Differences in psychiatric symptoms and barriers to mental health care between volunteer and career firefighters

Ian H. Stanley[a*]
Joseph W. Boffa[a]
Melanie A. Hom[a]
Nathan A. Kimbrel[b,c,d]
Thomas E. Joiner[a]

Authors' Affiliations:
[a]Department of Psychology, Florida State University, Tallahassee, FL USA
[b]Durham Veterans Affairs Medical Center, Durham, NC USA
[c]VA Mid-Atlantic Mental Illness Research, Education, and Clinical Center, Durham, NC USA
[d]Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC USA

***Corresponding Author**: Ian H. Stanley, Department of Psychology, Florida State University, Tallahassee, FL, 32306. Contact: stanley@psy.fsu.edu.

1. Introduction

Each year in the U.S., over 1,000,000 firefighters risk their lives by responding to high-risk emergencies(Haynes and Stein, 2016).The nature of the firefighter vocation (e.g., repeated exposure to painful and provocative experiences, erratic sleep schedules) likely posesa significant risk to firefighters' mental health. Indeed, past research has revealed elevated rates of a myriad of mental health problems among firefighters, including depression(Hom et al., 2016c), substance abuse(Carey et al., 2011),sleep disturbances(de Barros et al., 2012; Hom et al., 2016c), and posttraumatic stress symptoms (PTSS) and posttraumaticdisorder (PTSD; Heinrichs et al., 2005).Emerging research also suggests that firefighters may be at elevated risk for suicidal thoughts and behaviors(Chu et al., 2016; Henderson et al., 2016; Kimbrel et al., 2016; Stanley et al., 2016, 2015),likely in part due to repeated exposures to traumatic events(Boffa et al., 2017), including the suicide attempt of another person(Kimbrel et al., 2016).Given the scope of psychiatric symptoms that have been found to be elevated among firefighters, empirical efforts to examine firefighter-specific characteristics that may potentiate risk is warranted. In so doing, specific at-risk sub-populations can then be identified, allowing for targeted prevention and intervention efforts. Indeed, among the highest research priorities identified by the 2015 National Fire Service Research Agenda is that which aids in "identifying those individuals within the fire service who are at a higher risk for specific occupational injury/illness/disease"(National Fallen Firefighters Foundation, 2016a).

One major distinction between firefighters is whether they are serving in career versus volunteer departments. Of note, most U.S. firefighters are volunteers (69%), of whom the vast majority work in communities that serve fewer than 25,000 people (95%; Haynes and Stein, 2016). Moreover, of the estimated 29,980 fire departments in the U.S. in 2014, approximately

19,915 (66.4%) weredesignated as volunteer-only.Although the nature of volunteer and career firefighting is in many ways similar, there are important differences, among them being cumulative time exposed to potentially traumatic events, competing demands (e.g., volunteers often have a separate, paid job), and areas served.Indeed, it is possible that these factors create stress vulnerabilities that contribute to the development and/or exacerbation of psychiatric conditions. Moreover, it may be that organizational factors (e.g., more systematic and stringent recruitment and screening process within career compared to volunteer departments) may account for differences in psychiatric symptoms between these two fire service sectors. Potentially greater availability of mental health resources (e.g., access to employee assistance programs [EAPs], formal peer support training) among career compared to volunteer fire departments may also contribute to differences in psychiatric symptoms between volunteer and career firefighters.

Despite these conjectures, to our knowledge, no study has empirically examined differences in psychiatric symptoms between volunteer and career firefighters. Research examining mental health among firefighters has repeatedly relied on samples of career-only(Carey et al., 2011; Heinrichs et al., 2005) or volunteer-only(Bryant and Harvey, 1996)firefighters, or studies are ambiguous in this regard. We are only aware oftwo studies that have explicitly examined descriptive differences in mental health among a hybrid sample of firefighters (i.e., the sample included both career and volunteer firefighters; Haddock et al., 2012; Stanley et al., 2015).In a study of alcohol use among a sample of 656 firefighters (n=459 career, n=197 volunteer), 58% of career and 40% of volunteer firefighters reported heavy drinking; however, data were not presented on the statistical significance of this difference(Haddock et al., 2012).Additionally, in a large studyof 1,027 firefighters, volunteer firefighters were significantly

more likely than career firefighters to report career suicide plans and attempts in uncontrolled analyses(Stanley et al., 2015).These findings suggest that there may be meaningful differences between career and volunteer firefighters, underscoring these distinctions as an important area for future inquiry. However, these past examinations are limited in scope and do not systematically examine within-fire service differences in symptom severity across other domains (e.g., depression, insomnia, and PTSD).Moreover, although mental health services serve as a conduit to symptom reduction, no data exist on differential barriers to mental health service use among firefighters serving in volunteer versus career departments.

1.1. Study objective

The purpose of this study was to describe differences in psychiatric symptoms and barriers to mental health carebetween current U.S. firefighters in volunteer-only and career-only departments. Moreover, in exploratory mediation analyses, we aimed to determine if greater structural barriers to mental health care (e.g., cost, availability of resources) significantly accounted for the relationship between firefighter type (i.e., volunteer versus career)and psychiatric symptom levels. Given past research demonstrating elevated rates of specific psychiatric symptoms among firefighters generally, the following symptom domains were assessed: depression(Carey et al., 2011; Hom et al., 2016c),problematic alcohol use(Carey et al., 2011),insomnia(de Barros et al., 2012; Hom et al., 2016c),PTSS/PTSD(Heinrichs et al., 2005),and suicidality(Henderson et al., 2016; Kimbrel et al., in press; Stanley et al., 2016, 2015).Stigma-specific and structural barriers to mental health care were additionally assessed.

2. Methods

2.1. Participants and procedures

This study is a sub-investigation of a larger study examining suicidality among U.S. firefighters(Stanley et al., 2015).Firefighters were invited to participate through listserv and web-based announcements posted by fire organizations (February 2015). Respondents were presented with a web-based informed consent form, and completed self-report measures through Qualtrics, a secure web-based platform. Total study participation time averaged 30 minutes. Participants were given the option of receiving a $10 electronic gift card. The University'sIRB approved study procedures.

For the present investigation, only current firefighters with complete data on the variables of interest were included to increase relevance to current prevention and intervention efforts within the fire service. Likewise, firefighters from hybrid departments (i.e., those in which both career and volunteer firefighters serve) were excluded to increase specificity with regard to the primary study aim. Although the present sample was a convenience sample subject to differential responding biases, our sample characteristics (e.g., sex, years of service, rank distribution) werecomparable to national estimates(Haynes and Stein, 2016) and previous population-based studies of firefighter health(Poston et al., 2011).Among the 525 current firefighters in our sample, 204 (38.9%) were volunteersand 321 (61.1%) were career firefighters. Participant demographic and firefighter characteristicsare presented in Tables 1 and 2, respectively.

2.2. Measures

*2.2.1. Alcohol Use Disorders Identification Test (AUDIT-C; Bush et al., 1998).*The AUDIT-C is a 3-item self-report questionnaire that screens forproblematic alcohol use. Total scores range from 0-12; higher scores indicate more problematic alcohol use. The AUDIT-C demonstrated good internal consistency in the present study (α=0.81).

*2.2.2. Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977).*The CES-D, a 20-item self-report measure, was utilized to assess depression symptom severity. Respondents rate the extent to which they have experienceda given feeling or behavior in the past week. Total scores range from 0-60; higher scores indicate greater depression symptom severity. The CES-D has demonstrated good internal consistency, test-retest reliability, and construct validity(Devins et al., 1988; Radloff, 1977).Internal consistency for the CES-D in the present sample was good(α=0.84).

*2.2.3. Depressive Symptom Inventory—Suicidality Subscale (DSI–SS; Joiner et al., 2002).*The DSI-SS is a 4-item self-report measure that assesses the severity of suicidal symptoms, including thoughts, plans, and impulses. Individuals respond to each item on a 4-point Likert-type scale. Total scores range from 0-12; higher scores indicate a greater severity of suicidal ideation. For the present study, participants were asked to respond to DSI-SS questions based on their experiences since becoming a firefighter. The DSI-SS has good psychometric properties, and has been identified as one of three paragon brief measures for use in population-based research(Batterham et al., 2015).The DSI-SS demonstrated excellent internal consistency in the present study (α=0.91).

*2.2.4. Insomnia Severity Index (ISI; Bastien et al., 2001).*The ISI, a 7-item self-report measure, was utilized to assess the severity of insomnia symptoms (e.g., difficulties falling asleep). Total scores range from 0-28; higher scores indicate greater insomnia symptom severity. The ISI has good psychometric properties, including internal consistency and construct validity(Morin et al., 2011).The ISI demonstrated excellent internal consistent in the present study (α=0.91).

*2.2.5. PTSD Checklist-Civilian Version (PCL-C; Weathers et al., 1994).*The PCL-C is a 17-item self-report measure that assesses the severity of PTSD symptoms over the past month. Respondents rate the extent to which they have been bothered by various problems resulting from a stressful experience on a 5-point scale. Total scores range from 17-85; higher scores indicate greater severity of PTSD symptoms. The PCL-C has good psychometric properties as a brief screening instrument for PTSD(Wilkins et al., 2011),and it demonstrated excellent internal consistency in the present study (α=0.96).

*2.2.6. Self-Injurious Thoughts and Behaviors Interview-Short Form (SITBI-SF; Nock et al., 2007).*The SITBI-SF, a 72-item interview adapted in previous studies for use as a self-report measure(Zetterqvist et al., 2013), assesses the nature and timing of past and current suicidal thoughtsand behaviors. For the present study, a modified version of the SITBI-SF was used to assess participants' history of suicidal behavior during their firefighting careers. Past research has demonstrated that the SITBI-SF, as a whole, has high internal consistency (α=0.84-0.89; Nock et al., 2007). For the present study, single items from the SITBI-SF were used as dichotomous (i.e., present/absent) indicators of suicidal ideation, plans, attempts, and non-suicidal self-injury (NSSI). Given that each suicidality construct is measured with a single item, internal consistency statistics were not derivable for the present sample.

*2.2.7. Suicide Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001).*The SBQ-R is a 4-item self-report measure of suicide risk that assesses lifetime and past-year suicidal ideation as well as the future likelihood of engaging in suicidal behavior. Total scores range from 3-18; higher scores indicate greater suicide risk. The SBQ-R has good psychometric properties, and hasbeen identified as one of three paragon brief measures for use in population-based

research(Batterham et al., 2015).It demonstrated good internal consistency in the present study (α=0.85).

*2.2.8. Perceived Stigma Scale (PSS; Britt et al., 2008).*The PSS is an 11-item self-report measure that assesses the degree to which stigma-specific (e.g., would harm reputation; 6 items) and structural (e.g., cost, inadequate transportation, difficulty getting time off work; 5 items) barriers to care may prevent an individual from seeking mental health treatment. Total scores range from 11-55; higher scores indicate a report of greater barriers to care. Past research has demonstrated that the PSS has good internal consistency (α=0.70-0.82;Britt et al., 2008). The total PSS (α=0.91) and both the stigma-specific (α=0.94) and structural (α=0.86) subscales demonstrated good-to-excellent internal consistency in this study.

2.3. Statistical analysis

Descriptive statistics were used to describe the sample'sdemographic and firefighter characteristics. Pearson's *r* correlations were derived to examine intercorrelations among study measures. ANCOVA and logistic regression were used to examine differences between volunteer and career firefighters on demographic characteristics, psychiatric symptoms, and barriers to mental health care. All analyses were conducted in SPSS version 20.

3. Results

Bivariate correlations between study measures can be found in Table 3. Group differences between volunteer and career firefighters in psychiatric symptom levels and mental health treatment stigma can be found in Table 4.The following variables were included as controls in subsequent regression analyses, since statistically significant differences were observed between volunteer and career firefighters: age, sex, race, marital status, military status(Table 1);rank, years of service, emergency medical services (Table 2).

3.1. Problematic alcohol use

Career firefighters (M=4.79±2.80) reported higher levels of AUDIT-C problematic alcohol use compared to volunteer firefighters (M=4.06±2.52), F(1, 515)=8.107, p=0.005, η_p^2=0.015.

3.2. Depression symptoms

Volunteer firefighters (M=16.85±12.61) reported higher levels of CES-D depression symptoms compared to career firefighters (M=13.06±10.56), F(1, 515)=8.176, p=0.004, η_p^2=0.016.

3.3. Insomnia symptoms

There were no significant differences in ISI insomnia symptom severity between volunteer (M=10.31±6.79) and career firefighters (M=9.90±5.88), F(1, 515)=0.088, p=0.767, η_p^2=<0.001.

3.4. Posttraumatic stress symptoms

Volunteer firefighters (M=35.66±16.86) reported higher levels of PCL-C posttraumatic stress symptoms compared to career firefighters (M=31.68±12.92), F(1, 515)=6.925, p=0.009, η_p^2=0.013.

3.5. Suicidal thoughts and behaviors

On the DSI-SS, which assesses the severity of suicidal thoughts, plans, and impulses, there were no significant differences between volunteer (M=2.19±2.39) and career firefighters (M=1.97±2.37), F(1, 515)=0.772, p=0.380, η_p^2=0.001. On the SBQ-R, which assesses the severity of lifetime and past-year suicidal ideation as well as the future likelihood of engaging in suicidal behavior, volunteer firefighters (M=6.26±3.34) reported higher levels of suicidal symptoms compared to career firefighters (M=5.42±2.79), F(1, 515)=5.738, p=0.017,

η_p^2=0.011.On the SITBI-SF, which assesses the presence/absence of suicidal symptoms throughout one's tenure as a firefighter, volunteer firefighters reported higher rates of suicide plans (26.0% vs. 12.8%, adjusted odds ratio [AOR]=3.438 [95% CI: 1.715, 6.889], p<0.001) and suicide attempts (22.1% vs. 11.8%, AOR=2.588 [95% CI: 1.082, 6.189], p=0.033) compared to career firefighters. There were no significant differences in suicidal ideation (48.0% vs. 41.4%, AOR=1.312 [95% CI: .853, 2.018], p=0.217)or NSSI (23.0% vs. 12.1%, AOR=1.656 [95% CI: .725, 3.781], p=0.231).

3.6. Barriers to mental health care

There were no significant differences in overall PSS barriers to mental health care between volunteer (M=27.44±11.00) and career firefighters (M=25.03±8.88), F(1, 515)=2.278, p=0.132, η_p^2=0.004. When examining PSS subscales, there were no significant differences in PSS stigma-specific barriers to mental health care between volunteer (M=15.96±7.08) and career firefighters (M=16.19±6.51), F(1, 515)=0.659p=0.417, η_p^2=0.001. However, volunteer firefighters (M=11.48±5.41) reported higher levels of PSS structural barriers (e.g., cost, availability of resources) to mental health care as compared to career firefighters (M=8.84±4.00), F(1, 515)=22.958, p<0.001, η_p^2=0.042.

3.7. Exploratory mediation analyses

Given the abovementioned pattern of findings, we endeavored to test an exploratory hypothesis that the indirect effect of greater structural barriers to mental health care would significantly account for the relationship between firefighter type (i.e., volunteer versus career)and psychiatric symptom levels. As such, bootstrapped mediation analyses with 1,000 repetitions were conducted, consistent with guidelines recommended by Hayes(2013). A 95%

bias-corrected confidence interval (CI) around the point estimate of the indirect effect that does not cross zero indicates statistical significant mediation.

For *CES-D depression symptoms*, the direct effect of firefighter type on depression symptoms was not statistically significant (*B*=0.698, *SE*=0.934, *p*=0.455); however, the indirect effect of structural barriers to mental health care on the association between firefighter type and depression symptoms was statistically significant (*B*=3.099, *SE*=0.552, bootstrapped 95% CI=2.033-4.204).For *PCL-C posttraumatic stress symptoms*, the direct effect was not statistically significant (*B*=-0.071, *SE*=1.186, *p*=0.952); however, the indirect effect was statistically significant (*B*=4.054, *SE*=0.745, bootstrapped 95% CI=2.803-5.888).For *SBQ-R suicide risk*, the direct effect was not statistically significant (*B*=0.106, *SE*=0.254, *p*=0.676); however, the indirect effect was statistically significant (*B*=0.736, *SE*=0.148, bootstrapped 95% CI=0.454-1.033).For *SITBI-SF suicide plans*, the direct effect was not statistically significant (*B*=0.357, *SE*=0.259, *p*=0.167); however, the indirect effect was statistically significant (*B*=0.514, *SE*=0.118, bootstrapped 95% CI=0.329-0.800).For *SITBI-SF suicide attempts*, the direct effect was not statistically significant (*B*=0.070, *SE*=0.281, *p*=0.804); however, the indirect effect was statistically significant (*B*=0.622, *SE*=0.128, bootstrapped 95% CI=0.408-0.904).Given significant indirect effects but no significant direct effects in these mediation models, each model indicates that the relationship between firefighter type (i.e., volunteer versus career) and psychiatric symptoms is fully mediated by structural barriers to mental health care.

4. Discussion

Volunteer firefighters in this sample reported markedly elevated levels of depression, posttraumatic stress, and suicidal symptoms (namely, suicide plans and attempts) as well as greater structural barriers to mental health treatment (e.g., cost, availability of

resources)compared to career firefighters. In contrast, career firefighters in this sample reported relatively elevated levels of problematic alcohol use, which is in accord with past research (Haddock et al., 2012). There were no significant differences observed between volunteer and career firefighters with respect to insomnia symptom severity or stigma-specific barriers to mental health care. These findings were significant even after controlling for severaldemographic and firefighter characteristics, underscoring the robustness of our findings.

Although the present study is not positioned to answer why volunteers report elevated levels of psychiatric symptom across multiple domains, we recapitulate and expand onseveral speculations as a springboard for future research. For one, the recruitment and screening process may be more systematic and stringent for career compared to volunteer firefighters, yielding a healthier workforce. In this regard, it would be important for future research to examine trajectories of psychiatric symptoms and disorders by examining firefighters prior to, during, and after their firefighter career. This approach is consistent with recent research among analog populations—that is, soldiers—demonstrating that pre-enlistment psychiatric disorders account for a nontrivial proportion of the variance in post-enlistment psychiatric conditions(Nock et al., 2014). Moreover, the sudden, cyclical transition to and from civilian life for volunteer firefighters may create a more jarring experience in the face of repeated traumatic exposures, resulting in elevated psychiatric symptomatology. Further, psychiatric symptoms in volunteer firefighters may be elevated compared to career firefighters because career firefighters may have been reluctant to honestly answer these self-report questions for fear of potential employment repercussions (e.g., termination if deemed unfit for duty). However, the likelihood of this is

tempered by the anonymous nature of the survey[a]and by study findings that there were no significant differences in reported stigma-specific barriers to mental health care.

Findings of the present investigation suggest that moreprevention and treatment efforts are needed among firefighters. The aforementioned psychiatric symptoms are treatable; for example, PTSD is treatable via prolonged exposure (Cusack et al., 2016). Nevertheless, a recent systematic review examining treatment studies for first responders has revealed an alarming dearth of available scientific evidence to inform treatment recommendations for this population (Haugen et al., 2012). As such, interventions targeting suicidality and suicide-related conditions (e.g., PTSD) must be developed for and scientifically tested among this unique population(Haugen et al., 2012).

However, the existence of efficacious interventions is only useful insofar as at-risk individuals are accessing these services. Our finding that greater structural barriers to mental health care statistically mediated the relationship between firefighter type and psychiatric symptoms is particularly striking. Indeed, volunteer firefighters may have less access to mental health services (e.g., EAPs) that employ clinicians knowledgeable of firefighter culture(Hom et al., 2016b). Similarly, volunteer firefighters may receive fewerformal trainings and organizational supports to manage stress, creating missed opportunities to inoculate against the development or exacerbation of psychiatric conditions.

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[a]At the end of the survey, respondents who elected to receive compensation for participation provided their email address to which an electronic gift card was sent. Respondents were informed that the email address was kept separate from the survey data. Recent research among firefighters has demonstrated that individuals who elect to receive compensation for web-based surveys (and in doing so provide potentially identifying information) do not systematically underreport psychiatric symptoms(Hom et al., 2016a). Moreover, post-hoc analyses in the present study revealed no statistically significant differences in requests to receive study compensation between volunteer and career firefighters (87.1% and 80.7%, respectively; χ^2=3.678, p=0.056), suggesting comparable disclosure of potentially identifying information between these two groups.

Taken together, findings highlight a need to increase mental health services among firefighters (Henderson et al., 2016; Hom et al., 2016b).This is reflected by policy statements and research agendas from leading fire service organizations. For example, the National Fallen Firefighters Foundation (NFFF) Firefighter Life Safety Initiative #13 states, “Firefighters and their family members must have access to counseling and psychological support”(National Fallen Firefighters Foundation, 2016b).It should be emphasized that volunteer firefighters reported greater structural barriers to mental health care, such as cost, transportation, and availability of resources. Thus, efforts to increase the availability and accessibility of mental health resources should additionally focus on volunteer departments. Among firefighters, specifically, one pilot study aimed at increasing mental health services use among firefighters has been published in the scientific literature(Gulliver et al., 2016).This video-based interventionappears to be acceptable to firefighters, and outcome data on help-seeking behaviors are forthcoming.

4.1. Limitations

Several study limitations must be noted. First, the data are cross-sectional and the timing of onset of psychiatric symptoms is unknown; it could be that for some respondents, depression symptoms predated one’s tenure as a firefighter. Second, the sample was not recruited utilizing a probability sampling strategy and may therefore not be representative of the fire service at large; however, the sample characteristics generally mirror the U.S. firefighter population characteristics(Haynes and Stein, 2016; Poston et al., 2011).Third, our sample included mostly males, and research on female firefightersis needed. Fourth, only current membership in a volunteer-only or career-only department was assessed, and data are not available if an individual transitioned from one role to another (e.g., a career firefighter who retired then served

as a volunteer). Thus, it could be that some individuals classified as a volunteer firefighter were at one point also a career firefighter. Fifth, other important fire service variables (e.g., number of hours worked weekly, number of firefighters within one's department) were not assessed, and it is possible these variables would explain some of the variances in our criterion variables.Sixth, although statistically significant differences were observed in psychiatric symptom levels, some of the effect sizes were small, suggesting that some of the differences may not be clinically significant. Finally, although psychiatric symptoms were assessed via commonly used, psychometrically sound self-report scales, self-reported psychiatric symptoms do not necessarily correspond to psychiatric diagnoses. Thus, we were only able to report on symptom severity and not psychiatric diagnoses, of whichthe latter may be a more robustindicator of treatment need.

4.2. Conclusions

Volunteer firefighters generally reported elevated psychiatric symptoms, including depression, posttraumatic stress, and suicide plans and attempts, whereas career firefighters reported elevated levels of problematic alcohol use. Greater structural barriers to mental health care (e.g., cost, availability of resources) may explain the increased psychiatric symptom levels observed among volunteer firefighters. Increased efforts are needed to prevent and treat psychiatric symptoms among firefighters, and to boost theiraccess to and utilization of mental health services. Organizational differences between volunteer and career fire departments should be considered.

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Tables

Table 1: Demographic Characteristics Stratified by Firefighter Respondents in Volunteer-Only Versus Career-Only Departments: United States, 2015

	Total sample		**Volunteer-only**		**Career-only**		**Group differences**
Characteristic	**Total N = 525**	**Valid %**	**Total n = 204**	**Valid %**	**Total n = 321**	**Valid %**	
Age	M=37.72±10.81, Range=18-68		M=36.04±11.54, Range=18-68		M=38.79±10.20 Range=19-63		$F(1, 523) = 8.188$, p = 0.004
Sex							$\chi^2 = 16.021$, $p<0.001$
Male	480	91.4%	174	85.3%	306	95.3%	
Female	45	8.6%	30	14.7%	15	4.4%	
Race/Ethnicity							$\chi^2 = 47.054$, $p<0.001$
White	463	88.2%	167	81.9%	296	92.2%	
Hispanic or Latino	14	2.7%	1	0.5%	13	4.0%	
Native American or Alaska Native	39	7.4%	34	16.7%	5	1.6%	
Other	9	1.7%	2	1.0%	7	2.2%	
Marital Status							$\chi^2 = 33.425$, $p<0.001$
Married	390	74.3%	126	61.8%	264	82.2%	
Divorced or Separated	38	7.2%	16	7.8%	22	6.9%	
Widowed	5	1.0%	4	2.0%	1	0.3%	
Never Married	92	17.5%	58	28.4%	34	10.6%	
Military Status							$\chi^2 = 40.739$, $p<0.001$
Active Duty	47	9.0%	36	17.6%	11	3.4%	
Reserves	34	6.5%	4	2.0%	30	9.3%	
National Guard	12	2.3%	5	2.5%	7	2.2%	
Veteran or Retiree	37	7.0%	11	5.4%	26	8.1%	
Other	6	1.1%	3	1.5%	3	0.9%	
Civilian (No Military Service)	389	74.1%	145	71.1%	244	76.0%	

Table 2: Firefighter Characteristics Stratified by Respondents in Volunteer-Only Versus Career-Only Departments: United States, 2015

	Total sample		**Volunteer-only**		**Career-only**		**Group differences**
Characteristic	**Total N = 525**	**Valid %**	**Total n = 204**	**Valid %**	**Total n = 321**	**Valid %**	
Firefighter Rank							$\chi^2 = 74.783$, $p<0.001$
Firefighter I	63	12.0%	46	22.5%	17	5.3%	
Firefighter II	113	21.5%	39	19.1%	74	23.1%	
Engineer/Technician/Chauffeur	67	12.8%	25	12.3%	42	13.1%	
Sergeant	24	4.6%	1	0.5%	23	7.2%	
Lieutenant	76	14.5%	30	14.7%	46	14.3%	
Captain	68	13.0%	22	10.8%	46	14.3%	
Chief Officers[1]	77	14.7%	25	12.3%	52	16.2%	
Other	37	7.0%	16	7.8%	21	6.5%	
Years of Service as Firefighter	M=15.22±10.31,		M=12.58±10.70		M=16.91±9.70		$F(1, 523) = 22.924$, $p<0.001$
Department EMS							$\chi^2 = 61.259$, $p<0.001$
Yes	488	93.0%	171	83.8%	317	98.8%	
No	37	7.0%	33	16.2%	4	1.2%	

Note.EMS = emergency medical services;[1]Chief Officers include Battalion Chiefs, Assistant Chiefs, Deputy Chiefs, and Commissioners. These individuals were collapsed into a single category for privacy concerns, given the relatively small number of individuals within the fire service having a ranking within the Chief structure or as a Commissioner.

Table 3: Intercorrelations of Measures: United States, 2015

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Type of Department	1													
2. AUDIT-C Alcohol Use	-0.132**	1												
3. CES-D Depression	0.161**	0.166**	1											
4. DSI-SS Career Suicidal Ideation	0.045	0.156**	0.586**	1										
5. ISI Insomnia	0.032	0.156**	0.673**	0.422**	1									
6. PCL-C PTSD Symptoms	0.132**	0.217**	0.851**	0.596**	0.704**	1								
7. SBQ-R Suicide Risk	0.135**	0.224**	0.717**	0.837**	0.444**	0.697**	1							
8. PSS Total	0.120**	0.146**	0.480**	0.330**	0.386**	0.479**	0.414**	1						
9. PSS Stigma-Specific	-0.017	0.141**	0.350**	0.241**	0.310**	0.345**	0.290**	0.900**	1					
10. PSS Structural	0.270**	0.101*	0.494**	0.339**	0.357**	0.499**	0.443**	0.788**	0.441**	1				
11. SITBI-SF Career Suicidal Ideation	0.065	0.146**	0.550**	0.877**	0.434**	0.567**	0.759**	0.282**	0.187**	0.316**	1			
12. SITBI-SF Career Suicide Plans	0.168**	0.164**	0.606**	0.659**	0.343**	0.644**	0.762**	0.324**	0.195**	0.392**	0.517**	1		
13. SITBI-SF Career Suicide Attempts	0.137**	0.210**	0.608**	0.577**	0.347**	0.635**	0.729**	0.316**	0.157**	0.429**	0.468**	0.833**	1	
14. SITBI Career Non-Suicidal Self-Injury	0.143**	0.149**	0.554**	0.517**	0.336**	0.584**	0.649**	0.248**	0.088*	0.386**	0.458**	0.720**	0.753**	1

Note. AUDIT-C = Alcohol Use Disorders Identification Test; CES-D = Center for Epidemiologic Studies Depression Scale; DSI-SS = Depressive Symptom Inventory Suicidality Subscale; ISI = Insomnia Severity Index; INQ = Interpersonal Needs Questionnaire; PCL-C = PTSD Checklist-Civilian Version; PSS = Perceived Stigma Scale; SBQ-R = Suicide Behaviors Questionnaire-Revised; SITBI-SF = Self-Injurious Thoughts and Behaviors Interview-Short Form. "Career" suicidal ideation, suicide plans, suicide attempts, and non-suicidal self-injury refers to suicidal symptoms since beginning one's career as either a volunteer-only or career-only firefighter.

Type of Department (1 = Volunteer-only, 0 = Career-only) and SITBI-SF variables (1 = Yes, 0 = No) are dichotomous variables that are included in the correlation matrix for descriptive purposes.

*p<0.05, **p<0.01

Table 4: Psychiatric Symptoms Stratified by Firefighter Respondents in Volunteer-Only Versus Career-Only Departments: United States, 2015

Characteristic	**Total sample (*N* = 525)**		**Volunteer-only (*n* = 204)**		**Career-only (*n* = 321)**		**Group differences**		
	M	**SD**	***M***	**SD**	***M***	**SD**	***F (1, 515)*[a]**	***p***	**η_p^2**
AUDIT-C Alcohol Use	4.51	2.72	4.06	2.52	4.79	2.80	8.107	0.005**	0.015
CES-D Depression	14.53	11.54	16.85	12.61	13.06	10.56	8.176	0.004**	0.016
ISI Insomnia	10.06	6.25	10.31	6.79	9.90	5.88	0.088	0.767	<0.001
PCL-C PTSD Symptoms	33.23	14.69	35.66	16.86	31.68	12.92	6.925	0.009**	0.013
DSI-SS Career Suicidal Ideation	2.05	2.38	2.19	2.39	1.97	2.37	0.772	0.380	0.001
SBQ-R Suicide Risk	5.74	3.04	6.26	3.34	5.42	2.79	5.738	0.017*	0.011
PSS Total	25.97	9.82	27.44	11.00	25.03	8.88	2.278	0.132	0.004
PSS – Stigma-Specific Barriers	16.10	6.74	15.96	7.08	16.19	6.51	0.659	0.417	0.001
PSS – Structural Barriers	9.86	4.77	11.48	5.41	8.84	4.00	22.958	<0.001***	0.042
	n	**%**	***n***	**%**	***n***	**%**	***AOR***	***p***	**95% CI**
SITBI-SF Career Suicidal Ideation	231	44.0%	98	48.0%	133	41.4%	1.312	0.217	0.853, 2.018
SITBI-SF Career Suicide Plans	94	17.9%	53	26.0%	41	12.8%	3.438	<0.001***	1.715, 6.889
SITBI-SF Career Suicide Attempts	83	15.8%	45	22.1%	38	11.8%	2.588	0.033*	1.082, 6.189
SITBI-SF Career Non-Suicidal Self-Injury	86	16.4%	47	23.0%	39	12.1%	1.656	0.231	0.725, 3.781

Note. AOR = adjusted odds ratio; AUDIT-C = Alcohol Use Disorders Identification Test; CES-D = Center for Epidemiologic Studies Depression Scale; DSI-SS = Depressive Symptom Inventory Suicidality Subscale; ISI = Insomnia Severity Index; INQ = Interpersonal Needs Questionnaire; PCL-C = PTSD Checklist-Civilian Version; SBQ-R = Suicide Behaviors Questionnaire-Revised; SITBI-SF = Self-Injurious Thoughts and Behaviors Interview-Short Form. "Career" suicidal ideation, suicide plans, suicide attempts, and non-suicidal self-injury refers to suicidal symptoms since beginning one's career as either a volunteer-only or career-only firefighter.

[a]Analyses presented control fordemographic (i.e., age, sex, race, marital status, military status) and firefighter characteristics (i.e., rank, years of service, emergency medical services).

*p<0.05, **p<0.01, ***p<0.001