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Associations Between International Trauma Questionnaire Complex Posttraumatic Stress Disorder Symptom Clusters and Moral Injury in a Sample of U.K. Treatment-Seeking Veterans: A Network Approach

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Objective: Complex posttraumatic stress disorder (CPTSD) and moral injury are receiving increasing empirical attention. The network approach offers a novel method to understand the association between such mental health constructs. ***Method:*** The present study investigated: (a) the network structure of CPTSD symptom clusters according to the International Trauma Questionnaire to determine centrality (i.e., the most influential symptom cluster) and (b) the network structure of CPTSD symptom clusters and moral injury symptoms according to the Moral Injury Outcome Scale to determine bridge symptoms (i.e., the symptoms linking comorbid presentation of CPTSD and moral injury) within a clinical sample of veterans. ***Results:*** *Emotional dysregulation*, *avoidance*, and *interpersonal difficulties* were found to be most central in the CPTSD network, and *interpersonal difficulties, negative self-concept,* and *emotional dysregulation* were found to be the strongest bridge symptoms in the CPTSD and moral injury network. ***Conclusions:*** The two networks suggest a key role of disturbance in self-organization symptoms in the presentation of CPTSD and its association with moral injury among treatment-seeking veterans. Despite the limitations of the present study, it offers an insightful starting point as the first network analysis study of CPTSD in treatment-seeking veterans as well as its association with moral injury. Implications in terms of points of intervention and further research are discussed.

Clinical Impact Statement
Veterans are at an increased risk of experiencing complex posttraumatic stress disorder (CPTSD) and moral injury due to the nature of the traumas they may face prior to and during military service. There remains little known about how symptoms of CPTSD and moral injury interact, an insight that is essential to enable the delivery of effective, appropriate care to alleviate psychological distress. This study aims to understand the association between symptoms of CPTSD and moral injury difficulties. It highlights certain symptoms that may prove to be useful target points for clinical intervention.

Keywords: military, veteran, complex PTSD, moral injury, network analysis

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The International Classification of Disease 11th version (ICD-11) has identified complex posttraumatic stress disorder (CPTSD) as a distinct disorder from posttraumatic stress disorder (PTSD; World Health Organization, 2018). CPTSD is characterized by the presence of PTSD (i.e., reexperiencing, avoidance, sense of ongoing threat) alongside symptoms in three "disturbances in self-organization" (DSO) clusters, namely emotion dysregulation, negative self-concept, and interpersonal difficulties. Compared to PTSD, CPTSD is associated with more comorbid psychological difficulties and greater functional impairment (e.g., Letica-Crepulja et al., 2020; Murphy et al., 2021). Accumulating evidence highlights the clinical utility of the novel CPTSD diagnosis and supports the distinction between PTSD and CPTSD (Brewin et al., 2017; Cloitre et al., 2013). Meta-analyses suggest that evidence-based PTSD interventions are less effective in resolving CPTSD symptoms (Coventry et al., 2020; Karatzias et al., 2017), and there remains a need to investigate treatments for this debilitating disorder.

Recent discussions have emphasized that conceptualizing posttraumatic difficulties using only fear conditioning models that focus on anxiety symptoms may overlook elements such as guilt and shame that arise and may drive chronic PTSD-related symptoms (Gray et al., 2012; Litz et al., 2009). Moral injury (MI) is conceptualized as the "lasting psychological, biological, spiritual, behavioural, and social impact" that can result following exposure to

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potentially morally injurious events (PMIEs; i.e., experiences or actions that can "transgress deeply held moral beliefs and expectations"; Litz et al., 2009, p. 697). PMIEs can be considered as relating to self-responsibility (e.g., failure to prevent harm, perpetrating harm) and other-responsibility (e.g., betrayal by others, witnessing harm done to others; Frankfurt et al., 2018; Jordan et al., 2017). It is posited that cognitive attributions of a PMIE may give rise to enduring moral emotions of shame, guilt, anxiety, and self-condemnation as well as perpetuating withdrawal behaviors (Jinkerson, 2016; Litz et al., 2009). Widening away from only a fear conditioning conceptualization, viewing MI as a "trauma subtype" based on predominant emotional states (e.g., guilt/shame vs. fear/anxiety) may prove valuable in informing appropriate psychological intervention (Griffin et al., 2019). Such a consideration for the complexity of human emotion—that is, that a single event may elicit both shame and anxiety—may also hold important implications for assessment and treatment when both CPTSD and MI are present.

Growing evidence demonstrates a link between experiencing PMIEs and greater PTSD symptomatology (Griffin et al., 2019; Jordan et al., 2017; Levi-Belz et al., 2020), an association seemingly mediated by moral emotions (Lancaster, 2018). Data revealed that about 57% of U.K. treatment-seeking veterans with probable CPTSD reported MI relating to self- and other-responsibility PMIEs (Currier et al., 2021). MI has also been identified in other traumatized populations such as refugees and survivors of childhood abuse (e.g., Hoffman et al., 2019; Roth et al., 2022). While the ICD-11 has described CPTSD as a set of difficulties that in theory can arise following any traumatic incident, CPTSD appears most strongly associated with greater exposure to interpersonal, invasive, and violent experiences (e.g., Palic et al., 2016). Evidence also suggests that the onset of DSO symptoms, distinguishing CPTSD from PTSD, is preceded by exposure to uncontrollable, chronic, and repeated interpersonal traumas, such as childhood maltreatment and sexual violence (Cloitre et al., 2014; Hyland et al., 2017; Maercker et al., 2013; Palic et al., 2016). Such data suggests likely overlapping features of CPTSD and MI, yet to be investigated.

Network analysis has gained increasing attention as a novel way to understand the dynamics of mental health difficulties and as an alternative to the disease model of psychopathology (McNally, 2016). The network approach views symptoms not as a reflection of a latent, underlying mental disorder but rather that dynamic interacting symptoms may give rise to the disorder. Network analysis has been used to explore the symptom structure of disorders such as PTSD and CPTSD (e.g., McBride et al., 2020; Ross et al., 2018). Others have compared the structure of CPTSD across nationally representative samples (Knefel et al., 2019). More recently, network analysis has also been used to explore interaction between disorders such as PTSD and depression or MI (Levi-Belz et al., 2020). No studies to date have examined the network structure of CPTSD and its association with MI among a clinical sample of veterans.

Current Study

This study aims to explore two networks using cross-sectional data from a clinical sample of U.K. veterans. The first will investigate the network structure and centrality of CPTSD symptom clusters (i.e., CPTSD network). The second will investigate the network structure and associations between CPTSD and MI, focusing on identifying *bridge nodes* (i.e., items of one network highly associated with items from another) and *bridge edges* (i.e., strong associations between items from two different networks; i.e., CPTSD–MI network).

Method

Participants and Procedure

The sample consists of treatment-seeking veterans defined as having attended at least one treatment appointment following an initial assessment. Data were collected, between August and October 2020, as part of a larger patient-needs survey conducted at a U.K. charity dedicated to supporting the mental health needs of veterans (Williamson et al., 2022). The study was approved by the charity's research department.

A sample was extracted from the charity's Patient Management System of veterans who had received support over a 1-year period and who agreed to be contacted for research purposes ($N = 5{,}735$). Of those, 20% ($n = 1{,}147$) were randomly selected and emailed a link to the online survey, distributed using Survey Monkey. Participants were made aware that participation was voluntary and would in no way impact the support offered by the charity.

Of those contacted, 158 were excluded due to an invalid email address. Of the remaining 989, 43.3% ($n = 428$) consented and completed the survey. Two samples were selected for the present study. Participants who met the criteria of CPTSD according to the International Trauma Questionnaire (ITQ; Cloitre et al., 2018) were selected to estimate the CPTSD network, yielding an effective sample of 222 veterans. A subsample of those within the effective sample who completed the MI Outcome Scale (MIOS; Litz et al., 2022) was selected to estimate the CPTSD–MI network, yielding a sample of 164 veterans. Criteria were applied to ensure the adequacy of each sample to conduct the relevant network analyses (see Epskamp & Fried, 2018; see the online supplemental materials).

Participant characteristics per network analysis are described in Table 1.

Measures

Participants provided basic sociodemographic (age, sex, relationship status, education level, and employment status) and military (military service, role during service, years served, rank before leaving military, number of deployments, and reason for leaving) information. They also completed a range of health self-report measures including the ITQ and MIOS.

International Trauma Questionnaire

The ITQ (Cloitre et al., 2018) is an 18-item measure of CPTSD symptoms in the past month. Items are scored on a five-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Six items assess the presence of PTSD symptoms of reexperiencing (2), avoidance (2), and sense of threat (2). Another six items assess the presence of DSO symptoms of emotion dysregulation (2), negative self-concept (2), and interpersonal difficulties (2). The remaining six items assess impairment caused by PTSD (3) and DSO (3) symptoms, separately. Probable CPTSD is indicated by a score of ≥ 2 on at least one of two symptoms of each PTSD and DSO symptom cluster,

Table 1
Participant Characteristics of Samples Per Network Analysis

Variable	CPTSD network analysis ($n = 222$)	CPTSD–MI network analysis ($n = 164$)
Age		
1 (<35)	24 (10.8%)	17 (10.4%)
2 (35–44)	42 (18.9%)	28 (17.1%)
3 (45–54)	74 (33.3%)	54 (32.9%)
4 (55+)	82 (36.9%)	65 (39.6%)
Sex		
1 (female)	7 (3.2%)	5 (3.0%)
2 (male)	215 (96.8%)	159 (97.0%)
Relationship status		
In a relationship	139 (62.6%)	101 (61.6%)
Not in a relationship	78 (35.1%)	59 (36.0%)
Education level[a]		
High	80 (36.0%)	59 (36.0%)
Low	137 (61.7%)	101 (61.6%)
Employment status		
Working	71 (32.0%)	49 (29.9%)
Retired	41 (18.5%)	27 (16.5%)
Not working	105 (47.3%)	85 (51.8%)
Military service		
Army	186 (83.8%)	139 (84.8%)
Royal Navy	25 (11.3%)	17 (10.4%)
Royal Air Force	11 (4.9%)	8 (4.8%)
Role during service		
Non-combat	9 (4.1%)	5 (3.0%)
Combat/combat support	209 (94.1%)	157 (95.7%)
Number of years served		
<4 years	10 (4.5%)	6 (3.7%)
4–9.9 years	88 (39.6%)	64 (39.0%)
10–15 years	50 (22.5%)	38 (23.2%)
15–20 years	28 (12.6%)	22 (13.4%)
20+ years	43 (19.4%)	33 (20.1%)
Rank before leaving service		
Officer	21 (9.5%)	17 (10.4%)
Other rank	199 (89.6%)	146 (89.0%)
Number of deployments		
0	10 (4.5%)	6 (3.7%)
1	97 (43.7%)	76 (46.3%)
2	64 (28.8%)	40 (24.4%)
3 or more	51 (23.0%)	42 (25.6%)
Reason for leaving		
Voluntary	118 (53.2%)	85 (51.8%)
Medical/non-voluntary	101 (45.5%)	77 (46.9%)

Note. CPTSD = complex posttraumatic stress disorder; MI = moral injury. Numbers may not total to sample size due to missing information.
[a] Low education reflects those who completed no formal qualifications/O Levels/GCSEs/NVQs Level 1–2, and high education reflected those who completed A Levels and/or above.

as well as one of the three items of PTSD- and DSO-related impairment. Scores were summed per symptom cluster.

Moral Injury Outcome Scale

The MIOS (Litz et al., 2022) is a 14-item measure of MI in the past month relating to an experience where an individual (a) did or failed to do something; (b) saw someone do or fail to do something; and/or (c) was directly impacted by someone doing or failing to do something, that went against their moral code or values. Items are scored on a five-point scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate greater disturbance of MI symptoms. The MIOS was developed through a multiphase psychometric process and ongoing studies are investigating its psychometric properties.

Data Analysis

Data analysis involved an estimation of (a) a CPTSD network consisting of six nodes representing CPTSD symptom clusters and (b) a CPTSD–MI network consisting of six nodes representing CPTSD symptom clusters and 14 nodes representing MIOS items (Table S1 in the online supplemental materials). All analyses were conducted using the R statistical environment.

Network Estimation and Visualization

Networks were estimated using the *bootnet* and *qgraph* R packages (Epskamp et al., 2012, 2018), using Gaussian Graphical Models (GGM) based on a polychoric correlation matrix where all nodes were treated as ordinal. Networks consist of *nodes* (i.e., symptoms), and *edges* (i.e., associations between symptoms). Using GGM, edges reflect regularized partial correlations (RPCs) between nodes while controlling for all other nodes in the estimated network. Edges are visually represented as lines between nodes, with thicker lines representing stronger associations while controlling for other pairwise associations.

GGM was regularized using an extended Bayesian information criterion graphical least absolute shrinkage and selection operator (glasso) algorithm to select the optimal regularization parameter, reduce spurious edges, and produce an estimated network including the strongest and most relevant edges (Friedman et al., 2008). A modified Fruchterman–Reingold algorithm (Fruchterman & Reingold, 1991) for weighted networks (Epskamp et al., 2012) was used, placing strongly correlated nodes closer together.

Network Parameters

Centrality is a measure of node importance in the context of other nodes in the network. The centrality of nodes in the estimated CPTSD network was identified using *qgraph* (Epskamp et al., 2012). Node strength, closeness, and betweenness centrality indices were calculated. Strength reflects how well a node is *directly* connected to other nodes; closeness reflects how well a node is *indirectly* connected to other nodes, and betweenness reflects the importance of a node in the *average* path between two other nodes in the estimated network. Nodes with greater centrality in an estimated network have greater centrality values.

Bridge centrality is a measure of the connectivity between two constructs, such as CPTSD and MI. Bridge centrality in the estimated CPTSD–MI network was identified using *networktools* R package (Jones, 2018). Bridge strength, closeness, betweenness, expected influence (1-step), and expected influence (2-step) were calculated. Bridge strength reflects how well a given node is *directly* connected to nodes of another construct; closeness reflects how well a node is *indirectly* connected to nodes of another construct; betweenness reflects the importance of a node in the *average* path between two other nodes that each belong to a different construct; bridge expected influence (BEI) (1-step) reflects how well a given node is *directly* connected to nodes of another construct, taking into account positive and negative edges; and BEI (2-step) reflects the same as BEI 1-step but additionally accounts for the *indirect* influence of the node through other nodes. Expected influence is more

appropriate when estimated networks contain both positive and negative edges (Robinaugh et al., 2016).

Network Accuracy and Stability

To explore network accuracy and stability, bootstrapping methods (2,000 iterations) were employed using *bootnet* R package (Epskamp et al., 2018). A nonparametric bootstrap using resampled data with replacement was run to estimate 95% confidence intervals (CIs) around edge weights. Smaller CIs suggest greater accuracy. A case-dropping bootstrap using subsampling without replacement was used to assess the stability of the order of the centrality index. If the correlation between the order of centrality indices before and after dropping cases remains high, centrality indices can be considered stable. The correlation stability coefficient (CS-coefficient) should be at least .25, and ideally more than .50 to be interpreted as stable (Epskamp et al., 2018). Bootstrapped difference tests were used to test for significant differences in edge weights and centrality indices.

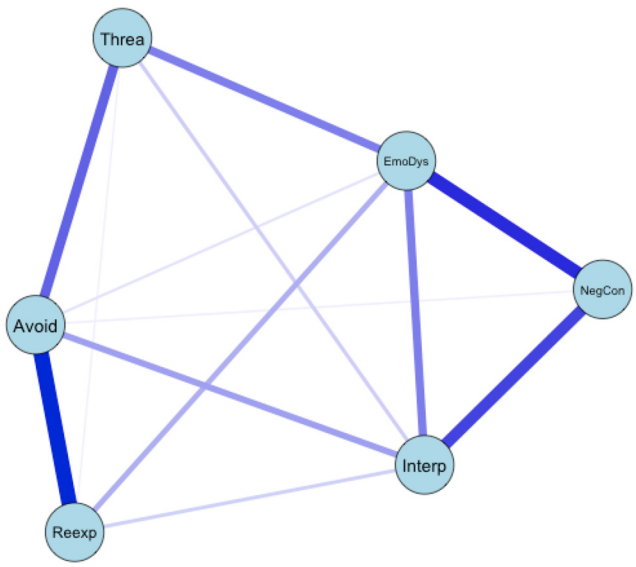
Results

CPTSD Network

The estimated CPTSD network is depicted in Figure 1. All nodes were positively connected, with the strongest edges found between *Reexp* and *Avoid*, RPC = .45; *EmoDys* and *NegCon*, RPC = .38; and *NegCon* and *Interp,* RPC = .33. The correlation matrix with all RPCs is presented in Table S2 in the online supplemental materials. Bootstrapped 95% CIs around edge weights (Figure S2 in the online supplemental materials) show a high overlap suggesting that many do not significantly differ from one another. However, the CI around the strongest edge did not overlap with about half of the other edges. The bootstrapped significance tests (Figure S3 in the online supplemental materials) revealed that the two strongest edges were significantly stronger than most of the other edge weights (except that *Reexp-Avoid* did not significantly differ from *Avoid-Threa,* and *EmoDys-NegConc* did not differ from *Avoid-Threa*, *EmoDys-Interp,* or *Threa-EmoDys*). The CS-coefficient was 0.52 for edge weights.

Figure 1

Regularized Partial Correlation Network of Complex Posttraumatic Stress Disorder (CPTSD) Symptom Clusters in a Sample of U.K. Treatment-Seeking Veterans



Note. See the online article for the color version of this figure.

Standardized centrality indices of each node are depicted in Figure 2. Results of the associated case-dropping subset bootstrap indicated node strength as the most stable centrality index (Figure S4 in the online supplemental materials). Centrality indices were moderately to highly correlated ($rs = 0.66$ for strength-closeness, 0.74 for strength-betweenness, and 0.97 for closeness-betweenness), thus strength was interpreted. Node centrality identified *Emodys* (1.21) as the most central, followed by *Avoid* (0.91) and *Interp* (0.44). These nodes did not significantly differ from each other (Figure S5 in the online supplemental materials). Except for a significant difference between *EmoDys* and *Reexp*, the strongest nodes did not differ from other nodes in the network. *Threa* was identified as the weakest node (Figure 2) but did not significantly differ from other nodes (Figure S5 in the online supplemental materials). The CS-coefficient for node strength was 0.21, falling below the minimum 0.25 of stability.

CPTSD–MI Network

The estimated CPTSD–MI network is depicted in Figure 3. Most nodes had positive edges. The strongest edges were found within-construct between *Reexp* and *Avoid*, RPC = 0.46; MIOS items *4* ("trouble seeing good in others") and *10* ("loss of trust in others"), RPC: 0.29, and *EmoDys* and *NegCon*, RPC = 0.25. The correlation matrix of all RPCs is presented in Table S3 in the online supplemental materials. While bootstrapped 95% CIs (Figure S6 in the online supplemental materials) show a high overlap of edge weights, bootstrapped significance tests (Figure S7 in the online supplemental materials) revealed that the strongest edge was significantly stronger than most other edges. The second and third strongest edges also significantly differed from several other edges. Relatively small correlations were found between MI and CPTSD nodes, RPCs: 0.01–0.20, with only a few significant differences (Figure S7 in the online supplemental materials). Node centrality is not presented due to a specific focus on the connections between CPTSD and MI.

BEI centrality indices of the CPTSD–MI network are depicted in Figure 4. Results of the associated case-dropping subset bootstrap suggest relative stability of BEI (Figure S8). BEI centrality identified *Interp* (0.60) and *NegCon* (0.36) as the most central (i.e., strongest bridge influence on MI). These nodes did not significantly differ from each other but were significantly stronger than most other nodes (Figure S9 in the online supplemental materials). The CS-coefficient of BEI was 0.28.

Discussion

The present study investigated the network structure of CPTSD and its association with MI. To our knowledge, this is the first network study examining the network structure of CPTSD and the network association with MI in a sample of veterans.

Figure 2

Centrality Indices of Each Symptom Cluster Node in the Complex Posttraumatic Stress Disorder (CPTSD) Network in a Sample of U.K. Treatment-Seeking Veterans

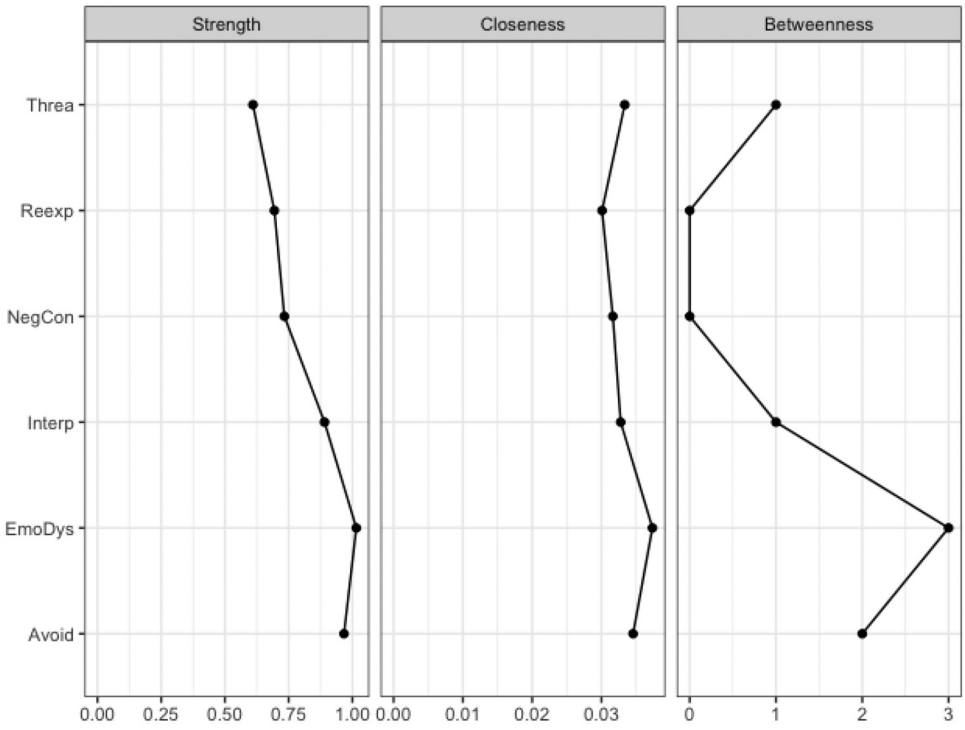
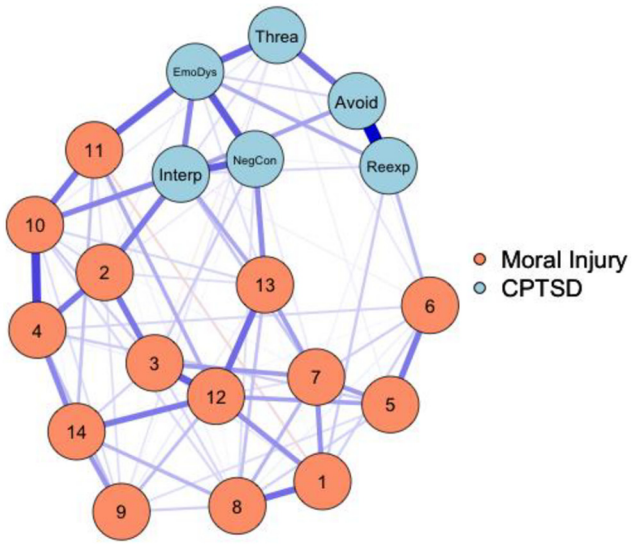


Figure 3

Regularized Partial Correlation Network of Complex Posttraumatic Stress Disorder (CPTSD) Symptom Clusters and Symptoms of Moral Injury in a Sample of U.K. Treatment-Seeking Veterans



Note. See the online article for the color version of this figure.

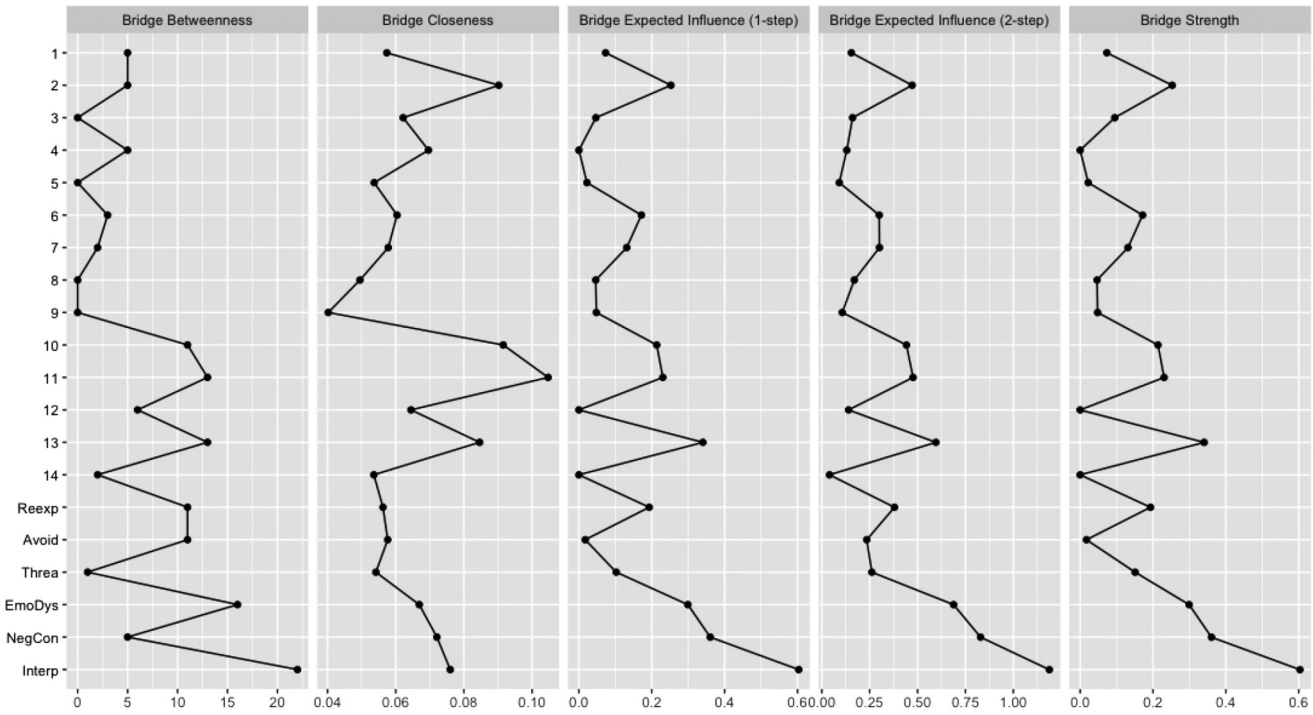
CPTSD Network

The CPTSD network identified the strongest associations between reexperiencing and avoidance, emotional dysregulation and negative self-concept, and negative self-concept and interpersonal difficulties. In line with previous research supporting the distinction between PTSD and DSO symptoms (e.g., Murphy et al., 2020), the associations were stronger within than between PTSD and DSO clusters. In line with previous research identifying negative self-concept and avoidance as the most central CPTSD symptoms across nationally representative samples (Knefel et al., 2019), avoidance was identified as highly central. However, emotion dysregulation was identified as the most central. While emotion dysregulation centrality did not significantly differ from other CPTSD symptom clusters (except for reexperiencing), its link with negative self-concept was significantly stronger than many other edges. Previous research has demonstrated an important role of emotional dysregulation in bridging DSO and PTSD symptoms (Knefel et al., 2019). Considering indications that symptom centrality may differ based on the type of traumatic event (Karatzias et al., 2020), it remains plausible that emotion dysregulation may play a more central role in the CPTSD network among veterans, specifically. Previous research has highlighted the importance of emotion dysregulation difficulties among veterans experiencing posttraumatic difficulties (Sippel et al., 2016).

Sense of current threat was identified as least central in the CPTSD network. Previous network studies of PTSD symptoms in veterans similarly did not find a central role of hypervigilance symptoms (e.g., Duek et al., 2021; Lazarov et al., 2020). Fear conditioning

Figure 4

Bridge Centrality Indices of Each Node in the Complex Posttraumatic Stress Disorder (CPTSD) and Moral Injury Network in a Sample of U.K. Treatment-Seeking Veterans



models posit that traumatic experiences establish neural fear networks that result in ongoing anxiety/fear symptoms (see Lissek & Grillon, 2012). While such a model has been crucial in driving forward an understanding of PTSD, it remains limited in offering insight into nonfear responses such as guilt and shame that may occur in isolation of, or alongside, fear-based responses. CPTSD is strongly associated with increased exposure to chronic and repeated traumas of an interpersonal nature (e.g. Cloitre et al., 2014; Hyland et al., 2017; Palic et al., 2016), where nonfear responses such as guilt, shame, and anger may play an important role. This is particularly relevant in the context that many veterans endure multiple adverse childhood events, which may lead to the onset of DSO difficulties (e.g., Cloitre et al., 2014; Hyland et al., 2017; Maercker et al., 2013; Palic et al., 2016). Moreover, the diminished role of the sense of current threat in the CPTSD network among veterans may potentially relate to the increased exposure to self- and other-responsibility nonthreat PMIEs (Currier et al., 2021).

CPTSD–MI Network

The CPTSD–MI network identified the strongest associations within than between CPTSD and MI. The strongest edges were observed between reexperiencing and avoidance of PTSD symptoms, trouble seeing the good in others and loss of trust in others MI difficulties, emotion dysregulation, and negative self-concept DSO symptoms. Interpersonal difficulties and negative self-concept had the strongest BEI centrality, suggesting they may play a particularly important role in linking CPTSD and MI. Previous research suggests that MI reactions may be dependent on contingencies of the PMIE (e.g., Bryan et al., 2016; Farnsworth et al., 2017). For example, emotions of guilt and shame may be more prominent in the context of PMIEs whereby an individual acts (or does not act) in a way that violates their values or morals, whereas anger, disgust, or contempt may be more prominent for those who witness others act (or fail to act) in a way that violates their values or morals. As many veterans are likely to have experienced traumas involving morally injurious elements of causing harm to others and witnessing others' atrocities (Currier et al., 2021), this consequently may result in negative self-views and difficulties in interacting with others.

In terms of MI difficulties with the strongest BEI, loss of pride in self, loss of faith in humanity, and being quick to anger were identified as most central (see Figure 4). One potential explanation may be that such MI reactions serve as a proxy for the violation of one's values or morals, creating a constant reminder of the PMIE that may activate and/or maintain CPTSD symptoms. This is in line with previous research among COVID-19 health and social care workers that identified self-criticism as an important moderator of the strength of association between PMIE and MI as well as CPTSD and MI (Zerach & Levi-Belz, 2022). Future investigation of the temporal precedence of MI, DSO, and PTSD symptoms is essential to better understand the directionality of such a potential dynamic interaction. An alternative explanation may be that changes in perception of self and others and emotion regulation difficulties reflect a conceptual overlap between MI and CPTSD, particularly DSO symptoms. Many veterans experiencing CPTSD also report MI and studies investigating MI as an outcome often emphasize disturbances in self-identity, relating to others, and emotional reactions, which also form core features of CPTSD (e.g., Brewin et al., 2017;

Cloitre et al., 2018; Currier et al. 2021). A recent study also demonstrated an MI to be more strongly associated with DSO than PTSD symptoms (Williamson et al., 2022). The distinction between DSO symptoms and MI remains an important empirical question for further studies.

Limitations

The current study has a few limitations requiring consideration. First, the sample size of the present study is relatively small compared to other population-level network analysis studies. Relatedly, there are some concerns regarding network stability, particularly regarding the CPTSD network. Despite no definitive guidance around inferring stability, bootstrapped CIs in the study were wide and CS-coefficients were below the recommended .50 (Epskamp et al., 2018). Many edge weights in the estimated networks did not differ from each other and interpretations of edges should be made with care. Replications employing larger samples are necessary to draw more conclusive inferences about the network of CPTSD and MI. Second, the study utilized cross-sectional data. While network analyses conducted using cross-sectional data may provide useful valuable insight into the relationship of variables in a network, it is limited in drawing causal inferences. It remains necessary for future studies to investigate directional relationships, for example, by examining the impact of emotion regulation improvements on other CPTSD symptoms. Finally, RPCs between MI and CPTSD in the present study were small. However, they reflect RPCs (i.e., shrunk).

Implications

The study has highlighted that DSO symptoms may play an important role in CPTSD and its association with MI. Should replication studies using larger samples offer further evidence of this, the findings would hold important clinical implications. Specifically, it would suggest that interventions targeting DSO symptoms may be beneficial in breaking the links within CPTSD and with MI. This is in line with an ongoing trial piloting a modular therapy developed to specifically address the key symptom clusters of CPTSD (ClinicalTrials.gov: NCT04752072). The current study suggests that particularly targeting emotion dysregulation may be essential, whereby an improvement in emotion regulation may support the alleviation of, for example, other CPTSD difficulties such as negative self-concept. At the research level, further investigation is essential to better understand the centrality of DSO symptoms in the CPTSD and CPTSD–MI networks. Future studies would be encouraged to utilize longitudinal data to gain insight into the dynamic interactions. Additionally, case-level network methodologies could help understand how targeting DSO symptoms, for example, emotional dysregulation, impacts the network of symptoms to identify components requiring secondary attention in treatment.

Conclusions

The present study is the first to examine the network of CPTSD as well as its network structure with MI among a clinical sample of veterans. In light of the findings suggesting that DSO symptoms may play a significant role in mediating this relationship, it could be helpful to explore whether interventions focusing on DSO symptoms may be effective in treating those presenting with CPTSD and MI. Further work is needed to better understand the dynamic interactions between symptoms and to investigate treatments for the debilitating mental health difficulties.

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