Distress Overtolerance among Firefighters: Associations with Posttraumatic Stress

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Abstract

Firefighters experience heightened rates of posttraumatic stress disorder (PTSD) symptoms compared to the general population. Nascent literature has identified distress overtolerance (DO; i.e., the tendency to persist through extremely high levels of distress despite harmful consequences) as a construct of potential relevance to PTSD symptomatology, though empirical research is lacking.

Objective: The present study examined incremental associations between DO subscales (Capacity for Harm: persevering through distress despite its effect on one's wellbeing; Fear of Negative Evaluation: persisting through distress due to a fear of being negatively evaluated by others should they quit) and PTSD symptom severity and symptom cluster severity (i.e., intrusion, avoidance, negative alterations in cognitions and mood [NACM], arousal and reactivity) among firefighters.

Method: Participants included 282 trauma-exposed firefighters (91.8% male, $M_{age} = 40.4$, $SD = 9.6$). Covariates included years in the fire service, trauma load (i.e., number of trauma exposure types), and negative affect.

Results: Results indicated that Capacity for Harm was a significant incremental correlate of total PTSD symptom severity ($R^2 = 0.045$, $p = 0.004$), NACM symptoms ($R^2 = 0.061$, $p < 0.001$), and arousal/reactivity symptoms ($R^2 = 0.047$, $p = 0.005$). Fear of Negative Evaluation was not significantly related to any criterion variables.

Conclusion: Further work examining DO-PTSD relations is necessary to inform intervention and policy for the fire service.

Keywords

distress overtolerance; PTSD; trauma; firefighters

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Introduction

An estimated 91.5% of firefighters report exposure to traumatic events, yet the prevalence of posttraumatic stress disorder (PTSD) among firefighters is variable (9% to 33%) given the dearth of epidemiological data on this population (Meyer et al., 2012). Thus, it is important to identify potential factors related to risk or maintenance of PTSD symptoms among this population. Developing literature has explored malleable cognitive-affective transdiagnostic factors among firefighters that may inform specialized intervention development (Vujanovic & Tran, 2021). However, we are not aware of any published research that has examined distress overtolerance (DO) in the context of PTSD among firefighters.

Distress overtolerance (DO) is defined as an individual's tendency to persist through distressing situations, despite the negative consequences they may experience (Gorey et al., 2018). DO includes two subscales: Capacity for Harm (CH; persistence through very high levels of distress despite negative impact on quality of life) and Fear of Negative Evaluation (FNE; persistence through distressing situations due to fear that others will think negatively of them if they quit; Gorey et al., 2018). DO is a recently developed construct that demonstrates positive associations with depression, anxiety, and alcohol use (Gorey et al., 2018). Notably, DO has been conceptualized as a construct distinct from distress tolerance (DT; ability to withstand negative emotional or physical states; Akbari et al., 2022). For example, DO, as measured by the Distress Overtolerance Scale (DOS) is moderately negatively correlated with self-report measures of distress tolerance, such as the Distress Tolerance Scale (r=−0.56; Gorey et al., 2018; Simons & Gaher, 2005). Unique relations between DOS subscales (CH and FNE) and PTSD symptoms are unexplored.

Indeed, DO may be relevant to firefighter culture and training, which emphasizes the need to persevere through physically and psychologically distressing situations to fulfill the duties of the job (Bowers et al., 2019). Firefighters with elevated DO, specifically CH, may self-select into the fire service due to heightened levels of persistence. Furthermore, fire service training or fire culture may elevate DO across both CH and FNE, perhaps to an unhealthy extent among a subset of firefighters who persist in distressing circumstances despite experiencing harmful consequences. Therefore, we hypothesized that both CH and FNE would be positively associated with PTSD symptom severity among a sample of trauma-exposed firefighters. Exploratory analyses were conducted to evaluate associations with PTSD symptom clusters (i.e., intrusion, avoidance, negative alterations in cognitions and mood [NACM], arousal and reactivity). Covariates included years in the fire service, trauma load (i.e., number of traumatic event types experienced), and negative affect, as consistent with past literature (Akbari et al., 2022).

Method

Participants

Participants consisted of 282 firefighters (91.8% male, M_{age}=40.4, SD=9.6) from a large metropolitan area in the southern United States. Eligible participants were current part- or full-time volunteer, career, or combination firefighters, including those who provide emergency medical services (EMS). Eligibility criteria required participants to be at least 18

years of age and to endorse exposure to at least one traumatic event, per the *Diagnostic and Statistical Manual of Mental Disorders, 5th edition* (*DSM-5*) PTSD Criterion A (American Psychiatric Association, 2013). Exclusion criteria included a lack of English proficiency or an unwillingness to provide informed consent.

Measures

Participants provided demographic information; years in the fire service was employed as a covariate. The *Life Events Checklist for DSM-5* (LEC-5; Weathers et al., 2013) is a self-report measure used to screen for potentially traumatic events experienced throughout the lifespan. If participants indicated that an event "happened to me," "witnessed it," or was "part of my job," this was coded as a potentially traumatic event exposure. The 'trauma load' variable is the sum of the total number of traumatic event types experienced. The *PTSD Checklist for DSM-5* (PCL-5; Blevins et al., 2015) is a 20-item self-report questionnaire that measures PTSD symptom severity over the past month on a 5-point scale from 0 (*Not at all*) to 4 (*Extremely*) (Blevins et al., 2015). Total scores range from 0 to 80, with a suggested probable PTSD diagnostic cut-off score of 33 (Bovin et al., 2016). The PCL-5 total score and symptom cluster scores were evaluated as criterion variables. The *Distress Overtolerance Scale* (DOS; Gorey et al., 2018) is a 16-item self-report questionnaire that measures an individual's tendency to withstand very high levels of stress despite negative consequences to well-being. Each item is rated on a 6-point scale from 1 (*completely untrue of me*) to 6 (*completely true of me*). Scores range from 0–96 with higher scores indicating higher levels of DO. The subscales, Capacity for Harm (CH) and Fear of Negative Evaluation (FNE), were included as predictor variables. The *Positive and Negative Affect Schedule* (PANAS; Watson et al., 1988) is a well-established 20-item self-report questionnaire on which respondents indicate the extent to which they generally feel different feelings and emotions (e.g., "Enthusiastic" or "Irritable"). The Negative Affect subscale (PANAS-NA) was employed as a covariate. Internal consistencies for each measure are reported in Table 1.

Procedure

Participants were recruited for the study via email through nine departmental email distribution lists and invited to complete an online survey via Qualtrics, an online data capture platform. Once participants agreed to take part in the study, they were directed to the informed consent form. As compensation for participation, participants were given the option to enter a raffle to win various gift cards. This project was approved by all relevant institutional review boards and agencies.

Analytic Strategy

Analyses were conducted using SPSS version 27.0. First, we examined descriptive statistics and zero-order correlations among study variables. Second, we conducted a series of five, two-step hierarchical regressions for each of the criterion variables (PTSD symptom severity and four symptom cluster severity scores; PCL-5). For all analyses, step one included the following covariates: years in the fire service, trauma load (LEC-5 total score), and negative affect (PANAS-NA). The DOS subscales, CH and FNE, were included in step two. A Bonferroni correction was applied to control for Type I error ($\alpha=0.05/5=0.01$).

Results

The majority of the sample identified as white (80.9%), with 5.0% identifying as Black or African American, 4.3% as American Indian or Alaskan Native, 2.1% as Asian, 0.7% as Native Hawaiian or other Pacific Islander, and 7.1% as 'other'. Regarding ethnicity, 19.1% identified as Hispanic/Latinx. In terms of education, 42.2% completed high school or GED equivalent, 49.3% partially completed college, and 8.5% graduated college. An estimated 10.3% met criteria for probable PTSD per the PCL-5 (Bovin et al., 2016).

Please see Table 1 for descriptive statistics and bivariate correlations among variables of interest. Table 2 provides a summary of regression analyses. At step two, CH emerged as a significant incremental correlate with relation to PTSD total symptom severity, PTSD-NACM symptom severity, and PTSD-arousal and reactivity symptom severity, contributing 4.5%–6.1% of unique variance to the models. Neither CH nor FNE were significantly related to PTSD-intrusion or PTSD-avoidance symptoms.

Discussion

Hypotheses were partially supported, as CH was positively, incrementally associated with PTSD symptom severity as well as PTSD-related negative alterations in cognition and mood (NACM) and arousal/reactivity symptoms. Notably, FNE was not significantly associated with any PTSD-related outcomes. Indeed, it is plausible that CH may be more salient to PTSD NACM and arousal/reactivity symptoms for a subset of firefighters, as CH may be a correlate of the traditionally hypermasculine fire culture that promotes physical strength, stoicism, and lower emotional expressivity (Vujanovic & Tran, 2021). Persisting through intensely distressing situations is an aspect of firefighter training and harboring negative cognitions about the importance of doing so despite harmful consequences may be related to greater PTSD NACM symptoms (e.g., self-blame, guilt, negative mood) and arousal (e.g., hypervigilance, startle response, sleep disturbance, irritability) in the aftermath of potentially traumatic events. Thus, a tendency to engage in distressing situations despite harmful consequences may lead to heightened PTSD symptoms or may result from PTSD symptoms or both (Contractor et al., 2017). Conversely, firefighters who persist through distress due to fear of being negatively evaluated by their peers do not report heightened PTSD symptoms, as such persistence may be more relevant to mood symptoms or social anxiety (Farnsworth & Sewell, 2011). Further research is needed to explore contextual factors that may impact facets of DO among firefighters, for example, whether the distress is job- or family-related.

Interestingly, years in the fire service was positively related to trauma load, indicating greater trauma exposure with years of service; but negatively related to negative affect, possibly underscoring the resilience among firefighters who maintain greater years of service (Vujanovic & Tran, 2021). As expected, trauma load was significantly related to PTSD symptom variables at the bivariate level but not when considered in the context of other variables. Furthermore, negative affect emerged as a significant covariate related to all outcomes, consistent with a large body of research documenting associations between negative mood and PTSD symptomatology (e.g., Vujanovic et al., 2013).

Study limitations include the cross-sectional and self-report nature of the study design, which impedes conclusions about causality or temporality and introduces the potential for reporting bias. Additionally, the sample identified as predominantly white and male, limiting the generalizability of these findings to female, nonbinary, and gender fluid firefighters as well as firefighters from diverse racial and ethnic backgrounds. Future work might explore the temporality of relations between DO and PTSD and the moderating role of contextual factors (e.g., occupational stressors, discrimination) and individual differences (e.g., coping; personality traits).

Overall, DO-CH is a relatively novel and understudied construct in relation to PTSD symptoms, generally, and among firefighters, specifically. A bidirectional association may exist such that firefighters with a tendency to persist through distress despite negative impacts on their quality of life may experience greater PTSD symptoms; and conversely, firefighters with heightened PTSD symptoms may be more likely to tolerate distress despite negative consequences. Future work is needed to explore the temporal and causal nature of these associations among diverse samples of firefighters, using longitudinal and experimental designs.

Acknowledgments

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Clinical Impact Statement:

Results indicate that PTSD-specific interventions for firefighters may be improved upon by addressing the role of DO, specifically one's Capacity for Harm.

Table 1.

Descriptive statistics and bivariate correlations of study variables

	1	2	3	4	5	6	7	8	9	10	11
1. Years in the fire service [a]	--										
2. Trauma load (LEC-5) [a]	0.17**	--									
3. Negative Affect (PANAS NA) [a]	-0.13*	0.20**	--								
4. Distress Overtolerance (DOS)	-0.07	0.17**	0.57**	--							
5. Fear of Negative Evaluation (DOS FNE) [b]	-0.06	0.10	0.39**	0.82**	--						
6. Capacity for Harm (DOS CH) [b]	-0.07	0.18**	0.58**	0.96**	0.63**	--					
7. PTSD symptom severity (PCL-5 Total) [c]	-0.06	0.21**	0.66**	0.55**	0.41**	0.55**	--				
8. Intrusion symptoms (PCL-5) [c]	-0.05	0.18**	0.55**	0.37**	0.28**	0.36**	0.85**	--			
9. Avoidance symptoms (PCL-5) [c]	-0.03	0.15*	0.51**	0.43**	0.36**	0.40**	0.82**	0.74**	--		
10. NACM symptoms (PCL-5) [c]	-0.04	0.18**	0.63**	0.56**	0.40**	0.56**	0.94**	0.70**	0.69**	--	
11. Arousal/reactivity symptoms (PCL-5) [c]	-0.08	0.23**	0.65**	0.55**	0.42**	0.55**	0.93**	0.69**	0.67**	0.85**	--
Mean	15.22	10.66	14.91	2.67	3.46	2.31	12.00	2.54	1.49	3.78	4.20
SD	8.97	2.57	5.52	1.09	1.28	1.16	14.31	3.47	2.02	5.24	5.16
Observed range	1–40	1–15	10–42	1–6	1–6	1–6	0–66	0–18	0–8	0–25	0–20
Cronbach's alpha	N/A	N/A	0.88	0.94	0.84	0.94	0.95	0.88	0.88	0.90	0.88

Note. N=282;

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 p<0.01;

*
 p<0.05;

[a] Covariate.

[b] Predictor.

[c] Criterion. LEC-5=Life Events Checklist for *DSM-5* (Weathers et al., 2013); PANAS NA= Positive and Negative Affect Schedule Negative Affect subscale (Watson et al., 1988); DOS=Distress Overtolerance Scale (Gorey et al., 2018); FNE=Fear of Negative Evaluation subscale, CH=DOS Capacity for Harm subscale; PCL-5 Total and clusters=PTSD Checklist for *DSM-5* (Blevins et al., 2015).

Table 2.

Incremental associations of distress overtolerance facets and PTSD symptoms

PTSD Symptom Severity	B	SE	t	P	95% CI		R²	sr²
Step 1								
Years in the fire service	0.015	0.074	0.208	0.836	−0.130	0.161		0.000
Trauma load (LEC-5)	0.479	0.260	1.838	0.067	−0.034	0.991		0.007
Negative affect (PANAS NA)	**1.659**	**0.120**	**13.765**	**0.000**	**1.421**	**1.896**	**0.438**	**0.383**
Step 2								
Fear of Negative Evaluation (DOS FNE)	1.131	0.622	1.819	0.070	−0.093	2.355		0.006
Capacity for Harm (DOS CH)	**2.252**	**0.779**	**2.890**	**0.004**	**0.718**	**3.787**	**0.045**	**0.016**

PTSD Intrusion Symptoms (B)	B	SE	t	P	95% CI		R²	sr²
Step 1								
Years in the fire service	−0.002	0.021	−0.077	0.939	−0.042	0.039		0.000
Trauma load (LEC-5)	0.114	0.073	1.565	0.119	−0.029	0.257		0.007
Negative affect (PANAS NA)	**0.305**	**0.034**	**9.072**	**0.000**	**0.239**	**0.371**	**0.258**	**0.220**
Step 2								
Fear of Negative Evaluation (DOS FNE)	0.192	0.180	1.072	0.285	−0.161	0.546		0.003
Capacity for Harm (DOS CH)	0.163	0.225	0.725	0.469	−0.280	0.606	.009	0.001

PTSD Avoidance Symptoms (C)	B	SE	t	P	95% CI		R²	sr²
Step 1								
Years in the fire service	0.006	0.012	0.530	0.597	−0.017	0.030		0.001
Trauma load (LEC-5)	0.038	0.042	0.914	0.362	−0.044	0.121		0.002
Negative affect (PANAS NA)	**0.185**	**0.019**	**9.510**	**0.000**	**0.147**	**0.223**	**0.265**	**0.239**
Step 2								
Fear of Negative Evaluation (DOS FNE)	0.249	0.102	2.429	0.016	0.047	0.450		0.015
Capacity for Harm (DOS CH)	0.105	0.128	0.818	0.414	−0.148	0.358	.031	0.002

PTSD NACM Symptoms (D)	B	SE	t	P	95% CI		R²	sr²
Step 1								
Years in the fire service	0.021	0.028	0.732	0.465	−0.035	0.076		0.001
Trauma load (LEC-5)	0.100	0.099	1.006	0.315	−0.095	0.294		0.002
Negative affect (PANAS NA)	**0.587**	**0.046**	**12.836**	**0.000**	**0.497**	**0.677**	**0.394**	**0.359**
Step 2								
Fear of Negative Evaluation (DOS FNE)	0.254	0.234	1.089	0.277	−0.205	0.714		0.002
Capacity for Harm (DOS CH)	**1.177**	**0.293**	**4.021**	**0.000**	**0.601**	**1.753**	**0.061**	**0.032**

PTSD Arousal/reactivity Symptoms (E)	B	SE	t	p	95% CI		R²	sr²

	Predictor								
Step 1	Years in the fire service	−0.010	0.027	−0.370	0.712	−0.063	0.043		0.000
	Trauma load (LEC-5)	0.227	0.095	2.401	0.017	0.041	0.413		0.012
	Negative affect (PANAS NA)	**0.582**	**0.044**	**13.298**	**0.000**	**0.496**	**0.668**	**0.430**	**0.362**
Step 2	Fear of Negative Evaluation (DOS FNE)	0.435	0.226	1.931	0.055	−0.009	0.879		0.007
	Capacity for Harm (DOS CH)	**0.807**	**0.283**	**2.856**	**0.005**	**0.251**	**1.364**	**0.047**	**0.015**

Note. N=282. PTSD symptom severity and clusters measured by the PCL-5=PTSD Checklist for *DSM-5* (Blevins et al., 2015). LEC-5=Life Events Checklist for *DSM-5* (Weathers et al., 2013); PANAS NA= Positive and Negative Affect Schedule Negative Affect subscale (Watson et al., 1988); DOS=Distress Overtolerance Scale (Gorey et al., 2018): FNE=Fear of Negative Evaluation subscale, CH=DOS Capacity for Harm subscale.