



Assessing posttraumatic stress related impairment and well-being: The Posttraumatic Stress Related Functioning Inventory (PRFI)



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ABSTRACT

Posttraumatic stress symptoms are associated with poorer social and occupational functioning and quality of life. However, general assessments of functioning do not determine the extent to which these difficulties are directly related to PTSD symptoms. This study examines the psychometric properties of a self-report measure, the 27-item Posttraumatic Stress Related Functioning Inventory (PRFI), which was developed to provide a self-report tool for clinicians and researchers to better understand the perceived impact of PTSD symptoms on functioning. The psychometric properties of the PRFI were examined utilizing data collected within a larger study examining quality of life and functioning in 251 veterans who had served in OEF/OIF/OND and endorsed the presence of subsyndromal or greater levels of PTSD symptoms at screening. One-year test-retest reliability of the measure was examined in a subset of the baseline sample who received a second administration of the PRFI ($n = 109$). Higher levels of PTSD symptoms were associated with poorer functioning in all domains. The PRFI demonstrated convergent validity with a measure of PTSD symptoms and was less correlated with measures of alcohol and drug use, good internal consistency and test-retest reliability from baseline to one-year follow-up. The PRFI provides self-report information regarding several domains of functioning. This initial examination of psychometric properties of the scale indicated that it may be useful for efficiently eliciting information about the ways in which PTSD symptoms in veterans impact everyday functioning.

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1. Introduction

Posttraumatic stress disorder (PTSD) has been highlighted as a signature wound of the conflicts in Afghanistan (Operation Enduring Freedom) and Iraq (Operation Iraqi Freedom; OIF; Operation New Dawn; OND), with rates of PTSD found to vary between 11% and 22% among veterans who served in these operations (Milliken et al., 2007; Seal et al., 2007). While a great deal of attention has been placed on the suffering associated with PTSD

symptoms, less emphasis has been given to the equally important impact these symptoms have on the daily lives of veterans, in particular on their capacity to thrive at work or school and to develop, maintain and enjoy personal relationships. Indeed, it is well-established that PTSD symptoms are linked to difficulties in functioning across a number of life domains, including social and occupational functioning (Larson and Norman, 2014; Jakupcak et al., 2008; Beckham et al., 1997; Thorp and Stein, 2005; Prigerson et al., 2001; Rodriguez et al., 2012; Schnurr et al., 2009). Results from the National Vietnam Veterans Readjustment Study (NVVRS) found that veterans with PTSD, compared with combat exposed veterans without PTSD, had more interpersonal difficulties, greater occupational instability, poorer physical health, and greater medical service utilization (Kulka et al., 1990). Further

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analyses with this sample found that PTSD predicted poorer outcome in physical health, employment, and diminished well-being, over and above comorbid psychiatric and other medical disorders (Zatzick et al., 1997). Other studies examining interpersonal relationships among veterans with PTSD reported worse family relationships (Koenen et al., 2008), difficulties in intimacy and communication, and higher rates of separation and divorce (Riggs et al., 1998; Cook et al., 2004).

Assessment of PTSD-related functioning has been recommended for improved PTSD diagnostic accuracy, treatment, and assessment of treatment outcome (Rodriguez et al., 2012). The direct relationship of PTSD symptoms to social and occupational functioning and general quality of life is clouded by other conditions that commonly co-occur in individuals with PTSD, such as depression and substance use disorders. Moreover, variation in functioning among those with PTSD symptoms has been observed, such that some individuals with relatively mild severity of PTSD symptoms report substantial functional difficulties (e.g., McLaughlin et al., 2015; Pietrzak et al., 2009) while others with high symptom levels have reported positive changes in psychological and functional outcomes (e.g., relationship closeness; see Linley and Joseph, 2004 for review). This lack of a perfect correspondence between level of PTSD symptoms and functional impairment suggests a need for more precise assessment and a deeper understanding of this relationship. Further, general assessments of functioning do not determine the extent to which functioning difficulties are directly related to PTSD symptoms. Unfortunately, this can lead to mistaken assumptions regarding the impact of PTSD, versus other factors or co-morbid conditions, on social and occupational functioning and leave unanswered the question about the degree to which difficulties in functioning or poor quality of life are attributable to PTSD symptoms.

We have developed a self-report measure, the Posttraumatic Stress Related Functioning Inventory (PRFI), to begin to address this gap in knowledge. This brief measure is intended to provide a means for those providing psychiatric and psychological care to patients with PTSD to better understand the perceived impact of symptoms on social and occupational functioning and quality of life (i.e., lifestyle) and to indicate points of intervention. For this study we examined the psychometric properties of the PRFI utilizing data collected within a larger study examining quality of life and functioning in 251 OEF/OIF/OND veterans with PTSD symptoms. We also examined one-year test-retest reliability of the measure in a subset of the baseline sample ($N = 109$) who received a second administration of the PRFI.

2. Materials and methods

2.1. Participants

Baseline. As noted previously, these data were collected as a component of a larger VA-funded study examining factors related to difficulties in functioning among veterans who served in OEF/OIF/OND. Participants were 251 male and female OEF/OIF/OND veterans who were initially screened using a PTSD self-report measure, the Posttraumatic Stress Checklist – Military (PCL-M) over the telephone and at the time of study entry met DSM-IV criteria for subthreshold (2 out of 3 symptom clusters) or full PTSD related to their military service. Participants deemed eligible and who expressed interest in participating were mailed a questionnaire booklet along with a self-addressed envelope and consent documents. Informed consent documents were reviewed with eligible participants following the telephone screening. Individuals were recruited using VA databases, media sources, and postings, see Maguen et al. (2013) for further details on the recruitment

strategy. Individuals ($n = 600$) were screened for eligibility, 261 were enrolled, and 251 completed the baseline survey.

Of 251 participants, the majority were male ($n = 212$, 84.5%), currently married or in a domestic partnership (50.6%), and the mean age was 34.1 ($SD = 9.7$). Women were oversampled through increased efforts to contact those who were identified as female in the VA databases. Of the current sample ($n = 248$), 6.9% ($n = 17$) reported no current annual income; 16.9% ($n = 42$) reported an annual income of under \$10,000; 33.5% ($n = 83$) reported between \$10,000 and \$25,000 annually; 23.0% ($n = 57$) reported earning between \$25,000 and \$50,000 annually; 19.7% ($n = 49$) reported earning more than \$50,000 annually. A minority of the sample was employed full-time (31.1%, $n = 78$) and a minority endorsed attending school (27.1%, $n = 68$).

See Table 1 for demographic and military characteristics. Institutional Review Board approval was received at the San Francisco VA Medical Center and the University of California, San Francisco.

Follow-up. Approximately one year following completion of the baseline survey, participants were re-contacted and invited to participate in a follow-up survey. Of those eligible to participate during the course of the study ($N = 184$), 109 (59%) completed the follow-up survey. The mean length of time from completion of the baseline survey to completion of the follow-up survey was an average of 403 days ($SD = 60.86$). The follow-up participants were significantly younger ($m = 32.4$, $SD = 9.2$) than those who did not participate in the follow-up survey ($m = 36.3$, $SD = 10.0$) ($t(249) = -3.220$, $p = .001$). There was no significant difference in gender ($\chi^2 = (1, n = 251) = 2.041$, $p = .153$), race/ethnicity ($\chi^2 = (1, n = 251) = .753$, $p = .386$), or PTSD symptoms ($t(249) = .053$, $p = .957$).

Table 1
Baseline demographic and military characteristics.

	N (%) ^a
Age (Mean and SD)	34.12 (9.7%)
Female Gender	39 (15.5%)
Education	
High School Diploma/GED	25 (10%)
Some College/Associates Degree	165 (65.7%)
College Graduate (BA/BS)	33 (13.1%)
Some Graduate School	7 (2.8%)
Post Graduate/Professional Degree	21 (8.4%)
Ethnicity	
Caucasian	155 (61.8%)
Hispanic/Latino	31 (12.4%)
Asian	15 (6.0%)
African-American/African	10 (4.0%)
Native American/Alaska Native	7 (2.8%)
Native Hawaiian/Pacific Islander	6 (2.4%)
Multi-racial/other	27 (10.8%)
Marital Status	
Currently Married	106 (42.2%)
Never Married	85 (33.9%)
Divorced (No Domestic Partner)	39 (15.5%)
Living with a Domestic Partner	21 (8.4%)
Military Branch	
Army	133 (54.3%)
Marines	59 (24.1%)
Navy	36 (14.7%)
Air Force	16 (6.5%)
Other	1 (0.4%)
Number of Deployments	
Not Deployed	1 (0.4%)
1 OEF/OIF/OND Deployment	118 (47.8%)
2 OEF/OIF/OND Deployments	76 (30.8%)
Greater than 2 Deployments	52 (21.0%)
Combat Exposure (DRRI-1, Mean and SD)	7.68 (4.24)
Perceived Threat (DRRI-1, Mean and SD)	52.15 (9.78)

^a n ranges from 245 to 251 due to small amounts of missing data.

2.2. Measures

Demographics collected at baseline included gender, age, ethnicity, education, and military service details. Measures of trauma exposure, current PTSD and co-morbid symptomatology, and functioning were administered.

PTSD Symptoms experienced in the past month were assessed using the Posttraumatic Stress Checklist-Military Version (PCL-M) (Weathers et al., 1991; Weathers et al., 1993; Blanchard et al., 1996). The PCL-M is a 17-item measure assessing military related PTSD symptoms in the past month. Symptoms are endorsed on a five-point Likert scale ranging from not at all to extremely and scores range from 17 to 85, with a suggested clinical cut-off score of 50 (Weathers et al., 1993). Mean total scale scores for this sample were 53.94 ($SD = 15.41$) at baseline and 49.50 ($SD = 17.44$) for the follow-up subsample.

Combat Exposure and Perceived Threat during deployment were assessed using two subscales drawn from the Deployment Risk and Resilience Inventory (DRRI) (King et al., 2003). The Combat Experiences subscale is composed of 15 items and assesses potentially traumatic experiences during deployment on a dichotomous scale. The mean number of combat experiences endorsed by this sample was 7.68 ($SD = 4.24$). The Deployment Process subscale was used to measure perceived threat and is composed of 15 items. This subscale is rated on a scale from 1 (strongly disagree) to 5 (strongly agree), and scores range from 15–75. The mean score on the Deployment Process subscale for this sample was 52.15 ($SD = 9.78$).

Depression symptoms were assessed using the Center for Epidemiologic Studies–Depressed Mood Scale (CES-D) (Radloff, 1987). The CES-D is a 20-item measure assessing depression symptoms during the past week. Items are rated as 0 (rarely or none of the time) to 3 (Most or all of the time) and scores range from 0 to 60, with a suggested clinical cut-off score of ≥ 16 (Radloff, 1977). The mean score for this sample at baseline was 27.34 ($SD = 13.14$).

Alcohol use in the past month was assessed using the Michigan Alcohol Screening Test (MAST) (Selzer et al., 1975). It is comprised of 25 items which are scored dichotomously (yes/no), yielding a range of scores from 0 to 25. A score of ≥ 7 was suggested to indicate alcohol problems (Selzer et al., 1975). The mean of the MAST scores for the baseline sample was 4.78 ($SD = 6.85$).

Drug use in the past month was assessed using the Drug Abuse Screening Test (DAST-10). It is a 10-item modified version of the 28-item original measure (Skinner, 1982) and has been found to have good psychometric properties (Yudko et al., 2007). Items are scored dichotomously (yes/no), yielding a range of scores from 0 to 10. A score of ≥ 5 has been suggested to indicate a moderate substance use problem and need for further assessment (Skinner, 1982). The mean of the DAST scores for the baseline sample was 2.0 ($SD = 1.89$).

General functioning during the past month was assessed using the World Health Organization Quality of Life (WHOQOL) – BREF (WHOQOL Group, 1998). Two domains of functioning were examined in this study: social (e.g., personal relationships, social support, and sexual activity) and environmental (e.g., financial resources, freedom, safety, home environment, opportunities for developing new skills). Items are endorsed on a continuous scale ranging from 1 to 5. Total scale scores range from 4 to 20 with higher scores indicating higher functioning. In this sample, mean baseline scores for each domain were: social (11.41, $SD = 3.96$); and environmental (13.0, $SD = 3.18$).

Posttraumatic Stress Related Functioning during the past month was assessed using the Posttraumatic Stress Related Functioning Inventory (PRFI). The PRFI was developed through an iterative process using subject matter experts (SMEs). Following review of

the literature, the items were initially developed by the first and second authors, who have extensive experience conducting clinical and research work with individuals with PTSD. Items were reviewed for face validity, content, wording, and formatting by other co-authors, study team members and clinicians experienced in the treatment of PTSD. Based on feedback and input from these SMEs, the measure was revised accordingly. Measure instructions briefly explained the purpose of the assessment: “The following questions ask how your symptoms have impacted your quality of life in the following areas: work or school, relationships, and quality of life,” and participants were asked to “Please choose the answer that best corresponds to each statement. We ask that you think about your life in the past 4 weeks when answering each question”.

The PRFI has 27 items and assesses functioning related to three domains: work and school; relationships; and lifestyle. Each domain is made up of two subscales: *Symptom Cluster Impact* which separately assesses the impact of re-experiencing, avoidance, numbing, and hyperarousal symptom clusters on each domain of functioning and *Total Symptom Impact* which includes items that address the functional impact of all four clusters of PTSD symptoms taken together. Items for the PRFI are scored on a five-point Likert scale from 0 (not at all) to 4 (extremely). Only the first 26 items are scored, item 27 provides a space for the individual to provide additional information about functional difficulties. Total scale scores range from 0 to 36 (work and school functioning), 0–36 (relationship functioning), and 0–32 (lifestyle), with higher scores indicating worse functioning in the respective domain. Symptom Cluster Impact subscale scores within each domain are derived by summing items: 1–4 (work and school functioning); 10–13 (relationship functioning); and 19–22 (lifestyle). Total Symptom Impact subscale scores within each domain are derived by summing items: 5–9 (work and school functioning); 14–18 (relationship functioning); and 23–26 (lifestyle).

2.3. Data analysis

One-way frequency tables for all variables and measures of central tendency and variability were computed to characterize the sample. Exploratory factor analyses of the PRFI items were then performed using iterated principal axis factoring with promax rotation to allow for correlated factors. Along with theory, Kaiser's eigenvalues-greater-than-one rule was used to guide selection of the number of factors to retain. Following factor analyses, subscales were subjected to internal consistency reliability analyses (Cronbach's coefficient alpha) for each subscale. PTSD, alcohol use, and drug use were used as measures of convergent and discriminant validity. Test-retest reliability was assessed by correlating the baseline and 12-month follow-up PRFI subscale scores. All analyses were performed with SPSS version 17.0.

3. Results

3.1. Demographic characteristics and functioning

See Tables 2 and 3 for PRFI baseline sample item and subscale means and standard deviations. Table 4 presents the relationships between demographic characteristics and PTSD-related functioning at baseline. Of note, more severe impact of PTSD symptoms on all functional domains, with the exception of two correlations that did not meet statistical significance (notably race/ethnicity with social relationships (SCI) and combat exposure with work/school (TSI)) was observed for those of non-Caucasian race/ethnicity and for those who reported greater combat exposure and higher perceived threat during deployment.

Table 2
Item characteristics for PRFI items at baseline and follow-up (Range for all items 0–4).

Abbreviated item	Baseline			Follow-up		
	n	Mean	SD	n	Mean	SD
Work and school functioning						
1. Impact of re-experiencing symptoms on work/school	249	1.60	1.36	108	1.55	1.30
2. Impact of avoidance symptoms on work/school	250	1.63	1.36	109	1.54	1.33
3. Impact of emotional numbing symptoms on work/school	249	1.97	1.44	109	1.92	1.39
4. Impact of hyperarousal symptoms on work/school	249	2.53	1.38	109	2.35	1.45
5. PTSD symptoms interfere with ability to find a job/succeed at courses/homework	251	1.74	1.48	109	1.63	1.54
6. PTSD symptoms interfere with ability to concentrate on job/courses/homework	250	2.01	1.38	109	1.97	1.44
7. PTSD symptoms cause consistent lateness or missed days at work or school	251	1.24	1.49	109	1.13	1.36
8. PTSD symptoms impact relationships with coworkers/boss/fellow students/teachers	251	1.66	1.39	109	1.76	1.43
9. PTSD symptoms make it difficult to pursue career goals	251	2.00	1.45	109	1.96	1.47
Relationship functioning						
10. Impact of re-experiencing symptoms on ability to form or maintain relationships	251	1.73	1.37	109	1.76	1.39
11. Impact of avoidance symptoms on ability to form or maintain relationships	251	1.71	1.39	109	1.80	1.34
12. Impact of emotional numbing symptoms on ability to form or maintain relationships	250	2.33	1.33	109	2.34	1.35
13. Impact of hyperarousal symptoms on ability to form or maintain relationships	251	2.35	1.38	109	2.06	1.44
14. PTSD symptoms interfere with ability to develop new relationships	249	2.23	1.32	109	2.19	1.32
15. PTSD symptoms interfere with ability to maintain long-lasting relationships	250	2.14	1.39	109	2.08	1.38
16. PTSD symptoms prevent deeper relationships	249	2.20	1.39	109	2.38	1.35
17. Relationships with family have suffered because of PTSD symptoms	251	2.19	1.34	109	2.17	1.40
18. PTSD symptoms interfere with ability to communicate well with others	251	2.16	1.32	109	2.11	1.36
Lifestyle						
19. Impact of re-experiencing symptoms on quality of life	250	1.93	1.35	109	1.91	1.33
20. Impact of avoidance symptoms on quality of life	249	1.85	1.40	109	1.91	1.37
21. Impact of emotional numbing symptoms on quality of life	249	2.23	1.30	108	2.15	1.34
22. Impact of hyperarousal symptoms on quality of life	250	2.57	1.35	109	2.42	1.36
23. PTSD symptoms interfere with ability to find/maintain stable housing	250	1.06	1.43	108	1.01	1.42
24. PTSD symptoms prevent engagement in enjoyable activities	248	2.00	1.40	109	1.92	1.33
25. PTSD symptoms prevent feelings of confidence in self	250	2.08	1.37	109	2.07	1.41
26. PTSD symptoms cause/have caused legal problems	250	.87	1.44	109	.61	1.23
27. List other area of interference with functioning						

Note. Item 27 is qualitative and not included in scoring; Symptom Cluster item stems are written as follows: 1) Re-experiencing items: Distressing thoughts, memories, or dreams of my military experience interfere with my ability to ...; 2) Avoidance symptoms: Trying to avoid thoughts, feelings, activities, or places that remind me of my stressful military experience interfere with my ability to ...; 3) Emotional numbing symptoms: Not being able to relate to or feeling detached from other people and my limited ability to feel things interfere with my ability to ...; 4) Hyperarousal symptoms: Difficulty falling or staying asleep, irritability/outbursts of anger, difficulty concentrating, and being on guard more than the average person interfere with my ability to ...

Table 3
PRFI baseline sample subscale means and Standard Deviation (SD).

PRFI subscale	Mean (SD)	Range
Work and School		
Symptom Cluster Impact	7.69 (4.85)	0–16
Total Symptom Impact	8.61 (6.17)	0–20
Relationships		
Symptom Cluster Impact	8.10 (4.83)	0–16
Total Symptom Impact	10.93 (6.05)	0–20
Lifestyle		
Symptom Cluster Impact	8.56 (4.77)	0–16
Total Symptom Impact	5.99 (4.47)	0–16

Note. n ranges from 247 to 250 because of small amounts of missing data.

Table 4
Correlations of demographic characteristics with the PRFI subscales at baseline.

Measure	PRFI	PRFI	PRFI	PRFI	PRFI	PRFI
	W/S	W/S	SR	SR	LS	LS
	SCI	TSI	SCI	TSI	SCI	TSI
Demographic Characteristics						
1. Age	.04	.00	.03	.07	.09	-.01
2. Gender	.07	.11	.01	.03	.01	-.02
3. Education	-.05	-.03	-.11	-.02	-.06	-.09
4. Non Caucasian Race/Ethnicity	.20**	.19**	.10	.15*	.16*	.21**
5. Number of deployments	.16*	.14*	.10	.11	.13*	.07
6. Combat exposure	.20**	.11	.18**	.15**	.22**	.13*
7. Perceived threat during combat	.42***	.40***	.41***	.39***	.47***	.39***

Note: * = $p < .05$; ** = $p < .01$; *** = $p < .001$; W/S = Work/School Functioning; SR = Social Relationships; LS = Lifestyle; SCI = Symptom Cluster Impact; TSI = Total Symptom Impact; N ranges from 241 to 251 because of small amounts of missing data.

3.2. Scale characteristics

The majority of the PRFI items were normally distributed (see Table 2). However, two items were positively skewed. These items were event-specific and perhaps less frequently occurring (i.e., legal problems and homelessness). This pattern of results was consistent across both the baseline and follow-up samples.

3.3. Factor analyses with the baseline sample ($n = 244$)

Preliminary exploratory factor analyses indicated that some specific symptom cluster items (the first four items) from each of

the three functioning domains consistently loaded separately from other more general functioning items (i.e., all symptoms taken together). Conceptually, it was determined that the items assessing the relationship of specific symptom clusters to general domains of functioning (e.g., occupational functioning) were different than the items which asked about the impact of the symptoms as a whole on specific aspects of functioning (e.g., difficulty finding a job). Consequently, the symptom cluster and the total symptom impact items were examined in two separate factor analyses, using iterated principal axis factoring. In the first factor analysis we investigated the structure of the 12 items that comprise the **Symptom Cluster Impact** subscale (items 1–4, 10–13, and 19–22). We found one factor with an eigenvalue of greater than one (Eigenvalue = 8.4) accounting for 70.09% of the variance. The symptom cluster-related items included in the analysis were all significantly inter-correlated, ranging from .52 to .85. In the second factor analysis we investigated the structure of the 14 items that comprise the **Total Symptom Impact** subscale (items 5–9, 14–18 and 23–26). We found two factors with eigenvalues greater than one, which together accounted for 69.45% of the variance ($r = .76$). A third factor was extracted which approached but did not reach an eigenvalue greater than one (.95). Two items from the quality of life/lifestyle domain loaded primarily on this factor: 1) PTSD symptoms interfere with ability to find or maintain stable housing, and 2) PTSD symptoms have caused legal problems for me. When interpreting the two-factor solution, the work/school subscale items and the relationship subscale items distinctly loaded on separate factors (utilizing a factor loading cut-off of .32) (Tabachnick and Fidell, 2000). It does not appear that the quality of life/lifestyle items favored either scale. Table 5 presents the factor loadings for the two-factor solution. These findings were replicated with little variation in the follow-up sample.

3.4. Reliability analyses

The standardized coefficient alpha for the PRFI specific symptom impact and general symptom impact for each of the three domains at baseline were as follows: (1) **Work and School Scale** (items 1–9, $n = 246$), $\alpha = .94$; *Symptom Cluster Impact on work and school* = (items 1–4, $n = 247$), $\alpha = .90$, *Total Symptom Impact on work and school* = (items 5–9, $n = 250$), $\alpha = .91$; (2) **Social Relationships Scale** (items 10–18, $n = 247$), $\alpha = .96$; *Symptom Cluster Impact on social relationships* = (items 10–13, $n = 250$), $\alpha = .91$, *Total Symptom Impact on social relationships* = (items 14–18, $n = 248$),

$\alpha = .94$; and (3) **Lifestyle Scale** (items 19–26, $n = 246$), $\alpha = .91$; *Symptom Cluster Impact on lifestyle* = (items 19–22, $n = 248$), $\alpha = .91$, *Total Symptom Impact on lifestyle* = (items 23–26, $n = 248$), $\alpha = .80$ (this alpha value may be lower because of the diversity and relative infrequency of the lifestyle items (e.g., legal problems, housing problems etc.)).

Bivariate correlations with symptom measures were conducted to examine convergent and discriminant validity (see Table 6). PRFI scores were highly correlated with total PTSD symptom scores ranging from .70 to .83. PRFI scores were less correlated with alcohol use (ranging from $r = .22$ to .37) and drug use (ranging from $r = .23$ to .30). Additionally, PTSD and depression symptoms were positively correlated in this sample ($r = .76$, $p = .000$) and approximately 77% of the sample met a cut-off for at least a mild level of depression on the CES-D.

Temporal Stability. In the subsample of veterans who completed the follow-up assessment, the test-retest correlation coefficients for all of the subscales ranged from .71 to .75, indicating very good temporal stability over an approximately one year period.

3.5. Comparing associations of PRFI and WHOQOL-BREF scores with current PTSD symptoms

Lower functioning scores on the 6 PRFI subscales were moderately correlated with lower functioning on the WHO-QOL-BREF measures of functioning, ranging from $-.34$ to $-.60$. Associations between the WHOQOL-BREF subscales and PTSD total and subscale scores were lower than the associations of the PRFI subscales and PTSD symptoms but also significant ($p < .001$) and ranged from $r = -.26$ to $-.49$. Comparing the lowest correlation between the PRFI and the PCL-M total score with that of the highest correlation between the WHOQOL-BREF and PCL-M total score found that the PRFI was significantly more related to PCL-M total scores (Steiger's $Z = 4.615$, $p < .001$; Steiger, 1980).

Partial Correlations of Depression and Alcohol Use with Functioning. Controlling for PTSD symptom severity ($n = 232$), correlations of the PRFI subscales with depression symptoms were significant, ranging from $r = .17$ ($p = .008$) to .39 ($p = .000$). Correlations of the PRFI subscales with alcohol use were significant only for two PRFI subscales after controlling for PTSD symptom severity: Relationship Functioning, Total Symptom Impact ($r = .16$, $p = .016$) and Lifestyle, Total Symptom Impact ($r = .29$, $p = .000$). Correlations of the WHOQOL-BREF subscales, after accounting for PTSD symptoms, were significant with both depression and alcohol

Table 5
Two-factor solution for the Posttraumatic Stress Related Functioning Inventory – Total Symptom Impact items (PRFI) ($N = 244$).

Item	1 Eigenvalue = 8.67 (61.89%)	2 Eigenvalue = 1.06 (7.60%)
5. Taken together, these symptoms interfere with my ability to find a job (or my courses/homework)	.13	.74
6. Taken together, these symptoms interfere with my ability to concentrate on my job (or my courses/homework)	.18	.69
7. Taken together, these symptoms cause me to be consistently late or miss days at work (or school)	-.20	.92
8. Taken together, these symptoms impact my relationship with coworkers and/or boss (or fellow students or teachers)	.21	.61
9. Taken together, these symptoms have made it difficult to pursue my career goals	.18	.69
14. Taken together, these symptoms interfere with my ability to develop relationships with new people	.86	.03
15. Taken together, these symptoms interfere with my ability to maintain long-lasting relationships	.98	-.06
16. Taken together, these symptoms prevent me from having deeper relationships	.88	-.01
17. Taken together, my relationships with family (including spouse/partner and children if applicable) have suffered because of those symptoms	.77	.06
18. Taken together, these symptoms interfere with my ability to communicate well with others.	.79	.08
23. Taken together, these symptoms interfere with my ability to find or maintain stable housing	.14	.59
24. Taken together, these symptoms prevent me from engaging in enjoyable activities (e.g., working out, sports, listening to music, hobbies, etc.)	.54	.29
25. Taken together, these symptoms prevent me from feeling confident about myself	.55	.26
26. Taken together, these symptoms have caused legal problems for me (e.g., drunk driving charges)	.17	.34

The bolded numbers indicate the factor for which the item had the highest loading.

Table 6
Correlations of PRFI baseline subscale scores with symptom and WHOQOL-BREF subscale scores ($n = 247–250$).

PRFI subscale	PCL-M	Depression symptoms	Alcohol use	Drug use	WHOQOL-BREF social	WHOQOL-BREF environmental
Work and School						
Symptom Cluster Impact	.77	.65	.24	.30	-.34	-.44
Total Symptom Impact	.70	.69	.22	.29	-.41	-.52
Relationships						
Symptom Cluster Impact	.79	.72	.25	.24	-.46	-.48
Total Symptom Impact	.74	.71	.29	.29	-.53	-.51
Lifestyle						
Symptom Cluster Impact	.83	.77	.27	.23	-.44	-.47
Total Symptom Impact	.71	.71	.37	.33	-.50	-.60

Note. All correlations were $p < .001$ level. Higher scores on PRFI indicate greater functional impairment; Lower scores on the WHOQOL-BREF indicate lower functioning.

use. WHOQOL-Bref subscale, Social Functioning, was correlated with depression symptoms at $r = -.41$ ($p = .000$) and with alcohol use at $r = -.14$ ($p = .035$); Environmental Functioning was correlated with depression symptoms at $r = -.32$ ($p = .000$) and alcohol use at $r = -.22$ ($p = .001$).

4. Discussion

This study introduced and conducted an initial examination of the psychometric properties of a new self-report assessment of functional impairment related to posttraumatic stress symptoms. Overall, these initial findings indicate that the PRFI has acceptable validity and reliability, and has promising utility as a measure of PTSD-related impairment. In general, the veterans who participated in this study had been exposed to significant levels of combat, experienced symptoms of depression, alcohol and drug use in addition to PTSD symptoms, and endorsed a range of functional impact of symptoms. Overall, veterans endorsing more severe symptoms of PTSD also endorsed greater functional impact of these symptoms on all measures. Of the demographic characteristics, being of a non-Caucasian race or ethnicity was related to more difficulties in aspects of all functional domains. Among non-Caucasians, greater functioning difficulties were found for a given level of PTSD symptom severity, suggesting that symptoms are exacting a greater toll on functioning. Ethnocultural factors may influence the ways in which symptoms are manifested and ways of coping, as well as reporting of symptoms and symptom impact. These factors should be examined more closely in future studies. Moreover, combat-related variables such as number of deployments, combat exposure, and perceived threat, were related to functioning outcomes – with perceived threat being the most strongly related to all functional domains on the PRFI. This is consistent with previous findings that perception of threat may be a more powerful predictor of future mental health consequences than merely trauma exposure itself (McCaslin et al., 2006).

Preliminary analyses indicated that PRFI items were best represented by two subscales for each functioning domain. The Total Symptom Impact items performed as expected, reflecting the presence of separate factors for social relationship functioning and occupational/academic functioning. The lifestyle/quality of life items loaded on both the relationship and occupational scales, and on a third factor. As these items are not intended to capture a single domain (but rather broadly touch upon multiple items indicative of quality of life) and the items are often tied to items on the other two scales (e.g., homelessness and occupational functioning), this is understandable.

One might expect PTSD symptoms and function to be more tightly correlated when using a PTSD-specific functioning measure versus a general functioning measure. Generally, these results indicate that the PRFI has greater specificity with regards to measuring the relationship of PTSD symptoms to functioning than a

more general measure of functioning, indicating that it may be more sensitive to the impact of PTSD, specifically, on functional outcome. As might be expected, the PRFI was more highly related to PTSD symptoms ($r = .70$ to $.83$) than to measures of alcohol ($r = .22$ to $.37$) and drug use ($r = .23$ to $.33$). Although correlations with symptom measures other than PTSD are reduced when accounting for PTSD symptoms, overlap between PTSD, depression, and alcohol use symptoms continues to be captured to some extent by the PRFI. This may be due to the item overlap in criterion symptoms between the psychiatric diagnoses. For example, “trouble falling or staying asleep” (PCL-M) and “my sleep was restless” (CES-D) ($r = .72$, $p = .000$). The similarity in items leads to an inherent confounding of the data.

The overlap in PTSD and depression symptoms is similar to that found in another study of post-911 veterans that examined PTSD and functioning (Larson and Norman, 2014). In that study, depression symptoms were excluded from the analyses because of this high level of multicollinearity. Use of interview measures may aid in the discrimination of PTSD and depression symptoms. Additionally, further examination of this measure in individuals with PTSD who do not endorse significant co-morbid depression symptoms versus those with high co-morbidity is needed. The PRFI demonstrated good internal consistency and test-retest reliability. The test-retest correlations ($r = .71$ to $.74$) indicate relatively stable functioning within approximately a twelve month period. Stability over a twelve month period of time for quality of life has been found in a previous study of PTSD symptoms and quality of life in Vietnam veterans (Schnurr et al., 2006). Although no overall significant change was found in quality of life, the authors noted that there was significant change within individual participants which was related to the change in PTSD symptoms during the same period of time.

While the ideal scenario for assessing functioning would include a comprehensive assessment, this is not always feasible given time or client/participant burden constraints. The PRFI is a tool which can provide relevant and important information regarding the level of perceived interference the individual is experiencing in multiple domains of his or her life. It allows the individual to tie this to PTSD symptoms in a direct and concrete manner. Symptoms are specified within the measure, providing targeted direction for the individual to refer to when completing the items. This information can indicate points for intervention, which the clinician can follow-up on, or it can indicate the need for deeper assessment into specific domains. For example, if symptoms appear to be disproportionately impacting one specific area of functioning (e.g., relationships), more attention can be placed on this area during the course of treatment. Indeed, a previous examination of associations between functioning and PTSD symptom clusters, following a course of Cognitive Processing Therapy, found that change in emotional numbing symptoms were associated with relationship functioning and that hyperarousal symptoms were related to daily living

(Shnaider et al., 2014). Exploratory analyses within the current study sample appear to indicate that some symptom clusters may have more impact in certain functional domains. For example, avoidance symptoms were rated as having significantly more impact within the lifestyle domain when compared with the other two domains ($m = 2.85, p = .000$), whereas numbing symptoms were rated more impactful within the social relationships ($m = 3.33, p = .000$) and lifestyle domains ($m = 3.23, p = .000$) versus work/school ($m = 2.96, p = .000$). Further, hyperarousal symptoms rated as most impactful within the work/school ($m = 3.53, p = .000$) and lifestyle domains ($m = 3.57, p = .000$), when compared to social relationships ($m = 3.35, p < .002$, and $p = .000$, respectively). Reliable and valid self-assessment instruments which can be administered quickly can be useful first line measures, which can then be followed up with a diagnostic interview. They can also be useful for assessing changes over time in symptoms and functioning. This type of measure can be delivered via different self-report modalities such as online, requiring fewer resources and less time. Given the current early state of measure development of the PRFI, individuals should be given some instructions by a trained professional or rater and provided the opportunity to request clarification of the items if needed.

Future work development of the PRFI should include conducting qualitative work to determine if the instrument can be transitioned for use as a stand-alone self-report instrument or if it may be best used primarily as a clinician-administered instrument.

This study had a number of limitations. Primarily, the measure was used in a larger ongoing study examining PTSD-related functional difficulties and quality of life. Assessment of PTSD-related functional impairment in this study is limited to self-report by the individual and contains no additional scales assessing validity of reporting (e.g., over-reporting of symptoms, malingering). Kaye et al. (2014) reported an association of higher scores on validity items with higher scores on self-report measures of PTSD, depression, and disability among 73 women with PTSD. Based on their findings, the authors concluded that it was unclear whether the high scores on the validity scale were evidence of greater subjective distress or actual over-reporting of symptoms, as those with higher scores on the validity scales also had higher severity scores on clinician administered measures as well as measures that were considered more objective (e.g., cognitive testing). Regardless, these findings emphasize the importance of including multiple types of measures, specifically those that are performance-based, to provide the broadest picture of the relationship of symptoms to disability.

Whenever possible, it is ideal to collect clinical interview data and information from others familiar with the individual such as friends and family to provide a more comprehensive picture of current and past functioning (Rodriguez et al., 2012). This may be particularly important when examining samples which endorse both PTSD and depression symptoms, in order to improve diagnostic specificity. As mentioned in the previous paragraph, this study would have benefitted from the inclusion of more objective or performance-based measures of functioning, such as neuropsychiatric testing or measures requesting specific quantifiable information about functioning (e.g., how often one engages in social activities, the number of days unable to work because of symptoms). Indeed, Kaye et al. (2014) reported no relationship between self-reported PTSD symptoms and functioning and more objective measures (e.g., cognitive testing, functional capacity [i.e., performance of everyday tasks related to communication and finances such as counting change and making an emergency call]). They also found that lifetime vocational attainment was not associated with self-reported PTSD and depression symptoms, or self-reported disability, but was associated with the more objective

measures of functional capacity and cognition. In our current study, we did not measure lifetime vocational attainment but current income, employment status, and school enrollment were collected as part of the larger study. In this sample, income level was not associated with PTSD symptoms, but was associated with self-reported functioning. Specifically, income level was associated with environmental functioning ($r = .288, p = .000$) but not social functioning. Full-time employment was negatively associated with PTSD scores ($r = -.141, p = .025$) and positively associated with environmental functioning ($r = .189, p = .003$) but not social functioning. Enrollment in school was negatively associated with PTSD symptoms ($r = -.173, p = .006$) and positively associated with environmental ($r = .154, p = .014$) and social ($r = .209, p = .001$) functioning. These relationships may differ from those in the aforementioned study in part because we asked participants to answer for the current timeframe as opposed to lifetime. In sum, future studies examining the validity and utility of this measure should include assessments that provide measurable objective outcomes that can be compared and contrasted with this subjective self-report measure.

Future qualitative studies focused on participant perception of the measure (e.g., ease of readability of the DSM-consistent item stems) has potential to yield valuable information for future measure refinement. The items included in this measure are based on the DSM diagnostic criteria for PTSD. Therefore, the extent to which this measure captures other cultural interpretations or psychological manifestations of trauma and related reporting of the impact of these on psychosocial functioning is limited (Hinton and Lewis-Fernandez, 2010). This measure as studied was consistent with DSM-IV criteria; with the release of DSM-5, the measure will be revised and further examined.

The PTSD measure used in this study, the PCL-M, is limited in that it requests information related to military experiences; thus, it may miss symptoms related to nonmilitary experiences. It may also miss deployment-related exacerbations of PTSD symptoms, if the original inciting trauma is not military-related. Finally, this sample is limited to veterans who endorsed a high level of PTSD comorbidities and should be examined in other populations, such as civilians, to assess generalizability and the potential impact of comorbidities on measure psychometrics and generalizability.

While a comprehensive assessment, obtaining information from multiple sources and using multiple methods, is most desirable, the self-report measure introduced in this study provides key subjective information regarding several domains of functioning. This scale can be used in a rapid, time-efficient fashion to elicit useful information indicating the ways in which the client's experience of PTSD symptoms impacts daily functioning.

Contributors

Drs. McCaslin and Maguen co-authored the PRFI measure. Dr. McCaslin designed the study. Drs. Marmar and Neylan provided key feedback and consulted on both the measure development and the research study. Ms. Bosch managed the study data. Drs. McCaslin, Maguen, and Mr. Metzler undertook statistical analyses. Dr. McCaslin wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

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Conflicts of interest

Dr. Neylan has received research medications from Actelion and Glaxo Smith Kline for studies funded by the Department of Defense and Department of Veterans Affairs and has consulted for Genentech. None of the other authors have any conflicts of interest to disclose.

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