

Relations Between Physical and Emotional Health and Psychological Stress in Trauma-Exposed Veterans with Emotional Disorders

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Abstract

Background: Exposure to potentially traumatic events (PTEs) is common, especially in veterans. There are psychological sequelae to PTE exposure, including stress and anxiety pathology, depressive symptoms, and PTSD. Identifying veterans at risk for elevated psychological distress following PTEs, as well as distress correlates, is critical to improving mental health screening efforts and minimising downstream adverse outcomes. Two correlates, emotional and physical wellbeing, are typically examined in isolation. Understanding unique and/or synergistic relations between emotional wellbeing, physical wellbeing, and distress in veterans, and how relations vary across distress outcomes (i.e., depressive symptoms, anxiety, stress), would facilitate an understanding of the unique contribution of these correlates in trauma-exposed veterans.

Method: Four-hundred and ninety veterans participating in randomised controlled trials of cognitive-behavioural interventions in a United States Veterans Affairs Healthcare System were included. Pearson correlations, regressions and a path analysis were used to examine relationships between wellbeing domains and psychopathology, with varying sample sizes across analyses due to missing data.

Results: Higher levels of emotional wellbeing and fewer role limitations due to emotional difficulties were associated with lower stress and depressive symptoms. Results were similar for anxiety, except that physical wellbeing was also related to lower anxiety.

Conclusion: Results suggest meaningful, distinct relations between wellbeing domains across distress outcomes, which inform wellbeing/quality-of-life theory, the knowledge base on protective factors for distress outcomes in trauma-exposed samples, and screening and intervention efforts. Regarding the relationships among emotional wellbeing, physical wellbeing, and distress, emotional wellbeing may be a stronger contributor.

Keywords: veterans, depressive symptoms, anxiety, stress, wellbeing

Introduction

Experiencing potentially traumatic events (PTEs) is common, with a PTE exposure rate of 89.7% in national prevalence estimates¹ and 70.4% with international estimates.² There are numerous psychological sequelae of PTE exposure. Sequelae include, but are not limited to, problematic substance use, depressive symptoms and anxiety.³ Psychological PTE impacts are heterogeneous across populations and variables due to psychosocial factors.⁴ For example, PTSD is more common in military personnel relative to civilians following PTEs (14–16% in veterans),⁵ likely due to military service-specific variables (combat exposure).⁶ Environmental factors, such as social support, also protect against post-traumatic psychopathology development.⁷

Efforts to identify veterans at risk for elevated psychological distress following PTEs, as well as distress correlates, are critical to improving mental health screening efforts, minimising downstream adverse outcomes, and informing the knowledge base of relevant correlates and distinct relations to distress. Such efforts may help reduce the burden on health systems and providers.

One sequelae^{8,9} of PTE exposure and a potential amplifier of adverse mental health in veterans is poor physical health.¹⁰ Experience of PTEs and combat exposure places veterans at risk for physical health difficulties, examples of which include diabetes, arthritis, chronic pain, and stroke.^{11,12} Relations between physical and emotional health are both reciprocal and unidirectional, depending on the

population studied.^{13,14} There is evidence suggesting bidirectional relations between PTSD symptom severity and physical health in female veterans, wherein PTSD symptoms influence physical health outcomes and vice versa. Unidirectional relations between PTSD and physical health are evident in male veterans¹⁴ with PTSD, placing individuals at risk for adverse downstream physical health. In briefly summarising mechanisms linking physical and emotional health, most are biopsychosocial.¹⁵ For example, allostatic load may result from PTE experience.¹⁶ At a broad level, allostatic load theory suggests that prolonged stress exposure can over activate bodily systems, dysregulating the body's stress response. If a veteran experiences a combat-related trauma or prolonged trauma (or a civilian experiences a separate PTE or multiple/prolonged PTEs), prolonged hyperarousal resulting from trauma exposure may negatively impact body systems and, therefore, manifest in physical health difficulties.

Clearly, there is a strong connection between mental and physical health in veterans exposed to PTEs. While there are robust, reciprocal relations between physical health and emotional health outcomes due to PTE exposure and subsequent allostatic load in veterans, it remains unclear how emotional and physical health, as well as functional impairment resulting from emotional and physical difficulties, simultaneously and distinctly relate to changes in stress and related psychopathology in trauma-exposed veterans. Emotional and physical wellbeing are also understudied in veterans relative to disability/poor functioning. Research suggests stronger relations between psychosocial domains of emotional functioning and PTSD, relative to relations between physical health and PTSD.^{17,18} More recently, Elliott et al. showed that psychosocial domains and emotional and physical wellbeing each uniquely relate to depressive symptoms,¹⁹ suggesting that the strength of associations between emotional and physical wellbeing, psychosocial factors and mental health outcomes varies depending on the outcome. Understanding shared and distinct relations between emotional and physical wellbeing, role limitations due to these difficulties, and psychopathology in veterans, and how relations vary across distress outcomes (i.e., depressive symptoms, anxiety, stress), contributes to an understanding of unique protective factors of distress in trauma-exposed veteran samples.

Present study

The present study is a secondary analysis of cross-sectional data examining relations among emotional and physical wellbeing, role limitations

due to emotional and physical difficulties, and distress (i.e., depressive symptoms; anxiety; stress). Relations between physical health, emotional health, and psychological distress are understudied in veterans, as are emotional and physical wellbeing more broadly. A large sample of trauma-exposed veterans participating in two randomised controlled trials for emotional disorders was included. The primary aim was to examine whether associations between physical and emotional wellbeing indicators and distress were consistent across depressive symptoms, anxiety and stress.

Given the extant literature, we hypothesised that physical wellbeing and limitations due to physical difficulties would be uniquely related to depressive symptoms, anxiety and stress, even when controlling for emotional wellbeing and limitations due to emotional difficulties. Given sex- and race-based differences across mental and physical health outcomes,^{14,20} we controlled for these variables in primary analyses. Psychiatric comorbidity (receiving more than one psychiatric diagnosis) was also controlled for, given relations between comorbidity and psychopathology.²¹ Based on results obtained from primary analyses, a path model was calculated to succinctly capture relations between independent and dependent variables analysed.

Method

Participants

For the current study, 490 veterans with emotional disorders provided baseline data as part of two psychotherapy trials of Transdiagnostic Behavior Therapy (Veterans Affairs Office of Research and Development grant #110 RX002910 and CSR&D grant #I01 CX001846 [Principal Investigator: Gros]). Recruitment occurred in outpatient clinics at a large United States Southeastern Veterans Affairs Healthcare System (VAHCS). Inclusion criteria were: 1) competence to consent; 2) meeting criteria for PTSD, major depressive disorder, or panic disorder on a diagnostic interview; 3) PTE exposure as assessed by the Anxiety and Related Disorders Interview Schedule for DSM-5 (ADIS-5); and 4) aged 18–80. Exclusion criteria included: 1) psychiatric hospitalisation or suicide attempt within the last two months; 2) medical conditions interfering with the trial protocol or likely to cause hospitalisation during the study period; 3) new psychiatric medication started within the past four weeks; and 4) meeting diagnostic criteria for a bipolar disorder, personality disorder or psychotic disorder based on a chart review conducted as part of the study. For the 490 participants, the mean age was 45.51 ($SD = 13.13$).

Participants were mostly White (49.80%) or Black (41.04%) and were predominantly male (70.41%).

Procedure

The VAHCS research and development committee and the university-affiliated Institutional Review Board approved the study procedures (initial approval reference number: Pro00093517). The study occurred between October 2020 and December 2024. Participants completed an initial intake appointment to determine eligibility. Masters'-level project assessors completed initial intake assessments, with supervision from a licensed clinical psychologist and the parent study principal investigator. Informed consent was obtained.

Measures

Demographics

Participants completed a comprehensive battery of demographic items assessing age, race and gender.

Anxiety and Related Disorders Interview Schedule-5

The Anxiety and Related Disorders Interview Schedule for the Diagnostic and Statistical Manual of Mental Disorders-5th Edition (ADIS-5)²² was administered at intake to assess psychiatric disorders and determine eligibility for study participation. Psychometric properties of the ADIS-5 are excellent.²² For the primary project, independent raters scored 20% of diagnostic interviews. There was acceptable interrater agreement for diagnoses of MDD (88%), PTSD (81%), and panic disorder (92%) across assessment points. Consistent with scoring criteria,²² principal diagnoses were made using the most severe ADIS interference and distress scale scores.

Depression Anxiety Stress Scales 21-Item Version

The Depression Anxiety Stress Scales-21 (DASS-21)²³ includes 21 items and was administered as part of the baseline measure battery. There are three DASS-21 subscales: depression, anxiety and stress. The depression subscale assesses dysphoria, while the anxiety subscale assesses physiological arousal and cognitive anxiety. The stress subscale assesses tension and agitation. Items are rated on a 0–3 ('did not apply to me at all' to 'applied to me very much or most of the time') scale, with the time frame of reference of one week. The DASS-21 has strong psychometrics.²³ Internal consistency alpha was excellent (0.86–0.91) across DASS-21 subscales.

Veterans Short-Form Health Survey

The Veterans Short-Form Health Survey (V/SF-36)^{24,25} is a 36-item measure designed to assess physical and emotional health in veterans. Items are rated on Likert-type scales, grouped by subscales (e.g., physical functioning, role limitations due to physical health, emotional wellbeing, role limitations due to emotional problems) and re-scored on a 0–100 scale. Higher scores suggest higher functioning/life quality across subscales. The V/SF-36 has excellent psychometric properties. The current study used only the emotional and physical wellbeing, and role limitations due to emotional and physical difficulties scales to determine unique relations with distress. Internal consistency alphas across the four subscales were good, ranging from 0.78–0.93.

Data-analytic plan

Data cleaning

Data were screened for accuracy errors, missing data and multivariable assumptions. Full-information maximum likelihood estimation was used to impute missing data for the path analysis. Only participants with complete V/SF-36 data were used in correlations and regression analyses, as individuals were generally missing >5% of their data. Imputation was not conducted for those missing >5% of their data to avoid replacing a large percentage of participant-level data. The specific *N* for each analysis is described in detail below.

Pearson bivariate correlations

Pearson bivariate correlations were calculated to examine associations between physical health scales (V/SF-36), emotional health scales (V/SF-36), stress, depressive symptoms and anxiety scales (DASS-21), and comorbidity (ADIS-5). Comorbidity was operationalised as the number of psychiatric diagnoses identified by the ADIS-5.

Hierarchical regression

Regressions were calculated in two steps across the three DASS-21 subscales. The first step included age, dichotomised race, self-reported sex and number of psychiatric diagnoses, considering the influence of these variables.^{14,20,21} Next, we added physical wellbeing, emotional wellbeing, limitations due to physical difficulties, and limitations due to emotional difficulties in step two in each of the three models. *R*² change values and standardised coefficients were used for interpretation, along with *F* statistics.

Path analysis

Based on regression and correlation results, we modelled relations among emotional wellbeing, physical wellbeing, role limitations due to emotional difficulties, role limitations due to physical difficulties, and depressive symptoms, anxiety and stress. Fit indices used to assess model fit were root mean square error of approximation and standardised root mean square residual.²⁶⁻²⁸ Standardised coefficients were used for interpretation of path analysis parameters. Full-information maximum likelihood was used to impute missing data, unless participants lacked data for any of the variables of interest in these models. If they had no data, they were excluded from the path analysis (to avoid replacing all missing data for a participant).

Results

Pearson correlations

All Pearson correlations, including sample sizes, are presented in Table 1. Greater levels of depressive symptoms (DASS-21) were associated with worse physical wellbeing, emotional wellbeing, role limitations due to physical difficulties, and role limitations due to emotional difficulties (V/SF-36; r_s from -0.74 to -0.22, $p_s < 0.001$). Results were similar for both anxiety (r_s from -0.52 to -0.34, $p_s < 0.001$) and stress (r_s from -0.54 to -0.18, $p_s < 0.01$) DASS-21 subscales. Individuals with more psychiatric diagnoses also reported worse physical wellbeing, emotional wellbeing, and more limitations due to both emotional and physical difficulties (r_s from -0.26 to -0.12, $p_s < 0.05$).

Table 1. Bivariate Pearson Correlations

Variable		Depression	Anxiety	Stress	Physical	Emotional	Physical role	Emotional role	Dx
1. Depression	n	—							
	r	—							
	p	—							
2. Anxiety	n	334	—						
	r	0.584	—						
	p	<0.001	—						
3. Stress	n	328	325	—					
	r	0.656	0.672	—					
	p	<0.001	<0.001	—					
4. Physical	n	325	323	315	—				
	r	-0.217	-0.341	-0.177	—				
	p	<0.001	<0.001	0.002	—				
5. Emotional	n	330	328	321	322	—			
	r	-0.743	-0.521	-0.543	0.208	—			
	p	<0.001	<0.001	<0.001	<0.001	—			
6. Physical role	n	335	332	325	329	332	—		
	r	-0.380	-0.370	-0.261	0.654	0.338	—		
	p	<0.001	<0.001	<0.001	<0.001	<0.001	—		
7. Emotional role	n	335	332	325	329	332	339	—	
	r	-0.529	-0.464	-0.423	0.398	0.536	0.609	—	
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	—	
8. Dx	n	340	337	330	329	334	339	339	—
	r	0.226	0.334	0.256	-0.118	-0.261	-0.146	-0.246	—
	p	<0.001	<0.001	<0.001	0.032	<0.001	0.007	<0.001	—

Note. Depression, anxiety, stress assessed with DASS-21. Dx = number of diagnoses. All other domains assessed with the V/SF-36.

Table 2. Stress regression

Model		Unstandardised	Standard error	Standardised	t	p
M ₀	(Intercept)	11.759	1.534		7.666	<0.001*
	Age	-0.049	0.021	-0.130	-2.308	0.022*
	Race	0.779	0.569	0.076	1.368	0.172
	Sex	-0.266	0.626	-0.024	-0.424	0.672
	Diagnoses	1.179	0.276	0.235	4.263	<0.001*
M ₁	(Intercept)	18.329	1.561		11.740	<0.001*
	Age	-0.023	0.019	-0.063	-1.215	0.225
	Race	0.878	0.484	0.086	1.813	0.071
	Sex	-0.422	0.530	-0.038	-0.795	0.427
	Diagnoses	0.473	0.243	0.094	1.947	0.052
	Physical	-0.007	0.011	-0.036	-0.572	0.568
	Emotional	-0.118	0.015	-0.448	-7.844	<0.001*
	P Role	7.624×10 ⁻⁴	0.012	.005	0.064	0.949
	E Role	-0.025	0.012	-0.138	-2.104	0.036*

Note. Physical, emotional, P Role, and E Role were measured from the V/SF-36 (emotional wellbeing, physical wellbeing, role limitations due to physical difficulties, role limitations due to emotional difficulties). * = $p < 0.05$.

Table 3. Depression regression

Model		Unstandardised	Standard error	Standardised	t	p
M ₀	(Intercept)	10.400	1.770		5.874	<0.001*
	Age	-0.031	0.024	-0.073	-1.289	0.198
	Race	0.868	0.649	0.074	1.338	0.182
	Sex	-0.421	0.718	-0.033	-0.586	0.558
	Diagnoses	1.160	0.313	0.204	3.700	<0.001*
M ₁	(Intercept)	20.395	1.420		14.365	<0.001*
	Age	0.012	0.017	0.027	0.668	0.505
	Race	1.155	0.436	0.099	2.649	0.008*
	Sex	-0.633	0.480	-0.050	-1.317	0.189
	Diagnoses	0.037	0.218	0.006	0.168	0.867
	Physical	0.006	0.010	0.028	0.571	0.569
	Emotional	-0.196	0.014	-0.652	-14.452	<0.001*
	P Role	-0.016	0.011	-0.087	-1.534	0.126
	E Role	-0.027	0.011	-0.131	-2.520	0.012*

Note. Physical, emotional, P Role, and E Role were measured from the V/SF-36 (emotional wellbeing, physical wellbeing, role limitations due to physical difficulties, role limitations due to emotional difficulties). * = $p < 0.05$.

Table 4. Anxiety regression

Model		Unstandardised	Standard error	Standardised	t	p
M ₀	(Intercept)	5.930	1.642		3.611	<0.001*
	Age	-0.013	0.022	-0.033	-0.596	0.552
	Race	0.791	0.602	0.071	1.314	0.190
	Sex	0.010	0.672	7.890×10 ⁻⁴	0.014	0.989
	Diagnoses	1.667	0.291	0.307	5.726	<0.001*
M ₁	(Intercept)	15.003	1.659		9.043	<0.001*
	Age	-0.007	0.020	-0.016	-0.323	0.747
	Race	0.829	0.511	0.075	1.621	0.106
	Sex	-0.146	0.568	-0.012	-0.256	0.798
	Diagnoses	0.878	0.256	0.162	3.424	<0.001*
	Physical	-0.037	0.012	-0.187	-3.059	0.002*
	Emotional	-0.102	0.016	-0.357	-6.399	<0.001*
	P Role	-0.003	0.013	-0.015	-0.218	0.828
	E Role	-0.027	0.013	-0.133	-2.062	0.040*

Note. Physical, emotional, P Role, and E Role were measured from the V/SF-36 (emotional wellbeing, physical wellbeing, role limitations due to physical difficulties, role limitations due to emotional difficulties). * = $p < 0.05$.

Hierarchical regressions

Stress

In step 1 of the hierarchical regression analyses for stress ($n = 309$), demographic variables were entered. These variables were age, dichotomised race, sex and number of psychiatric diagnoses. The first step was significant, $F(4, 304) = 6.54$, $p < 0.001$, Adjusted $R^2 = 0.07$. Adding physical and emotional wellbeing and limitations due to physical and emotional difficulties improved the overall model, $\Delta F(4, 300) = 31.19$, $p < 0.001$, $\Delta R^2 = 0.27$. After adding these four variables in step two, greater emotional wellbeing and fewer limitations due to emotional difficulties were associated with reduced stress. Full coefficients for these regression models are presented in Table 2.

Depressive symptoms

In step 1 of the hierarchical regression analyses for depressive symptoms ($n = 318$), demographic variables were entered. These variables were age, dichotomised race, sex and number of psychiatric diagnoses. The initial step was significant, $F(4, 313) = 4.41$, $p = 0.002$, Adjusted $R^2 = 0.04$. Adding physical and emotional wellbeing and limitations due to physical and emotional difficulties improved the overall model, $\Delta F(4, 309) = 97.73$, $p < 0.001$, $\Delta R^2 = 0.53$. After adding these four variables, greater emotional wellbeing and less impairment

due to emotional difficulties were associated with reduced depressive symptoms. Overall, results were consistent with the stress model. Full coefficients for depressive symptoms regression models are presented in Table 3.

Anxiety

In step 1 of the hierarchical regression analyses for anxiety ($n = 317$), demographic variables were entered. These variables were age, dichotomised race, sex and number of psychiatric diagnoses. The initial step was significant, $F(4, 312) = 8.87$, $p < 0.001$, Adjusted $R^2 = 0.09$. Adding physical and emotional wellbeing and limitations due to physical and emotional difficulties improved the overall model, $\Delta F(4, 308) = 32.40$, $p < 0.001$, $\Delta R^2 = 0.27$. After adding these four variables, greater emotional wellbeing, better physical wellbeing and fewer limitations due to emotional difficulties were associated with reduced anxiety. Results are consistent with depressive symptoms and stress, except that physical wellbeing was also a distinct correlate. The results for these regression models are presented in Table 4.

Path analysis

Based on results obtained from regression analyses, a path analysis examining relations between emotional wellbeing, physical wellbeing, role limitations due to

emotional difficulties, role limitations due to physical difficulties, depressive symptoms, anxiety and stress was modelled ($N = 344$ using full information maximum likelihood estimation for those with at least one data point). Emotional wellbeing and fewer limitations due to emotional difficulties were modelled to relate to stress and depressive symptoms. Emotional and physical wellbeing and fewer limitations due to emotional difficulties were modelled to relate to anxiety.

The model was an appropriate fit to the data (SRMR and RMSEA < 0.05). Standardised coefficients were significant ($ps < 0.01$) for emotional wellbeing (-0.46) and role problems due to emotional difficulties (-0.17) relating to stress, which was also the case for depressive symptoms when considering emotional wellbeing (-0.64) and role problems due to emotional difficulties (-0.19 ; $ps < 0.01$). Finally, for anxiety, emotional wellbeing (-0.39), role limitations due to emotional difficulties (-0.19), and physical wellbeing (-0.19) were significantly related to anxiety ($ps < 0.01$). Overall, results suggest that emotional wellbeing and role problems due to emotional difficulties are key, unique correlates of stress, depressive symptoms and anxiety. At the same time, physical wellbeing also distinctly relates to anxiety difficulties.

Discussion

The current study assessed unique relations between emotional wellbeing, physical wellbeing, role limitations due to emotional difficulties, role limitations due to physical difficulties, and depressive symptoms, anxiety and stress in a trauma-exposed veteran sample. Stress and physical health are robustly linked,²⁹ as are emotional and physical health in veterans.^{13,14} A comprehensive examination of physical and emotional wellbeing, and their unique relations with psychopathology when examined simultaneously, has yet to be tested. The current study suggests emotional wellbeing and role limitations due to emotional difficulties are consistently related to stress, depressive symptoms and anxiety. The pattern of results is similar for anxiety, except physical wellbeing was a unique correlate for this outcome. A path model integrating correlation and regression results was an appropriate fit and supported prior analyses. Findings highlight unique contributions of emotional wellbeing and role limitations due to emotional difficulties when these are considered variables simultaneously and, pending future studies, suggest these variables may drive distress relative to physical wellbeing and role limitations related to physical difficulties.

Results are consistent with prior studies reporting significant relations between emotional wellbeing and depressive symptoms.³⁰ V/SF-36 domains, specifically physical and emotional health, relate to the experience of stress.³¹ The current study expands these findings, suggesting that both emotional wellbeing and limitations resulting from these difficulties are important to consider when understanding correlates of psychological distress in veterans. Given the extensive research on the link between physical health and distress, it is important to incorporate a simultaneous study of emotional wellbeing domains.

Relations between emotional wellbeing and role limitations due to emotional difficulties were consistent across anxiety, and physical wellbeing was also a correlate of anxiety when considering these variables in the same model. Some DASS-21 anxiety subscale items measure physiological arousal ('I experienced trembling, e.g., in the hands'). Given connections between physical health and physiological arousal,¹⁷ it is possible that physical difficulties are indicative of higher allostatic load, which may exacerbate anxiety. Overall, the results provide unique insights into the relationship between quality-of-life indicators and stress, expanding our knowledge base in this area and providing important implications for screening and interventions in VAHCS.

Regarding potential interventions to target role limitations due to emotional difficulties, acceptance and commitment therapy (ACT)³² is a viable option. ACT considers values and valued behaviour that may be impacted by psychological distress, potentially aligning with items assessing role limitations due to emotional difficulties in the V/SF-36 (e.g., accomplishing less than one would like due to emotional difficulties). However, cognitive-behavioural interventions more broadly would be viable intervention options as they consider functional impairment. As the number of psychiatric diagnoses was consistently related to stress, depressive symptoms and anxiety in the initial step of regression models and each V/SF-36 domain in bivariate correlations, interventions may also consider comorbidity in service delivery. Example interventions designed with comorbidity in mind include the unified protocol for emotional disorders and transdiagnostic behaviour therapy, both of which have demonstrated utility in veterans.^{33,34}

Findings also have implications for mental health screening efforts with veterans, adding to the literature examining the utility of the V/SF-36 in VAHCS.²⁴ Veterans exposed to PTEs reporting worse

emotional wellbeing and limitations due to these difficulties may be more likely to endorse clinical symptoms of depression or heightened stress. Those with greater physical health difficulties are also likely to endorse higher levels of anxiety. The V/SF-36 has been established as an easy-to-administer tool²⁴ that can be used as a preliminary marker of psychopathology and distress. Incorporating the V/SF-36 into routine clinical care may enhance the value of screening for difficulties that could precipitate or co-occur with psychopathology.

There are limitations to note when interpreting these findings in the present research. Of course, as the data collected are cross-sectional, causal interpretations are not appropriate. Quasi-experimental study designs may be an appropriate next step to discern the unique effects of emotional wellbeing and role limitations due to emotional difficulties within predetermined groups. Future research may also engage in efforts to determine how these relations vary and interact across primary psychiatric diagnoses and co-occurring difficulties (e.g., substance use). Larger samples would enhance generalisability across veteran populations. As the path analysis was based on results from correlational and regression analyses, replications are necessary to test a priori path model hypotheses.

Conclusion

The current study investigated relations between emotional wellbeing, physical wellbeing, role limitations due to these difficulties, and psychological distress (i.e., depressive symptoms, stress, anxiety). Findings suggest that emotional wellbeing and limitations specific to emotional difficulties uniquely relate to elevated stress and depressive symptoms. Physical wellbeing should also be considered in veterans presenting with elevated anxiety pathology, which may be attributed to allostatic load connecting physical health to emotional health, resulting from prolonged PTE exposure. Overall, the results have implications for the knowledge base on the unique effects of wellbeing indicators on distress, as well as for screening and intervention efforts in VAHCS settings.

Conflicts of interest

None to disclose. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

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References

1. Kilpatrick DG, Resnick HS, Milanak ME, Miller MW, Keyes KM, Friedman MJ. National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *Journal of Traumatic Stress*. 2013;26(5):537-547. <https://doi.org/10.1002/jts.21848>
2. Kessler RC, Aguilar-Gaxiola S, Alonso J, Benjet C, Bromet EJ, Cardoso G., et al. Trauma and PTSD in the WHO World Mental Health Surveys. *European Journal of Psychotraumatology*. 2017;8(sup5):1353383. <https://doi.org/10.1080/20008198.2017.1353383>
3. Kapfhammer HP. Acute and long-term mental and physical sequelae in the aftermath of traumatic exposure—some remarks on “The Body Keeps the Score”. *Psychiatria Danubina*. 2018;30(3):254-272.
4. Bonanno GA, Mancini AD. Beyond resilience and PTSD: Mapping the heterogeneity of responses to potential trauma. *Psychological Trauma: Theory, Research, Practice, and Policy*. 2012;4(1):74-83. <https://doi.org/10.1037/a0017829>
5. Gates MA, Holowka DW, Vasterling JJ, Keane TM, Marx BP, Rosen RC. Posttraumatic stress disorder in veterans and military personnel: Epidemiology, screening, and case recognition. *Psychological Services*. 2012;9(4):361. <https://doi.org/10.1037/a0027649>
6. Hoge CW, Warner CH. Estimating PTSD prevalence in US veterans: Considering combat exposure, PTSD checklist cutpoints, and DSM-5. *Journal of Clinical Psychiatry*. 2014;75(12):e1439-e1441. <https://doi.org/10.4088/JCP.14com09616>

7. Fletcher S, Elklit A, Shevlin M, Armour C. Predictors of PTSD treatment response trajectories in a sample of childhood sexual abuse survivors: The roles of social support, coping, and PTSD symptom clusters. *Journal of Interpersonal Violence*. 2021;36(3-4):1283-1307. <https://doi.org/10.1177/0886260517741212>
8. Iljazi A, Ashina H, Al-Khazali HM, Lipton RB, Ashina M, Schytz HW, Ashina S. Post-traumatic stress disorder after traumatic brain injury-a systematic review and meta-analysis. *Neurological sciences*. 2020;41:2737-2746. <https://doi.org/10.1007/s10072-020-04458-7>
9. Keyes KM, McLaughlin KA, Demmer RT, Cerdá M, Koenen KC, Uddin M, Galea S. Potentially traumatic events and the risk of six physical health conditions in a population-based sample. *Depression and Anxiety*. 2013;30(5):451-460. <https://doi.org/10.1002/da.22090>
10. O'Toole BI, Catts SV. Trauma, PTSD, and physical health: An epidemiological study of Australian Vietnam veterans. *Journal of Psychosomatic Research*. 2008;64(1):33-40. <https://doi.org/10.1016/j.psychores.2007.07.006>
11. Norman SB, Tate SR, McQuaid JR, Brown SA. Chronic health problems among alcohol and substance dependent veterans with and without trauma history. *Alcoholism-Clinical and Experimental Research*. 2006;30(6):207A.
12. Thomas MM, Harpaz-Rotem I, Tsai J, Southwick SM, Pietrzak RH. Mental and physical health conditions in US combat veterans: Results from the National Health and Resilience in Veterans Study. *The Primary Care Companion for CNS Disorders*. 2017;19(3):27474. <https://doi.org/10.4088/PCC.17m02118>
13. Oster C, Morello A, Venning A, Redpath P, Lawn S. The health and wellbeing needs of veterans: A rapid review. *BMC Psychiatry*. 2017;17:1-14. <https://doi.org/10.1186/s12888-017-1547-0>
14. Serier KN, Vogt D, Pandey S, Smith BN. Analysis of the bidirectional relationships between posttraumatic stress and depression symptoms with physical health functioning in post-9/11 veteran men and women deployed to a war zone. *Journal of Psychosomatic Research*. 2022;162:111034. <https://doi.org/10.1016/j.jpsychores.2022.111034>
15. Reyes-Vélez J, Buchanan E, Pavlacic J, Sweet J, Garland Baird L. An application of the biopsychosocial model for pain in Canadian Veterans Life After Service Studies 2019 survey. *Journal of Military, Veteran and Family Health*. 2024;10(1):30-39. <https://doi.org/10.3138/jmvfh-2023-0025>
16. Schnurr PP. Understanding pathways from traumatic exposure to physical health. In: Schnyder U, Cloître M. (Eds.). *Evidence based treatments for trauma-related psychological disorders*. Springer; 2022. https://doi.org/10.1007/978-3-030-97802-0_5
17. Schnurr PP, Hayes AF, Lunney CA, McFall M, Uddo M. Longitudinal analysis of the relationship between symptoms and quality of life in veterans treated for posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*. 2006;74(4):707-713. <https://doi.org/10.1037/0022-006X.74.4.707>
18. Shiner B, Watts BV, Pomerantz A, Young-Xu Y, Schnurr PP. Sensitivity of the SF-36 to PTSD symptom change in veterans. *Journal of Traumatic Stress*. 2011;24(1):111-115. <https://doi.org/10.1002/jts.20613>
19. Elliott TE, Renier CM, Palcher JA. Chronic pain, depression, and quality of life: Correlations and predictive value of the SF-36. *Pain Medicine*. 2003;4(4):331-339. <https://doi.org/10.1111/j.1526-4637.2003.03040.x>
20. Park CL, Sacco SJ, Kraus SW, Mazure CM, Hoff RA. Influences of religiousness/spirituality on mental and physical health in OEF/OIF/OND military veterans varies by sex and race/ethnicity. *Journal of Psychiatric Research*. 2021;138:15-23. <https://doi.org/10.1016/j.psychires.2021.03.034>
21. Gros DF, Milanak ME, Brady KT, Back SE. Frequency and severity of comorbid mood and anxiety disorders in prescription opioid dependence. *The American Journal on Addictions*. 2013;22(3):261-265. <https://doi.org/10.1111/j.1521-0391.2012.12008.x>
22. Brown TA, Barlow DH. *Anxiety and related disorders interview schedule for DSM-5 (ADIS-5)-adult and lifetime version: Clinician manual*. Oxford University Press; 2014.
23. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*. 1995;33(3):335-343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)

24. Jones D, Kazis L, Lee A, Rogers W, Skinner K, Cassar L, Wilson N, Hendricks A. Health status assessments using the Veterans SF-12 and SF-36: Methods for evaluating outcomes in the Veterans Health Administration. *The Journal of Ambulatory Care Management*. 2001;24(3):68-86.
25. Kazis LE, Lee A, Spiro III A, Rogers W, Ren XS, Miller DR, et al. Measurement comparisons of the medical outcomes study and Veterans SF-36® Health Survey. *Health Care Financing Review*. 2004;25(4):43.
26. Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990;107:238-246.
27. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*. 1999;6:1-55. <https://doi.org/10.1080/10705519909540118>
28. Steiger JH. A note on multiple sample extensions of the RMSEA fit index. *Structural Equation Modeling*. 1998;5:411-419.
29. Boardman JD. Stress and physical health: The role of neighborhoods as mediating and moderating mechanisms. *Social Science & Medicine*. 2004;58(12):2473-2483. <https://doi.org/10.1016/j.socscimed.2003.09.029>
30. Friedman B, Heisel M, Delavan R. Validity of the SF-36 five-item mental health index for major depression in functionally impaired, community-dwelling elderly patients. *Journal of the American Geriatrics Society*. 2005;53(11):1978-1985. <https://doi.org/10.1111/j.1532-5415.2005.00469.x>
31. Yang X, Ge C, Hu B, Chi T, Wang L. Relationship between quality of life and occupational stress among teachers. *Public Health*. 2009;123(11):750-755. <https://doi.org/10.1016/j.puhe.2009.09.018>
32. Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*. 2006;44(1):1-25. <https://doi.org/10.1016/j.brat.2005.06.006>
33. Gros DF. Development and initial evaluation of Transdiagnostic Behavior Therapy (TBT) for veterans with affective disorders. *Psychiatry Research*. 2014;220(1-2):275-282. <https://doi.org/10.1016/j.psychres.2014.08.018>
34. Varkovitzky RL, Sherrill AM, Reger GM. Effectiveness of the unified protocol for transdiagnostic treatment of emotional disorders among veterans with posttraumatic stress disorder: A pilot study. *Behavior Modification*. 2018;42(2):210-230. <https://doi.org/10.1177/0145445517724539>