al., 2006; Pearson et al., 2014; Pickett et al., 2015; Seal et al., 2009; Vyas et al., 2016). Rates of PTSD are high in active combatants and non-combatants deployed to Iraq (Peterson et al., 2010). It is also worth mentioning that modern combat strategy adds specific stressors for active military service members (Jean-Louis et al., 2013). As another longitudinal article states, combat exposure predicts early death, not considering whether the subject is diagnosed with PTSD, which becomes apparent as the older age nears and health deteriorates (Lee et al., 1995).

On the other hand, different physical complaints are the most frequent reason for absenteeism/exclusion and restriction of functioning for active-duty military personnel (Walker, 2010). Most general and well-studied somatic complaints among military service members are different pain symptoms (Rintala et al., 2015; Truszczyńska et al., 2012). Several studies show the meaningful relationship between pain and PTSD (G. J. Asmundson et al., n.d.; Bosco et al., 2013; Helmer et al., 2009; Osório et al., 2012; Phillips et al., 2016; Shipherd et al., 2007; Villano et al., 2007). Somatic complaints are not limited to one particular disease state since patients who have PTSD seem to have a wide range of physical complaints, such as cardiovascular problems, headaches, musculoskeletal disorders and so on, leading to chronic pain (Shipherd et al., 2007). Furthermore, other somatic symptoms like dizziness, nausea, stomach ache, fatigue, numbness, and other health problems are often associated with post-traumatic stress (Baker et al., 1997; Gupta, 2013; Hoge et al., 2007; Vasterling et al., 2008). Shipherd et al. (Shipherd et al., 2007) showed a strong link between the variables in question, namely, 66% of veterans diagnosed with PTSD had comorbid chronic pain.

Following the initial prevalence studies, research has also been conducted to elaborate on the complex relationship between PTSD and somatic complaints. Outcomes of the study that analyzed data from OIF/OEF/OND veterans with chronic musculoskeletal pain and PTSD are that service members with comorbidity experienced higher pain severity, more significant pain-related disability, increased pain interference, more maladaptive cognitions related to pain (pain catastrophising, pain centrality, pain self-efficacy), and higher effective distress than those with chronic pain only (Ang et al., 2014). People with comorbid PTSD and chronic pain report increased symptoms of PTSD, pain, anxiety, depression, disability, and opioid use compared to those with just one of these conditions (Kind & Otis, 2019). According to another study, individuals with pain and PTSD, in contrast to those with pain only, are more prone to think that they manage their pain effectively, strongly believe that emotions have a more significant influence on the pain (Alschuler & Otis, 2012).

Several theories have been proposed to explain the increased risk of developing chronic pain in patients with PTSD. One of them is the "shared vulnerability" model, which implies complex mechanisms mediating the link between PTSD and pain. The mechanism is based on anxiety sensitivity, which increases the intensity of fear and anxiety and has been found to be a predisposing factor for PTSD and pain (G. J. G. Asmundson et al., 2002). Another one – the "mutual maintenance" model (Sharp & Harvey, 2001), highlights that the comorbidity of PTSD and pain leads to broader restriction of the sufferer's functionality as the patient overreacts to physically and psychologically painful stimuli. Thus, this cycle of avoidance further reinforces the disability (Shipherd et al., 2007).

The results of the several studies of veterans deployed in OIF/OEF/OND suggest that the most critical factors among other psychiatric and behavioral comorbidities that influence functional disability of military service members are depression, PTSD, TBI, substance abuse, anxiety disorders, chronic pain and sleep disorders (Hoge et al., 2008; Lippa et al., 2015; Schneiderman et al., 2008). The assessment and therapy may become hindered by multiple shared symptoms among these disorders and other comorbid psychiatric and behavioral conditions (Bryant, 2011; Stein & McAllister, 2009).

PTSD and depression are highly comorbid. Raab et al. (2015) showed that both disorders are associated with decreased quality of life separately. A detrimental impact on veterans' social interactions and psychological well-being in comorbidity is far more significant. Furthermore, in the case of comorbidity, depression has a stronger influence on the decreased quality of life than PTSD. Another research concluded that PTSD is more

prevalent among primary care patients suffering from depression than previously thought. Thirty-six per cent of depressed patients tested positive for PTSD (Campbell et al., 2007). Depression also demonstrates high co-occurrence with pain, and the adverse effect of comorbidity on quality of life is even higher (Kroenke et al., 2011). Research by Armenta et al. (2019), studying longitudinal trajectories of comorbid PTSD and symptoms of depression in U.S. service members and veterans, concluded that comorbid PTSD and major depressive disorder symptoms move in tandem with each other.

In a longitudinal study of veterans of Lebanon, war participants were assessed on PTSD, anxiety, and depression at three different time spans - after 1, 2 and 20 years from participation in the war. Results showed that at any period, triple comorbidity prevalence was higher than the rates of PTSD alone or comorbid with anxiety or depression and was linked to more hindered functioning of the study participants (Ginzburg et al., 2010).

Comorbidity is high in people with PTSD, with 80–90% of people with PTSD reporting one or more comorbidities and two-thirds receiving two or more concurrent diagnoses (Kessler et al., 1995).

Comorbid anxiety in patients with PTSD is well-documented (Rauch et al., 2010). Several studies have demonstrated worse health outcomes for patients with anxiety and PTSD than only those with PTSD. Moreover, Roy-Byrne et al. (Roy-Byrne et al., 2008) showed that anxiety disorders are strongly and independently associated with chronic medical illness, low physical health-related quality of life, and physical disability. The same study found that the severity of anxiety was significantly increased in individuals with chronic pain and that chronic pain is more associated with anxiety disorders than depression. Elklit & Christiansen (Christiansen & Elklit, 2008) highlighted the significant predictive value of anxiety disorders for somatic complaints and depression. Jakupcak et al. (Jakupcak et al., 2006) found that the relation between PTSD and somatic complaints in a veteran sample seeking inpatient treatment was accounted for by depression and anxiety sensitivity.

Moreover, it should also be taken into account that anxiety and depression share comorbidity with PTSD and somatic complaints separately and in conjunction. They also influence each other's severity (Ask et al., 2016). Some theories offer possible explanations. For example, a tripartite model states that depression and anxiety have a significant component labelled as "negative affectivity" in common, although they also retain some unique elements of variance (Eley & Stevenson, 1999). Biological mechanisms are also suggested to explain HPA axis functioning (de Kloet et al., 2006; Faravelli et al., 2012; Varghese & Brown, 2001).

There are relatively few studies exploring the mediating effects of depression and anxiety on the relationship of PTSD with somatic symptoms. For instance, Irwin et al. (Irwin et al., 2014) investigated the mediating effects of depression, anxiety and alcohol use in PTSD and pain relation. Poundja et al. (Poundja et al., 2006) explored the role depression played in the co-occurrence of PTSD and pain. Jakupcak et al. (Jakupcak et al., 2006) used a proxy risk factor model to see the role of mediation of depression and anxiety sensitivity in the interconnection of PTSD and different somatic complaints.

Authors of the subsequent article have previously published the first article to extend the empirical evidence accumulated by Irwin et al. (2014), Poundja et al. (2006), and Jakupcak et al. (2006). The previous article aimed to underlie symptoms of depression and anxiety to explore the association between PTSD symptoms and somatic complaints in Georgian military personnel. The article included a full range of PTSD symptom severity scores and a large sample of study participants. This article found that the overall indirect effect of PTSD on somatic symptoms was significant in depression and anxiety (Sikharulidze et al., 2017).

The previous research included an entire cohort, meaning everyone who participated in the study regardless of their clinical diagnosis. The current one only analyses the results of those diagnosed with PTSD. As in the previous study, the same model was used to extend the empirical evidence on the indirect effect of PTSD on somatic complaints by exploring the mediating role of depression and anxiety separately and studying their joint influence in the parallel model. In the following article, this method was used to reveal a new important research question, and the study data was re-processed only for those with PTSD diagnose. Moreover, the following study investigates the broad spectrum of somatic

complaints. We hypothesize that comparing these two models may give us more opportunities better to understand the role of these two probable mediating variables.

Method

Participants and procedure

Research participants all were addressed to the Psychological Recruitment and Monitoring Department, Ministry of Defence of Georgia, with a preliminary clinical diagnosis of PTSD. All of them were veterans who had returned from a 6-month deployment as part of the International Assistance Security Force (ISAF) in Afghanistan in 2014 and 2015. They had been exposed to conventional war zone stressors, including combat situations, bilateral fire, de-mining procedures, patrolling, witnessing injuries and fatalities and getting injured. All 75 participants were Caucasian males. The mean age was 28.7 years (*SD* = 5.8, *range* = 20-47).

Data were obtained in 2014 and 2015. The veterans all had a preliminary diagnosis of PTSD, which later was confirmed by the PTSD Checklist for DSM-5 (PCL-5). The participants also completed a 15-item somatic subscale of the Patient History Questionnaire (PHQ-15), a 9-item depression subscale of the Patient History Questionnaire (PHQ-9), and a 7-item anxiety subscale of the Patient History Questionnaire (GAD-7).

The study's self-administered questionnaires were part of the pre-and post-deployment procedures and were approved by Georgia's Minister of Defense. Prior to the study, all participants signed an informed consent document allowing the data to be used for scientific analyses. The Independent Bioethics Committee at Simon Khechinashvili University Hospital approved the study. The Helsinki Declaration rules (WMA General Assembly, 1964) also were followed.

Measures

PTSD is assessed by PTSD Checklist for DSM-5 (PCL-5), a self-report instrument. PCL-5 is a reputable and broadly used measure compatible with DSM 5. Unlike PCL-4, which differentiated civilian, military and specific versions, PCL-5 now encompasses all. It is often used for screening PTSD in military personnel (Otis et al., 2010; Rice et al., 2015; Vasterling et al., 2008). PCL-5 allows clinicians to analyze the scores in two ways to rule out false negatives and false positives; the cut-point score should be equal to or higher than 33 (Blevins et al., 2015; Bovin et al., 2015) and the DSM-5 Diagnostic rule of endorsing the existing symptoms should be followed. It contains 20 statements, and each of them is rated on the 5-point Likert scale from 0 to 4. The measure also enables the researcher to obtain DSM-5 symptom cluster severity scores, which adds more precision to the diagnostic and treatment process. PCL-5 is a psychometrically sound measure (Bovin et al., 2015; Wortmann et al., 2016). Following the established guidelines, PCL-5 was adapted for the Georgian population showing good psychometric properties, namely, high internal consistency (α= .924) was found.

Depression, anxiety and somatic complaints were assessed by Patient Health Questionnaire (PHQ) screeners. PHQ is a self-report instrument (Spitzer et al., 1999) that assesses mental disorders, including depression, anxiety disorder, somatic complaints, alcohol use and eating disorders. The instrument is actively used in military environments and has good psychometric properties (Jakupcak et al., 2006; Killgore et al., 2006). Following PHQ screeners were used: a 9-item scale of depression (PHQ-9), which investigates the presence and the severity of depression symptoms. Somatic complaints are measured with another module – PHQ-15. The third sub-scale - GAD-7, measures anxiety. This measure was also adapted for use in the Georgian population. Good internal consistencies were displayed for all scales in interest (depression subscale's internal consistency - α = .836; anxiety subscale – α = .832, the subscale of somatic complaints – α = .824).

Data analysis

The data of the present study were analyzed using IBM SPSS Version 22. In order to assess correlations between PTSD, depression, anxiety symptoms and somatic complaints, Pearson's coefficients were used.

To test the indirect effects of PTSD on somatic complaints and the role of depression and anxiety in this relation, the SPSS PROCESS macro V2.16 developed by Hayes (*The PROCESS Macro for SPSS, SAS, and R - PROCESS Macro for SPSS and SAS*, n.d.) was applied. In the first step of data analysis, we used model 4 separately for depression and anxiety to test their role in the indirect effect between PTSD and somatic

complaints. In the second stage, we used model 4 (parallel mediation) of SPSS PROCESS macro to understand their joint impact on the relation between PTSD and somatic complaints. The present script operates under bootstrapping method, involving parallel data sets relying on random sampling with replacement. This method assesses the mediation effect and is robust against deviations from normality (Hayes, 2013; Preacher & Hayes, 2008). The mediation hypothesis was assessed by splitting the relation between PTSD and somatic complaints into a direct and indirect effects. One thousand bootstrap samples were used to assess 95% confidence intervals of these effects. If the CI of the indirect effect did not include zero, we would conclude that there was a statistically significant indirect effect (Hayes, 2009; Preacher & Hayes, 2004).

Missing items resulted in cases where the remaining non-missing items had higher values. Hence, assuming a missing at random mechanism, we imputed the missing information for that measure by the individual's median value of the completed items. This single imputation method was considered appropriate because of the very small amount of missing information (missing data existed in < 1.5% of cases and < 0.1% of items on the PHQ-15 questionnaire).

Results

Table 1 shows the prevalence of severity levels for somatic complaints, depression, and anxiety.

Table 1. *Prevalence of Depression, Anxiety, and Somatic complaints severity*

	Mild (Low)		Moderate (Medium)		Moderately severe		Severe (High)	
	n	*%*	*n*	*%*	*N*	*%*	*n*	*%*
Depression	28	37.3	10	13.3	5	6.7	3	4.0
Anxiety	30	40.0	15	20.0			6	8.0
Somatic complaints	34	45.3	12	16.0			6	8.0

Note. (*N =75*) Mild, Moderate, Moderately severe, Severe - Depression

Mild, Moderate, Severe – Anxiety

Low, Medium, High – Somatic complaints

Table 1 shows the prevalence of severity levels for other variables. Somatic complaints were reported as mild to severe in 9.8% of the participants, while in 1.8% of the soldier, somatic complaints were reported as moderate to severe. The prevalence of separate somatic symptoms is presented in table 2.

Table 2. *Prevalence of Somatic Complaints*

	Bothered a lot		Bothered a little		Not bothered at all	
	N	*%*	*n*	*%*	*n*	*%*
Stomach Pain	4	5.3	24	32.0	47	62.7
Back Pain	5	6.7	33	44.0	37	49.3
Pain Arms, Legs or joints	6	8.0	30	40.0	39	52.0
feeling tired or having low energy	14	18.7	38	50.7	23	30.7
Trouble sleeping	18	24.0	32	42.7	25	33.3
Pain or problems during sexual intercourse	1	1.3	6	8.0	68	90.7
Headaches	11	14.7	36	48.0	28	37.3
Chest pain	1	1.3	8	10.7	66	88.0
Dizziness	3	4.0	35	46.7	37	49.3

Fainting spells	1	1.3	6	8.0	68	90.7
Feeling your heart pound or race	4	5.3	31	41.3	40	53.3
Shortness of breath	3	4.0	25	33.3	47	62.7
Constipation, loose bowels, or diarrhea	5	6.7	24	32.0	46	61.3
Nausea, gas, or indigestions	6	8.0	28	37.3	41	54.7

Note. (*N =75*)

Descriptive statistics display a slightly skewed distribution of symptoms in this cohort. Pearson's correlations (r = 0.54-0.80; p < 0.001) analysis results show that the relation between variables is significant. PTSD symptoms were significantly correlated with somatic complaints, anxiety, and depression. Depression and anxiety symptoms were both significantly correlated to somatic complaints. The results are presented in Table 3.

Table 3. *Descriptive statistics and Pearson correlations*

Variable	Mean	*SD*	1.	2.	3.	4.
1. PTSD	4.52	7.71	□	.67***	.58***	.54***
2. Depression	.96	2.23		□	.80***	.75***
3. Anxiety	.97	2.15			□	.64***
4. Somatic Complaints	1.37	2.40				□

Note. N = 75, ***p < .001

In the first stage, mediation model 4 of PROCESS macro by Hayes was used to analyze the indirect effect separately for depression and anxiety (Andrew Hayes & Rockwood, 2016). Figure 1 showed the indirect effect of PTSD on somatic complaints when depression was included separately as a probable mediator 0.21, 95% CI [0.13, 0.28].

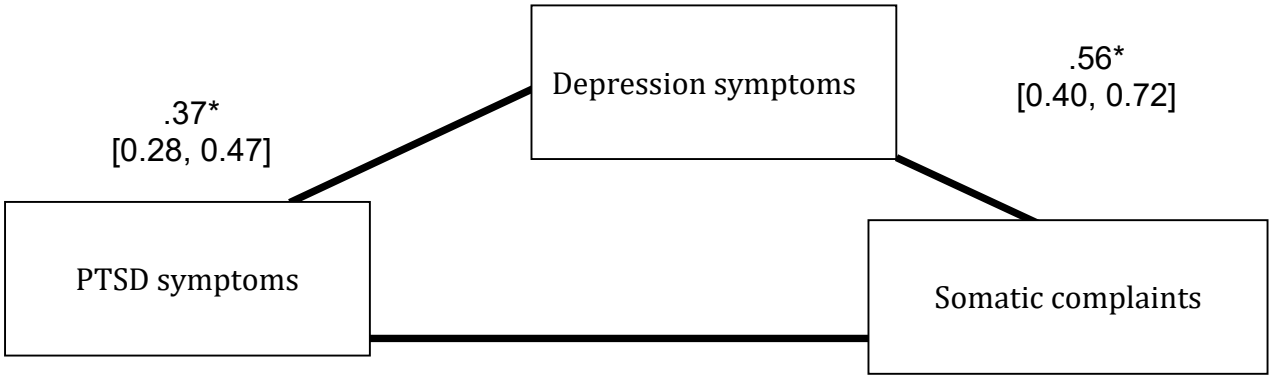

Figure 1. Mediation model 4 analyzed depression separately as a mediator in the relationship between PTSD and somatic complaints. Model statistics for the direct model: R^2 = .2885, F(1, N = 73) = 29.5932, p < .001. For the mediated model: R^2 = 5709, F(2, N =72) = 47.8885, p < .001. Unstandardized path coefficients marked with an asterisk represent bootstrap confidence intervals that do not include zero and significant (p < 0.001). The total indirect effect of PTSD on somatic complaints: 0.21, 95% CI [0.13, 0.28]

Figure 2 shows the same relationship through anxiety: 0.13, 95% CI [0.06, 0.21]. Confidence intervals for these indirect effects did not include zero, suggesting significant indirect effects through both probable mediators.

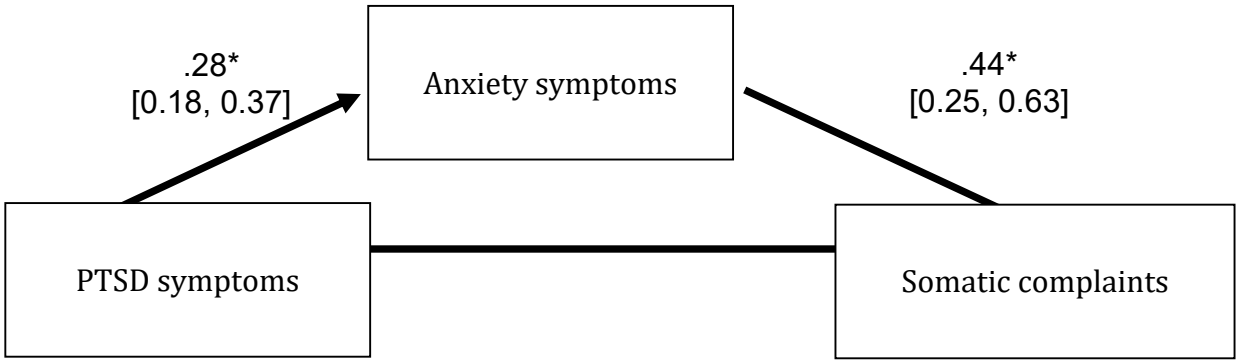

Figure 2. Mediation model 4 analyzed anxiety separately as a mediator in the relationship between PTSD and somatic complaints. R^2 = .2885, F (1, N = 73) = 29.5932, p < .001. For the mediated model: R^2 = .4538, F(2, N =72) = 29.5952, p < .001. Unstandardized path coefficients marked with an asterisk represent bootstrap confidence intervals that do not include zero and significant (p < 0.001). The total indirect effect of PTSD on somatic complaints: 0.13, 95% CI [0.06, 0.21].

In the second stage, parallel mediation model 4 by Hayes was used to check the joint influence of depression and anxiety on the association between PTSD and somatic complaints. The results of this step are shown in Figure 3, which presents that the indirect effect of PTSD through depression on the somatic complaints was 0.18, 95% CI [0.09, 0.28], and through anxiety was 0.03, 95% CI [-0.04, 0.11]. In this model, the indirect effect of depression is significant, considering that confidence intervals did not include zero.

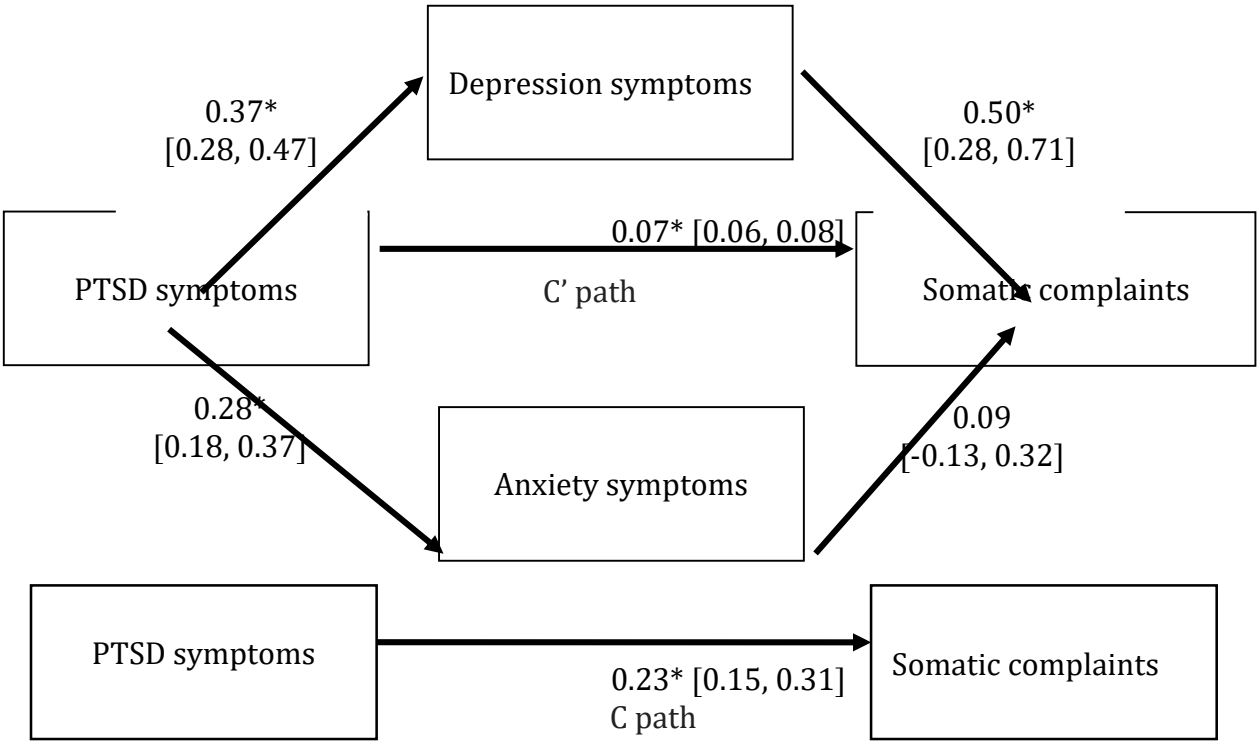

Figure 3. Relationship between posttraumatic stress disorder (PTSD) and somatic complaints, and the mediating effect of depression and anxiety. Model statistics for the direct model: R^2 = .2885, F(1, N = 71) = 29.5932, p < .001. For the mediated model: R^2 = .5749, F(3, N = 72) = 32.0098, p < .001. Unstandardized path coefficients marked with an asterisk identify 95% bootstrap confidence intervals which do not include zero and significant level *(p < 0.001).* The total indirect effect of PTSD on somatic complaints: 0.21, 95% CI [0.13, 0.29].

In contrast, anxiety's indirect impact is not substantial as confidence intervals have zero. The indirect to total effect ratio was 0.89, 95% CI [0.55, 1.36]. This result shows that almost all of the total effects of PTSD on somatic complaints are indirect effects through depression and/or anxiety, and according to the joint model, depression prevails. A sensitivity analysis where overlapping items of racing heart and sleep problems were removed from the data showed congruent results to the main analyses.

Discussion

This study examines comorbid mental health problems in peacekeeping missions participant veterans diagnosed with PTSD for the first time in Georgia. Our findings suggest that depression and anxiety, analyzed separately, significantly influence the indirect effect of PTSD on somatic complaints. However, analyzing these variables jointly showed that depression has a statistically significant effect, whereas anxiety could not display statistical significance.

The previous study (Sikharulidze et al., 2017) helped us understand the comorbid mental health problems when the symptoms of PTSD and somatic complaints are present. Therefore, the subsequent article explores the same questions more in-depth within the smaller population, those diagnosed with PTSD.

The following research results are in accordance with other studies and show that the severity of depression and anxiety symptoms separately influence the relationship between PTSD and somatic complaints (Irwin et al., 2014; Jakupcak et al., 2006; Poundja et al., 2006). They also reveal congruence with the previous studies on active military service members and demonstrate that somatic complaints are extensive in military personnel and are affected by comorbid mental problems associated with PTSD (Engel et al., 2000; Rice et al., 2015; Wolfe et al., 1994).

Several theoretical frameworks are applicable to explain the complex mechanism of interconnection between PTSD and somatic complaints and whether this relationship can be accounted for comorbid depression and anxiety. One of the most discussed approaches is that these disorders share a common concept of negative alterations in cognitive functioning; namely, negative thinking observed in patients with PTSD (Olszewski & Varrasse, 2005; Walters, 2015; Xiong et al., 2013), overall pessimistic thoughts characteristic of depression (Beck, 2011), threat-oriented attention bias in anxiety disorders (Sipos et al., 2014) and catastrophising about pain in patients with comorbid somatic complaints, depression and anxiety (Börsbo et al., 2009).

Many researchers also highlight the importance of shared symptoms, like sleep disorder in PTSD, anxiety and depression (Asnis et al., 2012; Maher et al., 2006; Nutt et al., 2008), avoidant behavior, sense of guilt and shame common for both PTSD and depression (Bosco et al., 2013; Taylor, 2015), concentration problems, fatigue mutual for depression and anxiety (Cameron, 2007).

The theory suggested by Harvey and Sharp (Sharp & Harvey, 2001) states that different factors such as selective attention, anxious perception, avoidance, passive coping style, and inactivity reinforce mutual maintenance of PTSD and pain. The same factors are prominent for depression and anxiety (Irwin et al., 2014).

It is noteworthy that anxiety and depression share comorbidity with PTSD and somatic complaints separately and in conjunction and influence their severity (Ask et al., 2016). One of the theories addressing this issue is a tripartite model, which states that depression and anxiety have some characteristics in common. At the same time, they retain specific components of variance as well. The shared component labelled as "negative affectivity" refers to a general tendency to experience emotional distress (Clark & Watson, 1991), although the distinctive characteristic is that a low level of positive affect is uniquely associated with depression. In contrast, somatic arousal is uniquely associated with anxiety (Eley & Stevenson, 1999).

The HPA axis as a biological mechanism could explain the association between PTSD and comorbid disorders; namely, its dysfunction in patients with PTSD leads to some somatic complaints (Gupta, 2013). The HPA axis activity increases in patients with depression (Varghese & Brown, 2001). Finally, HPA axis malfunctioning is a risk factor for aggravating different mental disorders and, in particular, anxiety disorders (Faravelli et al., 2012).

The fact that depression, unlike anxiety, maintained statistical significance in our joint model and was a more robust mediating variable than anxiety in the separate model could be explained by overlapping symptoms of these disorders. Roy-Byrne and Katon suggest that depression includes all main symptoms of General Anxiety Disorder (1997). Ask et al. (Ask et al., 2016) conducted research in accordance with the tripartite theory and found that anxiety, depression, and somatic complaints represent various symptoms of the same disorder rather than three distinctive entities. However, the unique characteristics of each variable were also demonstrated, supporting the independence of these disorders.

Several limitations should be taken into account while interpreting the findings. First, the sample cohort was highly homogeneous, and all participants were Caucasian males. Secondly, using self-administered questionnaires might increase the tendency of self-biased and socially desired answers. Third, due to the lack of sociodemographic statistics, essential factors such as the number of deployments, injury records, and exposure to battle situations were not considered. Fourth, recruiting participants in the military system through a mandatory process may also have affected the participants' responses. And lastly, the cross-sectional design of this study does not determine causal relationships between the variables (Maxwell et al., 2011).

In conclusion, several theoretical and practical recommendations could be modestly suggested. Namely, the increased probability of underlying depression and anxiety should be considered while diagnosing and treating military personnel with comorbid PTSD and somatic complaints. Further study with a diverse population and different types of traumatic experiences would be beneficial to substantially understand the complex mechanism of comorbidity of PTSD and somatic complaints. Further study is required to investigate the multi-directional mediation effect. Further study is needed to investigate the mediation effect in several directions. This study can be considered preliminary research, which needs a more extended investigation of other populations (e.g., civilians with different traumatic experiences) to see if these mediating phenomena can be rightfully generalized. Moreover, the longitudinal study can be utilized to establish causal relationships.

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