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Dissecting the Interrelations of Suicidality and Mental Health Across First Responder Subtypes Seeking Treatment: A Cross-Sectional Study

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Abstract

First responders are routinely exposed to traumatic events that can affect their mental health to the extent of suicidal ideation and suicide completion. The purpose of our study is to inform the comparability of predictors of suicidality across first responder types to elucidate the most efficacious targets for intervention and clinical intercession. Clients (*N* = 224) sought counseling services between 2015 and 2020 at a not-for-profit organization. We conducted a matched study with cases defined as those with suicidality at baseline and those without suicidality at baseline (controls). First responder types were law enforcement officers (LEOs), firefighters, and emergency medical technicians. Clients were mostly LEOs (41.5%), followed by firefighters (29.9%) and emergency medical technicians (28.6%). Logistic regression models tested the relationship between mental health measures and suicidality. All measures of mental health constructs varied significantly across those with or without suicidality and differed across first responder subtype. Depression and posttraumatic stress disorder were significant predictors of suicidality for both LEOs and firefighters. Alcohol/substance misuse was only a significant predictor among LEOs. Resilience was a protective factor for both LEOs and emergency medical technicians. Specific differences in predictors of suicidality across first responder subtypes may enable occupation-specific targets for mental healthcare.

Note: We would like to thank the first responders who continue to selflessly service our communities.

Introduction

First responders (FRs) including (law enforcement officers [LEOs], firefighters [FFs], and emergency medical technicians [EMTs]) are routinely exposed to traumatic events that can have a negative impact on their mental health (Donnelly & Bennett, 2014; Jetelina et al., 2020; Klimley et al., 2018; Weiss et al., 2010). As a result, their mental health can deteriorate to the extent of suicidal ideation, suicidal plans, and suicide completion (Beauchamp & Jetelina, 2022; Chopko, et al., 2014; Gist et al., 2011; Steyn et al., 2013; Stuart, 2008; Violanti & Gehrke, 2004; Violanti et al., 2008). Kleim and Westphal (2011) found that two diagnoses, often related to suicidality (i.e., posttraumatic stress disorder [PTSD] and major depressive disorder [MDD]), were most frequent after a traumatic stressor for FRs. Additionally, suicidality has been noted as a comorbid problem among all FR subtypes (Klimley et al., 2018; Stanley et al., 2016; Violanti et al., 2019).

While suicidality is one of the most common comorbidities in FRs (Jetelina et al., 2020), it can be hard to detect and treat. Consequently, there have been several theoretical frameworks attempting to conceptualize antecedents to suicidality in the largest group of FRs, namely LEOs. For example, the Strain Theory suggests that, after a person is exposed to trauma, they can be pushed or pulled in several directions (Agnew, 2001; Violanti et al., 2019). Another example is the Interpersonal Theory of Suicide (Van Orden et al., 2010). It posits that thwarting a sense of belonging and perceiving a sense of being a burden along with acquiring capability are the core constructs necessary for someone to die by suicide in situations where there is both desire and ability (Joiner, 2007; Van Orden et al., 2010). While the other FR subtypes display similar levels of suicidality, less research is available to support the applicability of these frameworks across groups (i.e., LEOs, FFs, and EMTs).

Literature Review

The prevalence of comorbid conditions, such as PTSD among EMTs and FFs, is of growing concern. Recently, it was estimated that between 17% and 22% of FFs suffer from PTSD (Klimley et al., 2018). Statistics on mental health outcomes can vary for paramedics because, in some jurisdictions, their occupation often includes dual roles of EMTs and FFs (Jones et al., 2018; U.S. Fire Administration, 2022). However, Bennett and colleagues (2004) found EMTs and paramedics have similarly high prevalence rates; 22% reported PTSD and 10% reported MDD. A more recent study comparing the differences in suicidality among EMS professionals found that 19.3% screened positive for suicidality whereas 26.4% screened positive in a treatment-seeking sample (Carbajal et al., 2022). In that same study, researchers showed that 40.4% of a nontreatment-seeking sample of EMTs screened positive for PTSD, 31.6% were positive for depression, and 40.4% screened positive for generalized anxiety; whereas, among EMTs who are in treatment, 64.2% suffer from PTSD, 64.2% showed depression, and 81.1% screened positive for generalized anxiety (Carbajal et al., 2022).

Similarly, research has also shown a difference in the prevalence of comorbid mental illnesses of LEOs across those receiving and not receiving therapeutic services (Ponder et al., 2022). Approximately 25% (24.9%) of LEOs not in therapy screened positive for PTSD compared with 61.3% of LEOs in treatment. Of those not in treatment, 13% screened positive for depression whereas 42.3% of those in treatment screened positive for depression. Generalized anxiety had the greatest disparity with 9.5% of LEOs not in treatment screening positive as opposed to 62.0% in treatment (Ponder et al., 2022). Results also indicated that the nontreatment-seeking samples' odds of experiencing suicidality was 1.76 times the odds for those LEOs in treatment (Ponder et al., 2022).

Wild et al. (2020) conducted a systematic review of the efficacy of interventions targeted at improving well-being and resilience for FRs as a protective factor against their occupational stress. They identified five modifiable risk factors that previous research has shown to predict PTSD and depression among FRs: (a) personality, (b) coping, (c) cognitions, (d) social support, and (e) physical inactivity. There were five different types or themes under which potential interventions fit: (a) physical exercise, (b) psychological treatment, (c) stress management, (d) self-regulation, and (e) debriefing after a potentially traumatic incident (Wild et al., 2020). However, the literature, in summary, has been able to conclude that self-regulation interventions and debriefing were noneffective methods (McCraty & Atkinson, 2012; Ramey et al., 2017; Tuckey & Scott, 2014). Establishment of interventions has been hampered by the lack of a strong evidentiary base to support the risk factors of suicidality and the conflicting findings with regard to FR subtypes (Bond & Anestis, 2021). It is still necessary to study the comorbidity of mental health conditions and suicidality across FR subtypes.

Purpose of the Study

Our current study evaluated how mental health, personal traits, and professional characteristics may differ in influence and strength of association with suicidality across the FR occupational subtypes. The purpose of our study was to inform the comparability of predictors of suicidality across FR subtypes to better elucidate the most efficacious targets for intervention and clinical intercession.

Methods

Participants

Data were collected at intake from FRs who sought counseling services between 2015 and 2020 at a not-for-profit organization in the Dallas-Fort Worth metroplex. The not-for-profit organization serves veterans, FRs, frontline healthcare workers, and their families. Their mission statement is *to create a community that raises awareness and combats suicide by empowering veterans, first responders, and their families through traditional and non-traditional therapies*. This secondary analysis of program data was approved, and a waiver of informed consent was granted by the University of Texas Health Science Center Institutional Review Board (HSC-SPH-20-1264). The study participants included adults (≥18 years) who identified as a FF, LEO, or EMT, with an available suicidality measure (Suicide Behavior Questionnaire-Revised [SBQ-R]) at baseline.

Measures

Our study used a demographic questionnaire and seven standardized assessment instruments. The self-report measures assessed suicidality, resilience, possible substance use disorders, possible alcohol use disorders, PTSD, depression, and generalized anxiety. The internal consistency and reliability of these multi-item measures were assessed using Cronbach's alpha. A higher score, ranging from 0 to 1, indicates that participants had greater agreeability across measurement items.

Suicide Behavior Questionnaire-Revised (SBQ-R)
Osman et al. (2001) developed the SBQ-R, which assesses suicidality. It probes four different dimensions of suicidality: (1) lifetime suicidal ideation and/or suicide attempt, (2) frequency of suicidal ideation over the past 12 months, (3) threat of suicide attempt, and (4) self-reported likelihood of suicidal behavior in the future (Osman et al., 2001). SBQ-R scores ranged from 3 to 18, with higher scores indicating higher risk of suicide. In our current study, the Cronbach's alpha of the scale was 0.85. The outcome measure of suicidality was dichotomized with cases identified as those with a SBQ-R score ≥ 7 and controls with a SBQ-R score < 7, given that the sample consisted of an outpatient population.

Response to Stressful Experiences Scale (RSES-22)
Johnson et al. (2011) developed the Response to Stressful Experiences Scale (RSES-22), which assesses

resilience and has been validated on FRs (Ponder et al., 2021). Clients respond to the prompt during and after life's most stressful events (I tend to…) on a 5-point Likert scale from 0 (not at all like me) to 4 (exactly like me). Total scores ranged from 0 to 88 where higher scores represented greater resilience. In their initial study, Johnson et al. (2011) concluded that the RSES-22 showed good internal consistency (α = .92) and test-retest reliability (α = .87). In the current study, Cronbach's alpha of the scale was 0.93.

CAGE Adapted to Include Drugs (CAGE-AID)

Substance use was measured using the CAGE Adapted to Include Drugs (CAGE-AID). The CAGE-AID (Brown et al., 1998; Palomino et al., 2012) was created as an adaptation of the CAGE alcohol assessment tool (Brown & Rounds, 1995). The CAGE-AID is a four-item measure with a possible response of yes or no to each of the questions. An answer of "yes" to any two of the questions indicates possible substance use disorder, which indicates clients should undergo further testing. Brown et al. (1998) found that the CAGE-AID performs with a sensitivity of 70.9% and a specificity of 75.7% among adult populations. In our current study, the Cronbach's alpha of the scale was 0.88.

Alcohol Use Disorders Identification Test (AUDIT)

Alcohol consumption was measured using the Alcohol Use Disorders Identification Test (AUDIT). Saunders et al. (1993) developed the AUDIT, which is a 10-question measure with possible responses to each question being scored between 0 and 4. The range of possible scores is from 0 to 40 where 0 indicates an abstainer who has never had any problems from alcohol. A score of 1–7 suggests low-risk consumption; any score from 8–14 suggests hazardous or harmful alcohol consumption; scores of 15 or more indicate the likelihood of alcohol dependence (moderate-severe alcohol use disorder). In our current study, Cronbach's alpha of the scale was 0.90.

PTSD Checklist-5 (PCL-5)

Blevins et al. (2015) developed the PTSD Checklist-5 (PCL-5) to assess for the presence of PTSD, which is consistent with the DSM-5 that has been validated on FRs (Ahmadi et al., advance online publication). The PCL-5 has 20 questions that are on a Likert scale from not at all (0) to extremely (4), which are totaled, and an aggregated score ranging from 0 to 80 is created. Higher scores indicate the more severe presence of PTSD symptomatology. In our current study, the Cronbach's alpha of the scale was 0.93.

Patient Health Questionnaire-9 (PHQ-9)

Kroenke et al. (2001) developed the Patient Health Questionnaire-9 (PHQ-9) to assess the presence of depression that has been validated on FRs (Ahmadi et al., advance online publication). The PHQ-9 responses range from not at all (0) to nearly every day (3), and scores are summed to a continuous score ranging from 0 to 27. Higher scores represent the greater severity of depression. In our current study, the Cronbach's alpha of the scale was 0.88.

Generalized Anxiety Disorder-7 (GAD-7)

Spitzer et al. (2006) developed the Generalized Anxiety Disorder-7 (GAD-7) to screen for Generalized Anxiety Disorder (GAD) that has been validated on FRs (Ahmadi et al., advance online publication). The GAD-7 responses ranged from not at all (0) to nearly every day (3), and aggregated continuous scores ranged from 0 to 21. Higher scores indicated a greater severity of anxiety. In our current study, the Cronbach's alpha of the scale was 0.91.

Data Analysis

Univariate (i.e., tabulations, frequencies, means, standard deviations) and bivariate (i.e., X^2-test and Wilcoxon rank sum test) statistics were used to describe the sample across FRs with (i.e., case) and without (i.e., control) suicidality. Patterns of missingness were assessed using missing-value tables and pattern analysis. Sensitivity analyses were performed for variables with significant proportions of missingness (>25%), and it

was determined that all values were missing completely at random. Cases were caliper matched on age, with a caliper of 5 years, and individual matched on gender to two controls at a 100% match rate. Matching criteria were chosen based on the known confounding relationship (Bishopp & Boots, 2014; Colorado Department of Public Health & Environment et al., 2015; Stanley et al., 2016; Violanti et al., 2009). Logistic regression models tested the bivariate relationship between mental health and sociodemographic characteristics, while adjusting for the matching criteria for all FRs collectively as well as FRs stratified by subtype. Mantel-Haenszel tests of homogeneity were conducted across the FR subtype strata to test for interaction. All analyses were performed using Stata 16.0 (StataCorp, College Station, TX).

Results

Table 1 displays the sociodemographic and mental health characteristics across FRs with and without suicidality (N = 224). LEOs (41.5%) were the most represented group of FRs, followed by FFs (29.9%) and EMTs (28.6%). The FRs were largely male (75.0%), approximately 37 years old (SD = 9.7 years) on average, mostly non-Hispanic white (77.1%), college educated (51.7%), and married (55.3%). The length of time as a FR and work shift varied, with the largest group reporting 5 or fewer years of service (34.7%), and the largest group belonging to the day shift (41.6%). All mental health assessments varied significantly across cases and controls. All other measures of sociodemographic data (e.g., gender, age, race/ethnicity, education, length of first responder service, shift, and veterans), with the exception of relationship status, did not show significant differences across the cases and controls.

Table 1. *Characteristics of Cases and Controls Among Treatment-Seeking First Responders*

	All (N = 224) N (%)	Suicidality (N = 75) N (%)	No Suicidality (N = 149) N (%)	X^2 & Wilcoxon Rank Sum p value
First Responder Type				**0.002**
Law Enforcement Officer	93 (41.5)	19 (25.3)	74 (49.7)	
Emergency Medical Technician	64 (28.6)	29 (38.7)	35 (23.5)	
Firefighter	67 (29.9)	27 (36.0)	40 (26.9)	
Mental Health Measures, *Mean (SD***)**				
GAD-7	12.2 (6.2)	13.6 (5.3)	11.6 (6.5)	0.0592
PHQ-9	11.3 (6.1)	13.6 (4.7)	10.2 (6.4)	**0.0005**
PCL-5	34.5 (18.5)	43.5 (15.8)	30.3 (18.2)	**<0.0001**
CAGE-AID	1.3 (1.6)	1.9 (1.7)	1.0 (1.5)	**0.0029**
AUDIT	7.8 (7.9)	10.4 (9.5)	6.3 (6.5)	**0.0222**
RSES-22	60.0 (14.1)	53.7 (15.0)	63.2 (12.6)	**<0.0001**
Male	168 (75.0)	56 (74.7)	112 (75.2)	0.935
Age, *Mean (SD)*	36.5 (9.7)	36.6 (9.9)	36.5 (9.6)	0.9241
Race/ethnicity				0.4800
NH White	158 (77.1)	46 (73.2)	112 (78.9)	
NH Other	20 (9.8)	6 (9.5)	14 (9.9)	
Hispanic	27 (13.2)	11 (17.5)	16 (11.3)	
Education				0.634
≤HS Diploma	42 (19.9)	15 (22.7)	27 (18.6)	
Some College	60 (28.4)	20 (30.3)	40 (27.6)	
≥College Degree	109 (51.7)	31(47.0)	78 (51.7)	
Relationship Status				**0.0330**
Single	38 (17.5)	17 (24.3)	21 (14.3)	
Married	120 (55.3)	30 (42.9)	90 (61.2)	
Other	59 (27.2)	23 (32.9)	36 (24.5)	
Length of Service				0.7770
≤ 5 years	76 (34.7)	25 (40.3)	51 (36.2)	
6–10 years	36 (17.7)	9 (14.5)	27 (19.2)	
11–15 years	36 (17.7)	9 (14.5)	27 (19.2)	
16–20 years	19 (9.4)	6 (9.7)	13 (9.2)	
≥ 20 years	36 (17.7)	13 (21.0)	23 (16.3)	
Shift				0.297
Day	77 (41.6)	21 (35.0)	56 (44.4)	
Swing	30 (16.2)	11 (18.3)	19 (15.1)	
Graveyard	38 (20.5)	10 (16.7)	28 (22.2)	
Rotating	40 (21.6)	17 (28.3)	23 (18.3)	
Veteran	34 (26.4)	11 (32.4)	23 (24.2)	0.355

Abbreviations: GAD-7 = Generalized Anxiety Disorder-7; PHQ-9 = Patient Health Questionnaire-9; PCL-5 = PTSD Checklist for DSM-5; CAGE-AID = CAGE Adapted to Include Drugs; AUDIT = Alcohol Use Disorders Identification Test; RSES-22 = Response to Stressful Experiences Scale

NH Other: NH Black, Native American Indian, Asian, Hawaiian Native/Pacific Islander, Mixed Race/Ethnicity

HS: high school; College degree = Associate's degree, Bachelor's degree; Graduate degree = Master's degree, Doctorate

Other: remarried, widowed

Note: Cases: those who experienced suicidal ideation at the baseline assessment (SBQ-R cutoff score of ≥7).
Controls: those who did not report experiencing suicidal ideation at the baseline assessment (SBQ-R score of <7).
Police shifts (approximate): Day = 07:00–15:00, Swing = 15:00–23:00, Graveyard = 23:00–7:00

Table 2 displays the bivariate odds of mental health score predictors on suicidality, stratified by FR subtype. All mental health assessments were significantly different across FR subtype. The GAD-7 was the only measure that did not have significant differences in the stratified odds. For LEOs, higher PHQ-9 score was associated with 1.10 (95% CI: 1.00, 1.21) times the odds of suicidality versus no suicidality, while FFs displayed 1.13 (95% CI: 1.01, 1.28) times the odds. PCL-5 scores were significant predictors of suicidality for two types of FRs, with 1.06 times the odds for LEOs (95% CI: 1.02, 1.11) and 1.05 times the odds for FFs (95% CI: 1.01, 1.09). LEOs also displayed that greater CAGE-AID and AUDIT scores were associated with increased odds of suicidality at 1.77 (95% CI: 1.13, 2.77) and 1.18 (95% CI: 1.05, 1.17), respectively. Finally, the scores of resilience measured by the RSES-22 were significant predictors of suicidality with 6% lower odds for both LEOs (OR = 0.94; 95% CI: 0.90, 0.99) and EMTs (OR = 0.94; 95% CI: 0.90, 0.99).

Figure 1 displays the relationship between mental health assessment scores and FR subtype in regard to suicidality. Each panel is a stratified analysis for a different mental health measure. Panel A displays that the higher the PTSD score, the higher the probability of suicidality. While EMTs have the highest probability throughout, the lines are parallel and confidence bands overlap indicating no statistical evidence of effect modification. Panel B displays substance use. Low substance abuse scores are correlated with the lowest probability of suicidality for LEOs. However, as substance use scores increase, the probability of suicidality increases at a higher rate for LEOs than for the other FRs. Panel C displays the alcohol consumption score. At the lower scores, EMTs and FFs show a significantly higher probability of suicidality compared with LEOs. At the highest alcohol consumption scores, FFs emerge as the group with a significantly lower probability of suicidality when compared with the other occupation groups. Finally, Panel D displays resiliency scores. Overall, the lowest resiliency scores show the highest probability of suicidality across all FR subtypes.

Table 2. *Bivariate[a] Odds of Suicidal Ideation, Stratified by First Responder Subtype*

| | | *Cases* | | |
	All (N = 224) OR (95% CI)	LEO (n = 93) OR (95% CI)	EMT (n = 64) OR (95% CI)	FF (n = 67) OR (95% CI)
Mental Health Measures				
GAD-7	1.05 (1.00, 1.11)[b]	1.08 (0.99, 1.19)	1.04 (0.94, 1.14)	1.06 (0.96, 1.17)
PHQ-9	1.10 (1.04, 1.17)[c]	1.10 (1.00, 1.21)[b]	1.09 (0.99, 1.20)	1.13 (1.01, 1.28)[b]
PCL-5	1.05 (1.02, 1.07)[c]	1.06 (1.02, 1.11)[b]	1.03 (1.00, 1.06)	1.05 (1.01, 1.09)[b]
CAGE-AID	1.45 (1.13, 1.86)[b]	1.77 (1.13, 2.77)[b]	1.11 (0.63, 1.96)	1.38 (0.95, 2.02)
AUDIT	1.07 (1.01, 1.13)[b]	1.18 (1.05, 1.35)[b]	1.05 (0.95, 1.17)	1.00 (0.90, 1.10)
RSES-22	0.95 (0.93, 0.98)[c]	0.94 (0.90, 0.99)[b]	0.94 (0.90, 0.99)[b]	0.97 (0.93, 1.01)

[a]Unconditional logistic regression model adjusted for age and gender.
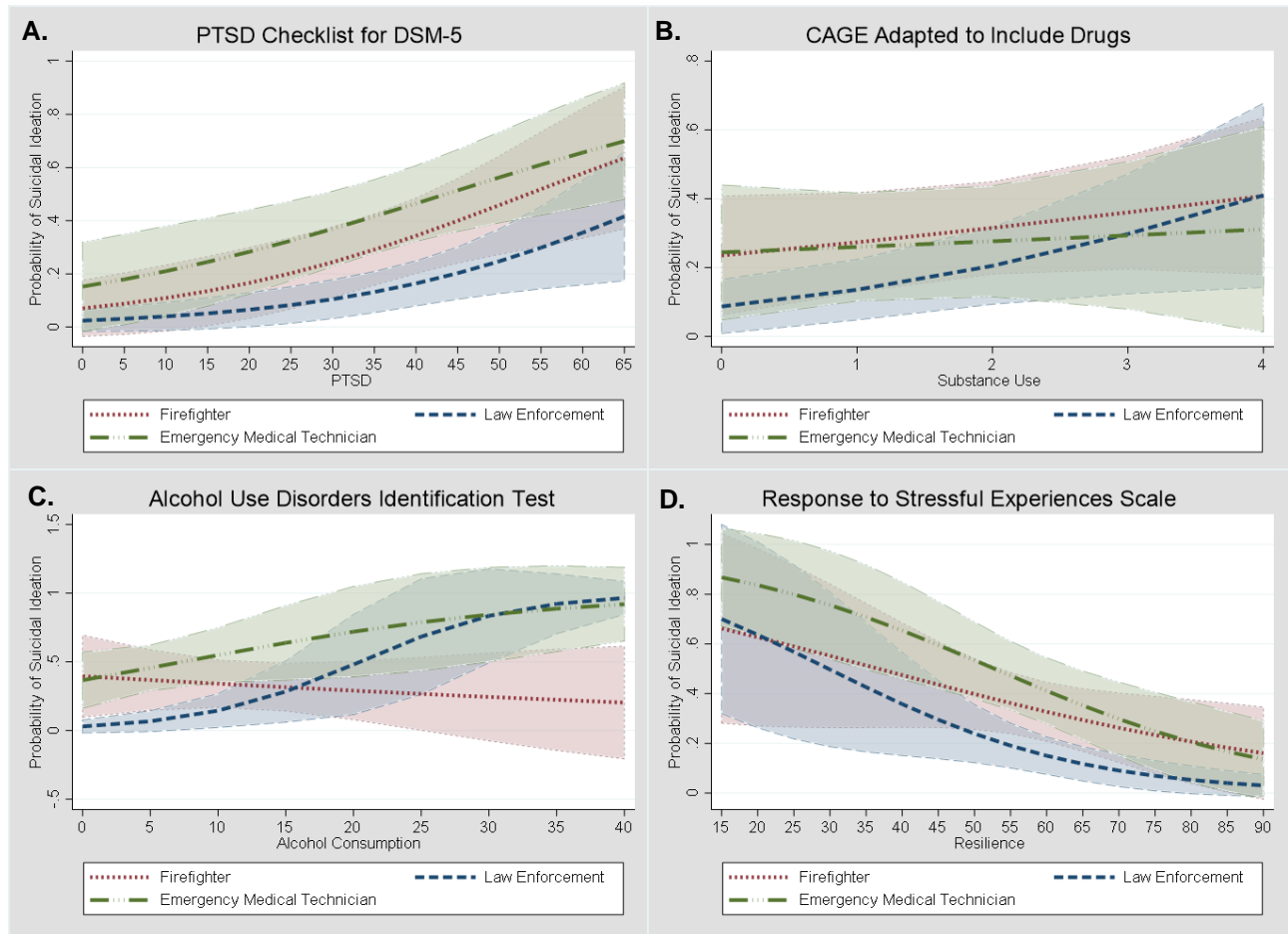LEO = law enforcement officer
EMT = emergency medical technician
FF = firefighter
OR: odds ratio; CI: confidence interval

[b]p value < 0.05.

[c]p value < 0.001.

Figure 1. *Predictive Margins of First Responder Type With 95% CIs*

Notes: Adjusted for age and gender.
Abbreviations: CI: confidence interval; PTSD= posttraumatic stress disorder; DSM-5 = *The Diagnostic and Statistical Manual of Mental Disorders*, 5th edition; CAGE = cut-annoyed-guilty-eye.

Discussion

Integration Into the Current Literature

In our current study, we sought to evaluate how mental health, personal traits, and professional characteristics may differ in influence and strength of association with suicidality across the FR occupational subtypes. The purpose of our study was to inform the comparability of predictors of suicidality across FR subtypes to better elucidate the most efficacious targets for intervention and clinical intercession. All standardized assessments were significantly associated with suicidality among certain FR subtypes. After delving into the odds of suicidality isolated by FR subtype (i.e., LEO, EMT, FF), some interesting trends were found. Specifically, among LEOs, depression, PTSD, and substance use were all significant predictors of greater odds of suicidality whereas generalized anxiety was not a significant predictor.

Additionally, resilience was a significant protective factor against suicidality for LEOs and EMTs. Among FFs, the only significant predictors of greater odds of suicidality were depression and PTSD. There was also indication that, among LEOs, resilience may exert the strongest influence to protect against suicidality. Our findings shed greater light into LEO dynamics in a treatment-seeking population. Of those who present for treatment at a mental health agency, clinicians should pay special attention to each unique subset of mental

health symptomology upon intake. This is consistent with prior research of LEOs where Stanley et al. (2016) concluded, "in determining the prevalence of suicide ideation among police officers (and other first responders) researchers are encouraged to use empirically-validated instruments" (p. 27).

A stratified look at FR subtype was also conducted for both substance use measures (CAGE-AID and AUDIT). Using a midsized police department, Violanti et al. (2011) found that male LEOs had significantly higher AUDIT scores than female LEOs. In a large FF and EMS sample, Martin et al. (2017) found that 31.2% of their sample screened positive for alcohol dependence. However, in their inferential models predicting lifetime suicidal attempts and lifetime suicidal ideation, alcohol dependence was not a statistically significant predictor whereas PTSD and depression were (Martin et al., 2017). Our results suggest that these measures may indeed provide value for clinicians in identifying FRs at risk of suicide.

Limitations

These results can be taken in light of several limitations. First, the assessments are cross-sectional at the baseline visit before being assigned their treating clinician, and therefore cannot be assumed to show temporal relationships indicative of causality. Next, the study population consists of only those FRs who have chosen to seek mental health services and is not representative of larger populations without elective mental healthcare. While the chosen population comes from a community mental health services agency, our study aimed to address issues of selection by using a case-control design. Not all of those in our study entered treatment with concerns of suicidality, our primary outcome, and those controls that were matched provided a decent representation of FRs without suicidal ideation. In our study, the sample size was small; however, the results provide guidance for risk and protective factors for future study. Finally, while many of the measurement scales used in our study come with suggested clinical cut scores, our study was limited to using these scales as continuous variables as the study was underpowered to use suggested cut scores.

Implications for Theory and Practice

Since the COVID-19 pandemic has adversely affected FRs' mental health (Carbajal et al., 2021) and an emotional coping approach has been efficacious (Cassiello-Robbins et al., 2021; Letica-Crepulja et al., 2021; Matto & Sullivan, 2021), a transdiagnostic treatment approach might be beneficial for trauma-exposed FRs. Our results are generally consistent with emotional dysregulation (Kotov et al., 2017) that might benefit from a Unified Protocol (O'Donnell et al., 2021) or neuroscience intervention (Ponder & Smith, 2021). This may be advantageous going forward to address clinician burnout, largely due to the COVID-19 pandemic, since the Unified Protocol has been adapted for use remotely, which might be beneficial for FRs due to their rotating shift work (Cassiello-Robbins et al., 2021).

Not to be overlooked are the findings concerning resilience in this sample of treatment-seeking FRs. For all FRs, resilience was a significant buffer against suicidality. Prior studies have shown that mindfulness-based resilience training may be efficacious among LEOs to address key physiological, psychological, and health risk factors (Christopher et al., 2018). Additionally, there are internet-delivered resilience training programs that are currently offered for EMTs, a platform that was created to increase access to this resource (Wild et al., 2018). Joyce et al. (2019) deduce that resilience is a modifiable risk factor among FRs that can buffer against PTSD and depression. Another finding worthy of future study was that those who were classified as experiencing suicidal ideation at baseline had higher scores indicative of more severe mental health problems and had lower self-reported resilience. This might suggest that FRs are *applying* or *activating* resilience, which was similar to other studies of this occupational group (Ponder et al., 2023; Shahan et al., 2022).

Conclusion

In conclusion, our findings suggest that while the mental health assessments were shown to be consistent predictors of suicide among all FRs, there are specific differences that may enable occupation-specific targets for mental health treatment. Clinicians serving this population can use these findings to provide psychoeducation in the beginning of treatment to build the therapeutic alliance so as to develop a collaborative treatment plan. We recommend that clinicians prioritize increasing resilience as a modifiable risk factor. Consequently, our study suggests that groups (e.g., clinicians, departments) heed the differences in the risk factors of suicidality across FR subtypes, rather than apply general intervention strategies.

References

Agnew, R. (2001). Building on the foundation of general strain theory: Specifying the types of strain most likely to lead to crime and delinquency. *Journal of Research in Crime and Delinquency*, *38*(4), 319–361. https://doi.org/10.1177/0022427801038004001

Ahmadi, A., Galusha, J. M., Ponder, W. N., Carbajal, J., Schuman, D. L., Whitworth, J., & Yockey, R. A. Validation of the PCL-5, PHQ-9, and GAD-7 in a sample of first responders. *Journal of Occupational and Environmental Medicine.* Advance online publication. https://doi.org/10.1097/JOM.0000000000002823

Beauchamp, A. M., & Jetelina, K. K. (2022). Effects of social and occupational stress, and physical strain on suicidal ideation among law enforcement officers. *Occupational Health Science*, *6*(1), 131–147. https://doi.org/10.1007/s41542-021-00103-7

Bennett, P., Williams, Y., Page, N., Hood, K., & Woollard, M. (2004). Levels of mental health problems among UK emergency ambulance workers. *Emergency Medicine Journal, 21,* 235–236. DOI: 10.1136/emj.2003.005645

Bishopp, S. A., & Boots, D. P. (2014). General strain theory, exposure to violence, and suicide ideation among police officers: A gendered approach. *Journal of Criminal Justice*, *42*(6), 538–548. https://doi.org/10.1016/j.jcrimjus.2014.09.007

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for *DSM-5* (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*(6), 489–498. https://doi.org/10.1002/jts.22059

Bond, A. E., & Anestis, M. D. (2021). Understanding capability and suicidal ideation among first responders. *Archives of Suicide Research*, 1–12. https://doi.org/10.1080/13811118.2021.1993397

Brown, R. L., Leonard, T., Saunders, L. A., & Papasouliotis, O. (1998). The prevalence and detection of substance use disorders among inpatients ages 18 to 49: An opportunity for prevention. *Preventive Medicine*, *27*(1), 101–110. https://doi.org/10.1006/pmed.1997.0250

Brown, R. L., & Rounds, L. A. (1995). Conjoint screening questionnaires for alcohol and other drug abuse: Criterion validity in a primary care practice. *Wisconsin Medical Journal*, *94*(3), 135–140. https://pubmed.ncbi.nlm.nih.gov/7778330/

Carbajal, J., Ponder, W. N., Malthaner, L. Q., Shahan, K., Jetelina, K. K., Galusha, J. M., & Schuman, D. L. (2022). Differences in attachment, resilience, and negative affect in non-treatment-seeking and treatment-seeking EMS professionals. *Journal of Social, Behavioral, and Health Sciences*, *16*(1), 103–116. DOI: 10.5590/JSBHA.2022.16.1.08

Carbajal, J., Ponder, W. N., Whitworth, J., Schuman, D. L., & Galusha, J. M. (2021). The impact of COVID-19 on first responders' resilience and attachment. *Journal of Human Behavior in the Social Environment*, *32*(6), 781–797. https://doi.org/10.1080/10911359.2021.1962777

Cassiello-Robbins, C., Rosenthal, M. Z., & Ammirati, R. J. (2021). Delivering transdiagnostic treatment over telehealth during the COVID-19 pandemic: Application of the Unified Protocol. *Cognitive and Behavioral Practice*, *28*(4), 555–572. https://doi.org/10.1016/j.cbpra.2021.04.007

Chopko, B. A., Palmieri, P. A., & Facemire, V. C. (2014). Prevalence and predictors of suicidal ideation among U.S. police officers. *Journal of Police and Criminal Psychology*, *29*(1), 1–9. https://doi.org/10.1007/s11896-013-9116-z

Christopher, M. S., Hunsinger, M., Goerling, R. J., Bowen, S., Rogers, B. S., Gross, C. R., Dapolonia, E., & Pruessner, J. C. (2018). Mindfulness-based resilience training to reduce health risk, stress reactivity,

and aggression among law enforcement officers: A feasibility and preliminary efficacy trial. *Psychiatry Research*, 264, 104–115. https://doi.org/10.1016/j.psychres.2018.03.059

Colorado Department of Public Health & Environment, Jamison, E., Herndon, K., Bui, A. G., & Bol, K. (2015, December). *Suicide among first responders in Colorado, 2004–2014: A summary from the Colorado Violent Death Reporting System* (No. 97). Colorado Violent Death Reporting System, Vital Statistics Program. https://www.cohealthdata.dphe.state.co.us/chd/Resources/pubs/Suicide%20in%20Colorado%20First%20Responders.pdf

Donnelly, E. A., & Bennett, M. (2014). Development of a critical incident stress inventory for the emergency medical services. *Traumatology: An International Journal, 20*(1), 1–8. https://doi.org/10.1177/1534765613496646

Gist, R., Taylor, V. H., & Raak, S. (2011). *Suicide surveillance, prevention, and intervention measures for the US fire service. Findings and recommendations for the suicide and depression summit*. National Fallen Firefighters Foundation. http://www.tkolb.net/FireReports/2012/suicide_whitepaper.pdf

Jetelina, K. K., Molsberry, R. J., Gonzalez, J. R., Beauchamp, A. M., & Hall, T. (2020). Prevalence of mental illness and mental health care use among police officers. *JAMA Network Open*, *3*(10), e2019658. https://doi.org/10.1001/jamanetworkopen.2020.19658

Johnson, D. C., Polusny, M. A., Erbes, C. R., King, D., King, L., Litz, B. T., Schnurr, P. P., Friedman, M., Pietrzak, R. H., & Southwick, S. M. (2011). Development and initial validation of the Response to Stressful Experiences Scale. *Military Medicine, 176*(2), 161–169. http://dx.doi.org/10.7205/milmed-d-10-00258

Joiner, T. (2007). *Why people die by suicide*. Harvard University Press.

Jones, S., Nagel, C., McSweeney, J., & Curran, G. (2018). Prevalence and correlates of psychiatric symptoms among first responders in a southern state. *Archives of Psychiatric Nursing*, *32*, 828–835. https://doi.org/10.1016/j.apnu.2018.06.007

Joyce, S., Tan, L., Shand, F., Bryant, R. A., & Harvey, S. B. (2019). Can resilience be measured and used to predict mental health symptomology among first responders exposed to repeated trauma? *Journal of Occupational and Environmental Medicine*, *61*(4), 285–292. https://doi.org/10.1097/JOM.0000000000001526

Kleim, B., & Westphal, M. (2011). Mental health in first responders: A review and recommendation for prevention and intervention strategies. *Traumatology*, *17*(4), 17–24. https://doi.org/10.1177/1534765611429079

Klimley, K. E., Van Hasselt, V. C., & Stripling, A. M. (2018). Posttraumatic stress disorder in police, firefighters, and emergency dispatchers. *Aggression and Violent Behavior*, *43*, 33–44. http://dx.doi.org/10.1016/j.avb.2018.08.005

Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., Brown, T. A., Carpenter, W. T., Caspi, A., Clark, L. A., Eaton, N. R., Forbes, M. K., Forbush, K. T., Goldberg, D., Hasin, D., Hyman, S. E., Ivanova, M. Y., Lynam, D. R., Markon, K., . . . Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology*, *126*(4), 454–477. https://doi.org/10.1037/abn0000258

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Letica-Crepulja, M., Stevanović, A., Grković, J., Rončević-Gržeta, I., Jovanović, N., & Frančišković, T. (2021). Posttraumatic stress disorder symptoms and coping with the lockdown among help-seeking veterans before and during the COVID-19 pandemic. *Croatian Medical Journal*, *62*(3), 241–249. https://doi.org/10.3325/cmj.2021.62.241

Martin, C. E., Tran, J. K., & Buser, S. J. (2017). Correlates of suicidality in firefighter/EMS personnel. *Journal of Affective Disorders*, *208*, 177–183. http://dx.doi.org/10.1016/j.jad.2016.08.078

Matto, H. C., & Sullivan, K. (2021). Ashes2Art: Mitigation strategies for short- and long-term distress in emergency service personnel during COVID-19. *Clinical Social Work Journal*, *49*, 437–444. https://doi.org/10.1007/s10615-021-00797-w

McCraty, R., & Atkinson, M. (2012). Resilience training program reduces physiological and psychological stress in police officers. *Global Advances in Health and Medicine*, *1*(5), 44–66. https://doi.org/10.7453/gahmj.2012.1.5.013

O'Donnell, M. L., Lau, W., Chisholm, K., Agathos, J., Little, J., Terhaag, S., Brand, R., Putica, A., Holmes, A. C. N., Katona, L., Felmingham, K. L., Murray, K., Hosseiny, F., & Gallagher, M. W. (2021). A pilot study of the efficacy of the unified protocol for transdiagnostic treatment of emotional disorders in treating posttraumatic psychopathology: A randomized controlled trial. *Journal of Traumatic Stress*, *34*(3), 563–574. https://doi.org/10.1002/jts.22650

Osman, A., Bagge, C. L., Gutierrez, P. M., Konick, L. C., Kopper, B. A., & Barrios, F. X. (2001). The suicidal behaviors questionnaire-revised (SBQ-R): Validation with clinical and nonclinical samples. *Assessment*, *8*(4), 443–454. https://doi.org/10.1177/107319110100800409

Palomino, A., Leamon, M., & Henderson, S. L. (2012). Substance use disorders—Stimulants and opioids. In R. M. McCarron, G. L. Xiong, & J. Bourgeois (Eds.), *Lippincott's Primary Care Psychiatry: For primary care clinicians and trainees, medical specialists, neurologists, emergency medical professionals, mental health providers, and trainees* (pp. 103–116). Lippincott Williams & Wilkins.

Ponder, W. N., Beauchamp, A. M., Schuman, D. L., Carbajal, J., Jetelina, K. K., & Galusha, J. M. (2022). Differences in suicidality in non-treatment-seeking and treatment-seeking law enforcement officers: A cross-sectional study. *Journal of Occupational and Environmental Medicine*, *64*(9), 797–801. http://doi.org/10.1097/JOM.0000000000002618

Ponder, W. N., Prosek, E. A., & Sherrill, T. (2021). Validation of the adapted response to stressful experiences scale (RSES-4) among first responders. *The Professional Counselor*, *11*(3), 300–312. https://doi.org/10.15241/wnp.11.3.300

Ponder, W. N., & Smith, S. (2021). Can neuroscience repair insecure attachment? *Journal of Military and Government Counseling*, *9*(2), 31–56. https://mgcaonline.org/wp-content/uploads/2022/01/JMGC-Vol-9-Is-2.pdf#page=36

Ponder, W. N., Walters, K., Simons, J. S., Simons, R. M., Jetelina, K. K., & Carbajal, J. (2023). Network analysis of distress, suicidality, and resilience in a treatment seeking sample of first responders. *Journal of Affective Disorders*, *320*, 742–750. https://doi.org/10.1016/j.jad.2022.09.097

Ramey, S. L., Perkhounkova, Y., Hein, M., Bohr, N. L., & Anderson, A. (2017). Testing a resilience training program in police recruits: A pilot study. *Biological Research for Nursing*, *19*(4), 440–449. https://doi.org/10.1177/1099800417699879

Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, *88*(6), 791–804. https://doi.org/10.1111/j.1360-0443.1993.tb02093.x

Shahan, K., Ponder, W. N., Malthaner, L. A., Jetelina, K. K., Schuman, D. L., & Carbajal, J. (2022). Resilience measured as an outcome variable in a sample of emergency medical service (EMS) professionals. *Abuse: An International Impact Journal*, *3*(1), 12–21. https://doi.org/10.37576/abuse.2022.028

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder (The GAD-7). *Archives of Internal Medicine, 166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

Stanley, I. H., Hom, M. A., & Joiner, T. E. (2016). A systematic review of suicidal thoughts and behaviors among police officers, firefighters, EMTs, and paramedics. *Clinical Psychology Review*, *44,* 25–44. http://dx.doi.org/10.1016/j.cpr.2015.12.002

Steyn, R., Vawda, G. N., Wyatt, E., & Williams, J. K. (2013). Posttraumatic stress disorder diagnostic criteria and suicidal ideation in a South African police sample. *African Journal of Psychiatry*, *16*(1), 19–22. https://hdl.handle.net/10520/EJC130541

Stuart, H. (2008). Suicidality among police. *Current Opinion in Psychiatry*, *21*(5), 505–509. https://doi.org/10.1097/YCO.0b013e328305e4c1

Tuckey, M. R., & Scott, J. E. (2014). Group critical incident stress debriefing with emergency services personnel: A randomized controlled trial. *Anxiety Stress & Coping*, *27*(1), 38–54. https://doi.org/10.1080/10615806.2013.809421

U.S. Fire Administration. (2022). *Texas Fire Loss And Fire Department profile*. https://www.usfa.fema.gov/statistics/states/texas.html

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The interpersonal theory of suicide. *Psychological Review*, *117*(2), 575–600. https://doi.org/10.1037/a0018697

Violanti, J. M., Charles, L. E., Hartley, T. A., Mnatsakanova, A., Andrew, M. E., Fekedulegn, D., Vila, B., & Burchfiel, C. M. (2008). Shift-work and suicide ideation among police officers. *American Journal of Industrial Medicine*, *51*(10), 758–768. https://doi.org/10.1002/ajim.20629

Violanti, J. M., Fekedulegn, D., Charles, L. E., Andrew, M. E., Hartley, T. A., Mnatsakanova, A., & Burchfiel, C. M. (2009). Suicide in police work: Exploring potential contributing influences. *American Journal of Criminal Justice*, *34*(1–2), 41–53. https://doi.org/10.1007/s12103-008-9049-8

Violanti, J. M., & Gehrke, A. (2004). Police trauma encounters: Precursors of compassion fatigue. *International Journal of Emergency Mental Health*, *6*(2), 75–80. https://pubmed.ncbi.nlm.nih.gov/15298078/

Violanti, J. M., Owens, S. L., McCanlies, E., Fekedulegn, D., & Andrew, M. E. (2019). Law enforcement suicide: A review. *Policing: An International Journal*, *42*(2), 141–164. https://doi.org/10.1108/PIJPSM-05-2017-0061

Violanti, J. M., Slaven, J. E., Charles, L. E., Burchfiel, C. M., Andrew, M. E., & Homish, G. G. (2011). Police and alcohol use: A descriptive analysis and association with stress outcomes. *American Journal of Criminal Justice*, *36*, 344–356. https://doi.org/10.1007/s12103-011-9121-7

Weiss, D. S., Brunet, A., Best, S. R., Metzler, T. J., Liberman, A., Pole, N., Fagan, J. A., & Marmar, C. R. (2010). Frequency and severity approaches to indexing exposure to trauma: The Critical Incident History Questionnaire for police officers. *Journal of Traumatic Stress*, *23*(6), 734–743. http://dx.doi.org/10.1002/jts.20576

Wild, J., El-Salahi, S., & Esposti, M. D. (2020). The effectiveness of interventions aimed at improving well-being and resilience to stress in first responders: A systematic review. *European Psychologist*, *25*(4), 252–271. http://dx.doi.org/10.1027/1016-9040/a000402

Wild, J., El-Salahi, S., Tyson, G., Lorenz, H., Pariante, C. M., Danese, A., Tsiachristas, A., Watkins, E., Middleton, B., Blaber, A., & Ehlers, A. (2018). Preventing PTSD, depression and associated health problems in student paramedics: Protocol for PREVENT-PTSD, a randomised controlled trial of supported online cognitive training for resilience versus alternative online training and standard practice. *BMJ Open*, *8*(12), e022292. https://doi.org/10.1136/bmjopen-2018-022292