An Examination of Chronic Pain Indices and the Updated Posttraumatic Stress Disorder Checklist for Diagnostic and Statistical Manual of Mental-Disorders-Fifth Edition

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ABSTRACT

Introduction:

Chronic pain and post-traumatic stress disorder (PTSD) comorbidity is prevalent among veterans and is associated with increased levels of pain severity and pain-related disability. An improved understanding of the relationship between these co-occurring disorders, in addition to effective integrated treatments, will develop by considering the changes to the PTSD diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). The current study examined the relationship between the revised PTSD Checklist for DSM-5 (PCL-5) symptom clusters (i.e., intrusion, avoidance, negative alterations in cognition and mood [NACM], and arousal) and chronic pain measurements (i.e., pain severity, interference, and disability).

Materials and Methods:

Participants included 103 veterans (ages 26-70, mean = 45.33) participating in a randomized clinical trial examining the efficacy of an interdisciplinary pain management program for chronic musculoskeletal pain. The study was approved by a university system Institutional Review Board and affiliated healthcare system.

Results:

The participants with a provisional PTSD diagnosis based on PCL-5 responses ($N = 76$) had significantly greater pain severity, interference, and disability than the participants without a provisional diagnosis ($N = 23$). Correlations between symptom clusters and pain measurements were mostly significant and positive with varying strengths. The avoidance symptom cluster, however, had relatively weaker correlations with pain measurements and was not significantly associated with the numeric rating scale of pain severity. Path analyses revealed that, after controlling for avoidance symptoms, significant associations remained between NACM and all the pain measurements. After controlling for NACM symptoms, however, there were no significant associations between avoidance symptoms and pain measurements.

Conclusion:

The current study highlights a need to re-examine the leading theories about the mutual maintenance of these disorders in order to develop effective integrative treatment approaches. PTSD-related avoidance may have a relatively weaker role in co-occurring chronic pain than the other symptom clusters and may have a qualitatively different role than chronic pain–related avoidance. Future research should explore the relationship between the avoidance in PTSD and the avoidance in chronic pain as well as identify which chronic pain measurements are the most useful when examining the relationship between PTSD and chronic pain. The potential impact of trauma-related cognition and mood on chronic pain indicates that this is an important area for intervention and should be considered in the development of integrated treatments for chronic pain and PTSD among veterans.

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There is a growing interest in research aimed at better understanding the relationship between chronic pain and mental health conditions such as post-traumatic stress disorder (PTSD). Chronic pain and PTSD symptoms co-occur frequently among veterans,[1] and patients with both the conditions exhibit more severe symptoms, worse prognosis and treatment outcomes, and greater levels of pain-related disability.[2–4] Post-traumatic stress disorder is best understood as a multidimensional construct[5,6] and its symptoms can be disaggregated into symptom clusters to allow for a more detailed understanding of the chronic pain and PTSD comorbidity. Nevertheless, changes to the PTSD diagnostic criteria are ever evolving in order to improve the diagnostic precision that could lead to a better treatment. The PTSD Checklist for DSM-5 (PCL-5)[7] is considered to be a gold-standard screening and assessment tool for PTSD and is often used in making a provisional PTSD diagnosis and for monitoring the symptom change. Because of the high frequency of PCL-5 use, any information about how PCL-5 scores and symptom clusters relate to pain mechanisms and possible tailored treatments would have a large impact on managing the significant number of patients with comorbid chronic pain and PTSD.

The most recent iteration of the PTSD diagnostic criteria in the "Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition" (DSM-5)[8] foregoes the previously accepted three-factor solution (e.g., re-experiencing, arousal, and avoidance/numbing) for an expanded four-factor solution that adds a dimension for negative alterations of cognition and mood (NACM, i.e., re-experiencing, arousal, avoidance, and negative alterations of cognition and affect). This revision more accurately reflects the current evidence of the construct, supporting an improved model fit with four symptom clusters[6,9] but also leaves a critical gap in understanding how this new PTSD conceptualization should be understood within the context of chronic pain. For instance, clinicians and researchers previously understood chronic pain and PTSD comorbidity by considering avoidance/numbing as only one theoretical construct.[10,11] However, understanding the comorbidity through that lens has not resulted in efficacious integrated treatments for chronic pain and PTSD.[11] One of the reasons why integrated treatments have failed may be due to a limited understanding of the role that the proposed mechanisms of change play in these co-occurring disorders. Without a current and cohesive model that incorporates PTSD symptom revisions into treatment conceptualization, effective treatments may continue to be out of reach. Examining the relationship between the updated PTSD diagnostic criteria and chronic pain variables may shed a new light on this vexing comorbidity that could illuminate new treatment pathways; interestingly, there are no extant studies that have done this.

The current study focuses on the changes in the cluster structure of PTSD from the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR)[12] to DSM-5. Prior work has supported the utility of examining the symptom clusters to predict the chronic pain outcomes, as opposed to the total PTSD symptom severity.[2,13,14] Cyders et al. found that subtle differences in the grouping of items that fall under the DSM-IV avoidance/numbing cluster resulted in different associations with the mechanisms related to chronic pain such as activity engagement.[13] The separation of the avoidance/numbing cluster into two distinct clusters is particularly salient because of the theoretical and treatment implications for chronic pain and PTSD comorbidity. Avoidance is a key factor in the maintenance of pain and PTSD and a hallmark clinical feature in each disorder on its own.[15] Identifying the differential influence of the PTSD symptom clusters could provide granular data on the relationship between PTSD and pain that could guide the novel treatment development. For example, if avoidance remains a predominant mechanism for pain and PTSD comorbidity under the new PTSD criteria, then treatments for pain and PTSD comorbidity should focus on the behavior change and exposure paradigms that directly challenge avoidance. If other clusters predominate, then alternative mechanisms of treatment may be needed.

RELATIONSHIPS BETWEEN PTSD AND PAIN VARIABLES

Chronic pain indices often include pain severity, pain interference, and pain-related disability. Pain severity is typically measured as either a single subjective rating of pain on a numerical scale (e.g., study by Katz et al.[14]) or a combination of several items related to pain experience and suffering associated with that pain (e.g., study by Moreno et al.[16]). Pain interference addresses the extent to which pain interferes with the responder's daily activities, and pain-related disability measures the functional impairment across different domains. Correlations between pain severity and DSM-IV PTSD symptoms range from 0.16 to 0.48 among veterans.[10,17–20] Similarly, significant correlations have been found between the PCL and pain interference (0.33-0.35)[10,18,19] and pain-related disability (0.25-0.58).[16,19,21] Additionally, veterans with PTSD have significantly greater pain severity, interference, and disability than those without PTSD.[4,10]

Only one study to date has examined PTSD by symptom cluster as it relates to chronic pain in veterans. Morasco et al. examined the DSM-IV symptom clusters and found that the arousal cluster had a stronger correlation with pain severity compared to other clusters and the avoidance/numbing symptom cluster had a stronger correlation with pain interference compared to other clusters.[10] Thus, treatments targeting pain intensity may benefit from components that address distress and arousal (e.g., relaxation and problem-solving), while those targeting function may benefit from exposure and behavior change paradigms that address avoidance. Given the significant revisions to the PTSD symptom cluster structure and the lack of research among the chronic pain and PTSD comorbidity among veteran populations with the PCL-5, research is needed to determine how these revisions may impact the relationship between PTSD clusters and chronic

pain. As more studies contribute to this literature, there is hope that improvements in diagnostic precision through the DSM-5 revisions to the PTSD criteria may lead to a more consistent research literature on pain and PTSD comorbidity that can consistently guide new directions in treatment.

PRESENT STUDY

The present study uses data from an existing pain and PTSD comorbidity clinical trial to address two aims. The first aim is to examine the relationship between the revised PCL-5 symptom clusters and chronic pain measurements (i.e., pain severity, interference, and disability) in a sample of veterans with chronic musculoskeletal pain to determine how the revisions in PTSD symptom clusters might offer new insights into the nature of pain-PTSD comorbidity. We hypothesize (1) that all four PCL-5 symptom clusters will have statistically significant relationships with pain severity, pain interference, and pain-related disability, such that increases in the pain measurements will be associated with the increases in each of the symptom clusters. We chose to use the numeric rating scale in addition to the pain severity subscale of the West-Haven Yale Multidimensional Pain Inventory (WHYMPI),[22] because each are commonly used in clinical and research settings. Revision of the PTSD diagnostic criteria has implications of the phenotype for patients who will and will not meet the threshold criteria for syndromal PTSD using the PCL-5. As a result, we also plan to compare syndromal and sub-syndromal PTSD patients in our sample (based on the established criteria for PTSD diagnosis using the PCL-5) to determine if there are broad differences in pain associated with meeting the criteria for PTSD diagnosis. We hypothesized (2) that individuals with a provisional PTSD diagnosis would have significantly greater pain severity, interference, and disability, compared to those without a provisional PTSD diagnosis. The second aim focuses on the separation of the avoidance/numbing cluster and is designed to determine the unique associations between NACM and avoidance symptoms, and each chronic pain outcome. Because prior work shows that the separation of the DSM-IV avoidance/numbing cluster into two clusters yields significant relationships between each cluster and pain severity and pain-related disability,[13] we hypothesize (3) that both the DSM-5 avoidance cluster and the NACM cluster will have significant associations with pain severity, pain interference, and pain-related disability after accounting for each other.

METHODS

Participants

A total of 103 adult veterans (mean age = 45.33; SD = 9.93; range: 26-70; men = 81, 78.64%) were included in data analysis. The present study used the baseline data from a randomized clinical trial (RCT) examining the efficacy of an interdisciplinary intervention to treat musculoskeletal chronic pain among veterans in the post 9/11 and Gulf War eras. A total of 42 individuals (41.18%) were identified as Hispanic and 60 individuals identified as non-Hispanic (58.82%). Most veterans reported prior service in the U. S. Army (66; 64.71%) or Air Force (21; 20.59%) and completed one deployment (35; 43.75%). See Table I for full patient characterization information.

Procedure

Participants were assessed for inclusion in the RCT by trained research coordinators, and data fidelity was monitored by a team of professional study staff. Participants were eligible to participate in the RCT if they experienced chronic ($\geq$3 months) musculoskeletal pain with at least moderate pain-related disability ($\geq$20% on the Oswestry Disability Index) and comorbid PTSD symptoms (PCL-5 scores of $\geq$25) and/or depression symptoms (Patient Health Questionnaire-9 scores of $\geq$10). Inclusion criteria also included prior physical and/or

TABLE I. Demographic Variables

Variable			
Age (SD)	45.33 (9.93)	Military branch *n* (%)	
Range	26-70	Army	66 (64.71)
n	103	Air Force	21 (20.59)
Gender *n* (%)		Marines	8 (7.84)
Female	22 (21.36)	Navy	5 (4.90)
Male	81 (78.64)	Coast Guard	2 (1.96)
N	103	n	102
Race/ethnicity *n* (%)		Deployments *n* (%)	
White	64 (62.75)	1	35 (43.75)
Black or African American	21 (20.59)	2	19 (23.75)
Other	12 (11.76)	3	13 (16.25)
American Indian/Alaskan Native	2 (1.96)	4+	13 (16.25)
Asian	2 (1.96)	n	80
Native Hawaiian or other Pacific Islander	1 (0.98)		
n	102		

Total possible $N = 103$.

psychological traumatic experiences, English language abilities, and prior, but not current, opioid use. Participants were excluded if they endorsed psychosis or suicidal symptoms that had not been stabilized, had a moderate or severe traumatic brain injury, were participating in a treatment targeting their opioid use, were pregnant, or reported pain that was caused by circumstances unrelated to their military service.

Measures

Demographics

Demographics, including age, gender, race, and military information, were assessed.

Pain Severity

Pain severity was assessed using the WHYMPI[22] in two separate ways. First, a one-item numeric rating scale was used: "Rate the level of your pain at the present moment." Responses may range from 0 ("No pain") to 6 ("Very intense pain"). Second, the pain severity subscale of the WHYMPI was used, which included the one-item numeric rating scale, in addition to items asking how severe the pain has been over the past week, from 0 ("Not at all severe") to 6 ("Extremely Severe"), and how much the individual suffers because of pain, from 0 ("No suffering") to 6 ("Extreme Suffering"). An unweighted average was used for the pain severity subscale ($\alpha = 0.83$).

Pain Interference

The Patient-Reported Outcomes Measurement Information System-Pain Interference[23] is a 40-item scale used to determine the extent to which pain has impeded on an individual's self-reported engagement with social, cognitive, physical, emotional, and recreational activities within the past 7 days. Individuals rate their interference on a 5-point scale, and a total score is used for the analyses ($\alpha = 0.97$).

Pain-Related Disability

The Oswestry Disability Index (ODI)[24,25] is a 10-item patient-completed questionnaire prompting the individuals with low back pain to rate the extent to which their pain contributes to disability in 10 different life domains. Each domain has six possible responses ranging from 0 to 5, with higher numbers indicating greater disability in that domain. Each item was converted into a percentage of disability (i.e., responding with a "3" = 60%), and the average of these items was used for a final disability rating ($\alpha = 0.81$).

PTSD

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5)[7] was used to measure the PTSD symptoms. The PCL consists of 20 items corresponding to the current PTSD diagnostic criteria. Individuals are asked to indicate the extent to which they have been bothered by the symptoms in the past month on a rating scale from 0 ("Not at all") to 4 ("Extremely"). Higher scores indicate greater PTSD severity. A total score >31-33 is indicative of probable PTSD diagnosis.[26] Unweighted sums of items were used for PCL-5 total scores ($\alpha = 0.93$) and the symptom cluster scores: intrusion ($\alpha = 0.87$), avoidance ($\alpha = 0.82$), NACM ($\alpha = 0.84$), and hyperarousal ($\alpha = 0.78$).

Data Analysis Strategy

Hypothesis 1 was assessed by examining Pearson correlations between each PTSD symptom cluster and each pain variable. Hypothesis 2 was assessed using independent samples *t*-tests, whereby pain variables were examined across provisional PTSD diagnosis (yes/no). Those who were considered to have a provisional PTSD diagnosis endorsed a total PCL-5 score of at least 33, and endorsed "Moderately," "Quite a bit," or "Extremely" on one item each on the intrusive and avoidance cluster, and two items each on the NACM and arousal cluster. This response pattern is consistent with a DSM-5 diagnosis of PTSD.[27] Our third hypothesis was addressed through the use of path analysis,[28] whereby all four pain variables were considered the outcome variables, and the avoidance and NACM clusters were specified as independent variables. Robust maximum likelihood was used, and the variance of each independent variable was specified, allowing for the use of full-information maximum likelihood. Variables commonly associated with chronic pain and PTSD were examined to determine if they predicted missingness of the outcome variables, and none were significantly predictive. Therefore, missing data were considered missing at random.[29] SAS v9.4[30] was utilized to assess Hypotheses 1 and 2, and Mplus v8.2[31] was used to assess Hypothesis 3.

RESULTS

Descriptive Statistics

Veterans who participated in the study reported severe disability on average as measured by the ODI (mean = 46.27%; SD = 0.13%; range: 20%-84%), and pain numeric rating scale scores ranging from 0 to 6 (mean = 3.68; SD = 1.38). The pain severity subscale of the WHYMPI ranged from 0.67 to 6 with a mean of 4.08 (SD = 1.13). Pain interference scores averaged 146.59 (SD = 30.03), with scores ranging from 69 to 200. The PTSD symptom total scores (based on the PCL-5 total score) were also high (mean = 47.05; SD = 16.39; range: 0-76). See Table II for means and SDs of variables of interest.

PTSD Symptom Clusters and Pain

Correlation tests of Hypothesis 1 revealed that all four PTSD symptom clusters were significantly associated with all pain variables (e.g., the relationship between NACM and the numeric rating scale, $r[92] = 0.29$, $P \leq .01$), except for the avoidance cluster, which failed to reach a statistically significant correlation with numeric pain rating. Numeric pain

TABLE II. Correlations between Variables of Interest, Means, and Standard Deviations

Variable	1	2	3	4	5	6	7	8	9
1. PCL-5—total	-								
2. PCL-5—intrusive	0.86**	-							
3. PCL-5—avoidance	0.75**	0.63**	-						
4. PCL-5—negative	0.92**	0.69**	0.65**	-					
5. PCL-5—arousal	0.88**	0.65**	0.55**	0.74**	-				
6. Numeric rating scale	0.35**	0.33*	0.18	0.29*	0.40**	-			
7. Severity subscale	0.50**	0.45**	0.33*	0.45**	0.50**	0.86**	-		
8. Pain interference	0.66**	0.52**	0.53**	0.65**	0.60**	0.46**	0.65**	-	
9. Pain-related disability	0.47**	0.48**	0.31*	0.43**	0.40**	0.49**	0.54**	0.74**	-
Mean	47.05	11.09	15.43	5.35	14.96	3.68	4.08	146.84	0.46
SD	16.39	4.78	6.67	2.25	5.19	1.38	1.13	29.98	0.13
N	99	99	100	100	100	97	97	101	103

*$P \leq .01$; **$P \leq .001$

Abbreviation: PCL-5 = Posttraumatic Stress Disorder Checklist-5.

ratings demonstrated the weakest relationship among the four pain variables with all four PTSD symptom clusters, though the avoidance cluster demonstrated a low correlation of $r = 0.40$ for both the numeric rating scale and pain-related disability (i.e., ODI score). PTSD symptom clusters had the strongest associations with pain interference. See Table II for all correlations between symptom clusters and pain variables.

Comparing Pain Variables Across Provisional PTSD Diagnosis Status

Hypothesis 2 was partially confirmed. Approximately 77% of participants met our criteria for a provisional PTSD diagnosis, and those meeting a provisional PTSD diagnosis endorsed higher scores on the numeric rating scale compared to those who did not meet our criteria. The difference in numeric rating scale scores between the two groups was not statistically significant $t(91) = -1.70$, $P = .09$. Participants with a provisional PTSD diagnosis endorsed significantly higher levels of pain as assessed by the pain severity subscale of the WHYMPI, $t(91) = -3.18$, $P \leq .01$. Similarly, those with a provisional PTSD diagnosis endorsed significantly greater levels of pain interference, $t(96) = -6.47$, $P \leq .001$, and pain-related disability, $t(97) = -3.24$, $P \leq .01$. Table III contains means and SDs for all variables of interest across the provisional PTSD diagnosis.

Associations of the NACM and Avoidance Clusters with Pain Variables

Partially confirming Hypothesis 3, a greater PTSD symptom severity within the NACM cluster was significantly related to each pain-related outcome, controlling for symptoms of avoidance: numeric rating scale ($b = 0.059$, SE = 0.027, $P = .027$; $\beta = 0.29$); pain severity subscale ($b = 0.068$, SE = 0.023, $P = .002$; $\beta = 0.41$); pain interference ($b = 2.34$, SE = 0.480, $P \leq .001$; $\beta = 0.53$); and pain-related disability ($b = 0.008$, SE = 0.003, $P = .002$; $\beta = 0.40$). However, there were no significant relationships between the avoidance PTSD symptoms and the numeric rating scale ($b = 0.002$, SE = 0.083, $P = .976$; $\beta = .00$), pain severity subscale ($b = 0.035$, SE = 0.061, $P = .565$; $\beta = 0.07$), and pain-related disability ($b = 0.003$, SE = 0.007, $P = .640$; $\beta = 0.06$) measures. There was no statistically significant relationship between the avoidance symptoms and pain interference ($b = 2.45$, SE = 1.473, $P = .096$; $\beta = 0.19$).

TABLE III. Independent Samples *t*-tests across Provisional PTSD Diagnosis Groups

Variable	PTSD: m (SD; n)	No PTSD: m (SD; n)	T (df)	*P*
Numeric rating scale	3.87 (1.33; 71)	3.32 (1.36; 22)	−1.70 (91)	.092
Severity subscale	4.32 (0.98; 71)	3.53 (1.15; 22)	−3.18 (91)	.002
Pain interference	156.7 (23.38; 75)	118.8 (28.31; 23)	−6.47 (96)	<.0001
Pain-related disability	0.49 (0.12; 76)	0.40 (0.12; 23)	−3.24 (97)	.0016
PCL-5—total	53.84 (10.46; 76)	24.61 (11.73; 23)	−11.41 (97)	<.0001
PCL-5—intrusive	12.63 (3.99; 76)	6 (3.46; 23)	−7.18 (97)	<.0001
PCL-5—avoidance	6.20 (1.58; 76)	2.65 (2.01; 23)	−8.84 (97)	<.0001
PCL-5—negative	18.25 (4.32; 76)	6.78 (4.50; 23)	−11.05 (97)	<.0001
PCL-5—arousal	16.76 (3.65; 76)	9.17 (5.36; 23)	−7.78 (28)[a]	<.0001

[a]Satterwhaite correction used due to unequal variances.

Abbreviations: df = degrees of freedom; PCL = Posttraumatic Stress Disorder Checklist-5; PTSD = posttraumatic stress disorder.

DISCUSSION

The present results build on prior research by examining the associations between chronic pain measurements and PTSD symptoms using the revised PCL-5 questionnaire within a veteran population to capitalize on improved diagnostic precision of PTSD under these new criteria. Individuals with a provisional PTSD diagnosis based on PCL-5 score profiles endorsed higher pain severity (subscale), pain interference, and disability. The numeric rating scale was marginally higher among those with provisional PTSD. Consistent with our findings, Giummarra and colleagues[32] found smaller differences in pain intensity ratings compared to other pain measures (e.g., pain interference) between patients meeting the provisional DSM-IV PTSD criteria and those not meeting the criteria. Contrary to our expectations, the avoidance symptom cluster was not significantly correlated with the numeric pain rating scale. Avoidance also appeared to have relatively weaker correlations with the pain measurements than the other symptom clusters, with the exception of pain interference. Furthermore, compared to avoidance, NACM appears to have a stronger association with all chronic pain variables.

The Addition of the NACM Cluster

Arguably, the largest change between the PCL-IV and PCL-5 was the addition of a cluster that assesses the impact of trauma on cognitions and mood (i.e., NACM cluster). Previous studies have examined a four-factor model of PTSD symptoms based on DSM-IV criteria, but the current study is the first to examine the relationship between the NACM cluster and chronic pain indices. Importantly, three new items were added to the previous "numbing" cluster to assess for self-blaming thoughts; negative beliefs about the self, world, and others; and a range of negative feelings. The present results indicate that the NACM cluster has a stronger association with chronic pain than the avoidance cluster. It may be that these added items are more salient within a chronic pain population compared to the PTSD-related avoidance due to the added dimension of negative emotion. The NACM cluster may be capturing dysphoric effects of trauma-related avoidance (e.g., feeling disconnected from others) that affect pain pathways, which is convergent with a robust body of literature describing a strong influence of depression on pain.[33]

The Differential Role of Avoidance

The results of the current study are the first to examine the relationship between chronic pain and DSM-5 PTSD symptom clusters. Overall, the results indicate that PTSD symptom clusters are differentially related to chronic pain indices. It may be that the PTSD avoidance symptoms have a weaker relationship with chronic pain measurements than the other PTSD clusters within a chronic pain population. It is important to consider the behavioral function of avoidance within this comorbid population, as there are important differences in the clinical presentation between avoidance in chronic pain and avoidance in PTSD. For individuals with PTSD, the avoidance of internal and external reminders of traumatic events function as an effort to prevent the emotional distress that accompanies the memory of the traumatic event. Avoidance in the context of chronic pain is observed as the avoidance of physical activity, which is believed to result in increased pain that is perceived as harmful.[34,35] There is an emphasis on emotional avoidance in the former and physical pain avoidance in the latter. The way in which these two types of avoidance interact with each other within this comorbid population is yet to be determined. Moreover, there is a need to refine the proposed mechanisms for mutual maintenance of pain and PTSD over time. Sharp and Harvey emphasize that avoidance is a crucial point of intervention for these co-occurring disorders.[15] The current results suggest that targeting either trauma-related avoidance or pain-related avoidance will not necessarily have an effect on the other avoidance behavior, which may explain the failure of some treatments for comorbid pain and PTSD that focus on avoidance as a primary shared mechanism. The development of effective treatments is dependent on having a clear understanding of the context, impact, and function of avoidance.

Assessing Pain

The present work highlights what careful consideration should be taken by pain physicians and clinical psychologists when assessing the pain severity. The numeric pain rating scale is frequently used within the clinical settings to quickly gather information about pain severity.[36] Compared to other measures of pain, relatively weak correlations between the single-item numeric pain severity rating scale and the PTSD symptom clusters emerged. The present work showed only a 0.56 difference in mean numeric pain scores between the patients meeting the criteria for provisional PTSD diagnosis on the PCL-5 and those who did not, which is not a clinically meaningful difference.[37] It is important for clinicians to recognize that assessing pain severity using only the numeric rating scale is limited, especially when treating pain patients who present with the added complexity of PTSD (i.e., military veterans with chronic pain). The numeric pain rating does not assess how pain is affecting the veteran in their daily activities and social roles. A broader picture would include a pain severity measure that assesses the emotional and functional impact of pain. Different contexts may call for different methods of measuring pain severity, and understanding what is being captured will benefit clinicians and researchers when assessing the chronic pain and PTSD comorbidity.

Limitations and Future Directions

The current work points to multiple future inquiries related to the chronic pain and PTSD population, although limitations do exist. First, this study is a secondary analysis of data from an RCT of interdisciplinary pain management and the sample

size was not determined based on a power analysis for this study. A larger sample may have found a stronger relationship between some of our weaker variables (e.g., numeric pain rating and avoidance cluster scores), though the significance of many of our other findings suggest an adequate power for most of our questions. Our sample was comprised of U.S. veterans from the post-9/11 and Gulf War combat eras and were predominantly male, limiting the generalizability of these results to female veterans. Incorporating other eras of military personnel would allow for a better understanding and tailored treatments based on the age and era of combat service. Administering the Clinician-Administered PTSD Scale for DSM-5[38] should be included in future studies as well to establish the PTSD diagnosis. The cross-sectional design also precludes the ability to determine causality. Future studies should be designed to specifically determine how these symptom clusters, particularly avoidance and NACM, may play different roles across time. Moreover, the RCT was designed to recruit individuals with comorbid depression and/or PTSD symptoms. These results may be unique to individuals who endorse higher symptoms of depression, particularly considering the strong association between the NACM cluster and pain outcomes. However, because depression is highly comorbid with PTSD and chronic pain, the present sample may indeed be representative of the population at large. An important future direction is to enhance our understanding of how the PTSD-related avoidance and chronic–pain related avoidance interact with each other regarding the outcomes of interest (e.g., pain-related disability). Results would inform both the current and future interventions. Finally, a better understanding of the utility of different pain severity measurements in predicting the PTSD symptoms and symptom change is indicated, allowing more informed determinations of the best way to evaluate the treatment outcomes in this population.

CONCLUSION

The current study highlights the associations between PTSD symptom clusters and common chronic pain outcome variables among a veteran population with comorbid chronic pain and PTSD symptoms. The results are particularly salient with the revision of the PCL and the paucity of research using this measure with a comorbid chronic pain and provisional PTSD sample among veterans. The numeric rating scale had the weakest associations with the PTSD symptom clusters, overall. Veterans with a provisional PTSD diagnosis endorsed a higher pain severity on the pain severity subscale, marginally higher pain severity on the numeric rating scale, and higher pain interference and pain-related disability. Finally, the NACM cluster, compared to the avoidance cluster of PTSD, appeared to have stronger relationships with all pain-related outcomes. These results indicate a need to better understand the role of avoidance in this population as well as a need to develop treatment approaches that address the NACM symptoms.

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CONFLICT OF INTEREST STATEMENT

None declared.

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