Factors influencing first responders’ mental health during COVID-19

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ABSTRACT
As the world adapts to the coronavirus-2019 (COVID-19) pandemic, healthcare professionals have been performing lifesaving medical interventions under intensely stressful conditions. First responders are a subset of this population that experience traumatic emergency situations daily while working in hazardous conditions during COVID-19. Past studies on first responders’ mental health have reported that post-traumatic stress disorder (PTSD) and suicidality are higher than anticipated in this population. In order to understand the factors influencing mental health in first responders during COVID-19, a survey was distributed to a convenience sample of 415 emergency responders from across the country. This survey addressed the influence of demographics and COVID-19 on cumulative PTSD and stress scores; 67 percent of survey respondents indicated that they knew another first responder who has contemplated or committed suicide, with 11 percent of respondents indicating that they themselves have suicidal tendencies. The results determined a variety of factors that influence mental health in first responders including age, gender, diagnosis of a previous mental health disorder, and career vs. volunteer departments. This study emphasizes the role that government funding plays in ensuring mental health resource access for first responders. Furthermore, this study has revealed that improved agency safeguards against COVID-19 can help reduce stress in emergency services personnel during this pandemic.

Key words: COVID-19, pandemic, first responder, mental health

INTRODUCTION
Mental health consequences in first responders are a seriously under-reported issue. Each year, more firefighters die by suicide than in the line of duty. Studies examining first responder suicidality have found that as many as 46 percent of surveyed first responders have contemplated suicide at some time and 15 percent had actually attempted. Post-traumatic stress disorder (PTSD) rates in first responders are also much higher than those portrayed by the society. Mental health resources are often inaccessible for rural or under-funded emergency services departments, further exacerbating this issue.

With first responders under increasing demand during the coronavirus-2019 (COVID-19) pandemic, mental health consequences are likely to be exaggerated. No studies have yet examined the influence of COVID-19 on first responders’ mental health. This study aimed to understand the factors influencing the mental health in first responders, with an emphasis on COVID-19-induced stressors. It was anticipated that demographics such as gender and age could influence stress levels in first responders. Furthermore, it was predicted that high stress scores could be influenced by one’s fear of contracting or spreading COVID-19. Finally, this study aimed to understand the perceptions surrounding mental health resources and COVID-19 safeguards at emergency services institutions around the country.

METHODS
A survey was distributed to a convenience sample of 415 first responders located throughout the United
States. The distribution of this survey occurred over social media and through specific department distribution lists. All participants were over the age of 18 and consented to the research objectives. The survey consisted of four sections: demographics, PTSD evaluation, COVID-specific questions, and an open-ended section.

Demographics

The average age of the 415 respondents was 31.35 years, with a standard deviation of 11.74 years. This study had a diverse range of respondents from 18 to 73 years of age. Approximately 48 percent of respondents were male and 52 percent were female. Participants responded to questions pertaining to their field of emergency services (fire / EMS / law), as well as the number of years served and type of department (career / volunteer / combination). Next, participants were asked if they have ever been diagnosed with a mental health disorder at some point in their life. Finally, participants were asked if they have ever known another first responder who has struggled with suicidal ideations or committed suicide.

PTSD score

DSM-IV criteria were utilized to create questions relevant to the diagnosis of PTSD. Eight questions utilized a Likert scale to quantify the occurrence of each symptom with 1 indicating “never” and 5 as “always”. Participants were asked to rank the occurrence of the following events related to stressful emergency calls: disturbing memories, vivid flashbacks, feeling jumpy, feeling upset when recalling events, physical responses, eg, sweating, shaking, crying, etc, suppressing stressful memories, and avoiding activities related to a call. The total PTSD score was a cumulative result of all eight questions, with a minimum score of 8 and a maximum score of 40.

COVID-19 section

In order to understand the implications of COVID-19 on first responders, participants were asked to rank their agreement with the statement “when working/volunteering as a first responder I fear spreading COVID-19 to others (including family members or members of my community)” from 1 (strongly disagree) to 5 (strongly agree). To understand the influence of agency resources on mental health in first responders, respondents were asked to rank the statement “I feel my department has mental health resources readily available should I need them” from 1 (strongly disagree) to 5 (strongly agree). Additionally, respondents were asked to rank the statement “my fire, EMS, or law agency has a plan or safeguards in place for COVID-19” from 1 (strongly disagree) to 5 (strongly agree).

Next, participants were asked about their activity in the emergency services since the onset of COVID-19. Specifically, they were asked to rank the statement “my participation in the emergency services has declined since the start of COVID-19” from 1 (strongly disagree) to 5 (strongly agree). Finally, in order to understand the implications of COVID-19 on physical health, participants were asked to rank the statement “since the onset of COVID-19, I have had more difficulty falling asleep, persistent nightmares, or trouble staying asleep” from 1 (strongly disagree) to 5 (strongly agree).

COVID-induced stress score

In order to understand how COVID-19 has influenced mental health in first responders, participants were asked to denote if any of the following symptoms have increased since the onset of COVID-19: little interest or pleasure in doing things; trouble falling asleep; feeling tired or “down”; poor appetite; feeling depressed, overwhelmed, or hopeless; or thoughts that you would be better off dead. With six possible options, a cumulative score was given for each symptom noted by the participant. Therefore, the minimum possible COVID-induced stress score was 0 and the maximum score was 6.

Statistical analysis

Data were analyzed using IBM-SPSS statistical packages. Quantitative variables were described
using descriptive statistics, whereas categorical variables were described using frequencies. For any categorical outcome variables, binary logistic regression was utilized for analysis purposes. For any quantitative outcome variables, linear logistic regression was utilized. Analysis began with simple regression, followed by multiple regression for any relevant covariates. Throughout the study, significance is defined as p < 0.05.

RESULTS

Demographics

Of the 415 participants, approximately 42.3 percent of respondents were engaged in fire/rescue and 89.9 percent of respondents were engaged in EMS of some kind. Only 3.7 percent of respondents reported involvement in law enforcement and 0.8 percent of respondents self-reported as 911 dispatchers. The average participant reported around 9 years of emergency services experience, with a standard deviation of 9.8 years. Linear regression results determined that women, on average, had around 3 years less time as a first responder than men (B = −2.772, 95% CI from −4.59 to −0.59, p = 0.003). 20.8 percent of respondents were volunteer emergency responders, 47.1 percent were career first responders, and 32.1 percent of respondents were both volunteer and career involved. Surprisingly, 67.6 percent of participants knew another first responder struggling with suicidal ideations or who had committed suicide. Furthermore, 42.2 percent of respondents had been previously diagnosed with a mental health disorder. Of those, women were approximately four times more likely to be diagnosed with a mental health disorder than men (OR = 3.958, 95% CI from 2.6 to 6.0, p < 0.001).

PTSD score

There were a variety of factors influencing PTSD scores in the first responders surveyed. Age significantly influenced the PTSD score, such that as one aged, they were more likely to report a lower PTSD score (B = −0.061, 95% CI from −0.107 to −0.015, p = 0.01). Gender also influenced the PTSD score, such that women were significantly more likely to have a higher PTSD score than men (B = 1.392, 95% CI from 0.296 to 2.488, p = 0.013). The department in which a participant served significantly influenced the PTSD score, such that career firefighters were significantly more likely to report a higher PTSD score (B = −1.323, 95% CI from −0.635 to −2.010, p < 0.001). Having a previous mental health disorder diagnosis also significantly influenced the PTSD score, such that those with a mental health disorder had significantly higher PTSD scores by almost 4 points (B = 3.816, 95% CI from 2.777 to 4.856, p < 0.001). Interestingly, the total number of years an individual served as an emergency responder did not significantly influence the PTSD score (B = 0.025, p = 0.375).

COVID-specific questions

All COVID-specific questions were ranked on a scale of 1–5, with 1 being the individual strongly disagrees with the statement and 5 being the individual strongly agrees with the statement. Participants’ fear of contracting COVID-19 had a fairly even distribution with an average of 2.93 (Figure 1). Gender did influence the fear of contracting COVID-19, such that women were significantly more likely to report higher fear of contracting COVID than men (B = 0.424, 95% CI from 0.159 to 0.689, p = 0.002). Career first responders were significantly more likely to report greater fear of contracting COVID than their volunteer counterparts (B = −0.188, 95% CI from −0.357 to −0.018, p = 0.03). Data also showed that those who felt their department had stronger COVID-19 safeguards in place had a trend toward lower fear of contracting COVID-19; however, this finding was not statistically significant (B = −0.107 p = 0.066). There was no significant influence of age on this finding (p = 0.292).

Participants’ fear of spreading COVID-19 had an average of 3.92, indicating that the average individual did fear spreading COVID to others (Figure 2). Fear of spreading COVID to others was influenced by gender, such that women were more likely to fear spreading the disease to others (B = 0.551, 95% CI 0.304 to 0.797, p < 0.001). Interestingly, age also played a role, such that older individuals were less likely to fear spreading COVID-19 to
Figure 1. When working or volunteering as an emergency responder, I fear contracting COVID-19.

Figure 2. When working or volunteering as an emergency responder, I fear spreading COVID-19 to others (including family members or members of my community).

others (B = −0.017, 95% CI from −0.028 to −0.007, p = 0.002). There was also a significant influence of COVID agency safeguards, such that responders who felt their agency had stronger safeguards in place had less fear of spreading COVID to others (B = −0.150, 95% CI from −0.258 to −0.042, p = 0.006).

When examining participants' perception of their agency's COVID-19 safeguards, the distribution was skewed strongly to the right with an
average of 4.1, indicating that most individuals felt their departments had some COVID safeguards or a plan in place (Figure 3). However, participants’ perception of their agency’s mental health resources was less skewed, with an average of 3.10 (Figure 4). Not surprisingly, these two findings influenced each other, such that departments with limited access to mental health resources also had limited COVID-19 safeguards in place (B = 0.381, 95% CI from 0.313 to 0.448, p < 0.001). Interestingly, volunteer first responders were more likely to perceive better COVID agency safeguards than their career counterparts (B = 0.259, 95% CI from 0.117 to 0.401, p < 0.001). There was also a trend toward volunteers perceiving better mental health resources; however, this was not a statistically significant finding (p = 0.07). PTSD scores did influence the perception of agency resources, such that those with higher PTSD scores reported more limited access to mental health resources (B = −0.056, 95% CI from −0.081 to −0.031, p < 0.001).

When examining first responders’ activity in the emergency services since the onset of COVID-19, the average was 1.8, indicating that most individuals have not declined their participation (Figure 5). However, volunteer first responders were significantly more likely to report a decline in participation since the onset of COVID-19 (B = 0.164, 95% CI from 0.002 to 0.326, p = 0.047). Those with higher PTSD scores were more likely to report less participation in the emergency services since the onset of COVID-19 (B = 0.026, 95% CI from 0.003 to 0.049, p = 0.024). Furthermore, agency COVID-19 safeguards influenced this finding, such that those working at a department with limited COVID safeguards reported lower participation in the emergency services (B = −0.117, 95% CI from −0.225 to −0.008, p = 0.035).

Examining the influence of COVID-19 on physical indicators of health, in this case sleep, the average participant reported little change in sleep behaviors (Figure 6). However, there were many factors influencing this finding. Age was a significant factor, such that younger individuals had increased difficulty sleeping since the onset of COVID (B = −0.015, 95% CI from −0.027 to −0.003, p = 0.018). Gender also significantly influenced this finding, such that women were significantly more likely to report sleeping challenges since the onset of COVID-19 (B = 0.656, 95% CI from 0.375 to 0.936, p < 0.001). Career first responders reported

Figure 3. My fire, EMS, or law agency has a plan or safeguards in place for COVID-19.

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significantly more changes in sleep behaviors than their volunteer counterparts ($B = -0.214$, 95% CI from $-0.395$ to $-0.34$, $p = 0.02$). Furthermore, having been diagnosed with a mental health disorder, having a high PTSD score, or having a high number of COVID-19-induced stress symptoms were all significantly correlated with worse sleep since the onset of COVID-19.

Finally, examining the number of COVID-induced stress symptoms, the average participant reported two symptoms (Figure 7). This study found that around 11 percent of respondents had suicidal
thoughts or ideations. Females were more likely to report higher COVID-induced stress than males (B = 0.829, 95% CI from 0.491 to 1.16, p < 0.001). Total years as a first responder did influence COVID-induced stress scores, such that those who have been in the emergency services longer reported lower stress (B = −0.028, 95% CI from −0.046 to −0.011, p = 0.001). This finding was not influenced by age; however, independently age did influence COVID-induced stress scores, such that those who were older reported lower stress (B = −0.034, 95% CI from −0.049 to −0.020, p < 0.001). Having been diagnosed with a mental health disorder was also associated with significantly higher COVID-induced stress scores (B = 1.172, 95% CI from 0.843 to 1.501, p < 0.001). Furthermore, those reporting worse sleep since COVID reported higher stress scores (B = 0.779, 95% CI from 0.689 to 0.868, p < 0.001). Finally, career first responders reported significantly more COVID-induced stressors than their volunteer counterparts (B = −0.365, 95% CI from −0.583 to −0.148, p = 0.001).

Open-ended responses

One hundred participants elected to give optional additional information on the topic of the study in the open-ended section. Of these responses, there were a few distinguishable categories that consisted of the following topics: burnout, finances, management, and trauma.

Burnout: Data revealed that emergency responders are feeling exhausted and burnout since the onset of COVID-19. Many respondents reported feeling exhausted, tired, overworked, burned out, or understaffed. One emergency medical technician (EMT) put it well when she said, “During this time it’s hard not to feel alone, especially when we can’t be around our family as first responders because we’re scared of giving them COVID. It’s a dark time and I know a lot of us feel alone.” Another EMT explained she is working in EMS to put herself through nursing school, but the pandemic has made this increasingly challenging and has left her exhausted trying to balance these aspects of her life. Another EMT reported that the time in isolation during the pandemic has made their anxiety and depression worse, which is impacting their overall well-being. One law enforcement officer reported that the recent lack of community support has made doing his job increasingly exhausting and unfulfilling.

Figure 6. Since the onset of COVID-19, I have had more difficulty falling asleep, persistent nightmares, or trouble staying asleep.

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Finances: Money was also a significant stressor for respondents with many participants reporting feeling underpaid, underfunded, and living paycheck to paycheck. One firefighter/EMT voiced his opinion saying, “Difficult to continue doing a job that I love with little pay. My other job fell apart with COVID, so it caused a ton of stress that I couldn’t get assistance and our government spent all of their time bickering, instead of helping.” One EMT explained that her fear of contracting COVID was not due to the illness itself, but the fear of losing two weeks of pay. Another EMT explained that “nothing is worse than putting yourself and your family at risk every day, and the people at Target or fast-food places make more than you. We didn’t get a hazard pay and we see death every day.”

Management: Issues with agency management were often cited, with many individuals feeling departments fail to offer adequate mental health services or proper training. One paramedic voiced her concerns saying, “The community support has vanished. We are now bodies in the line of infection. Constantly offering over time instead of hiring new people and managers ignoring our requests for changes to protocols.” Another respondent explained that the lack of large-scale awareness for mental health challenges in first responders is frustrating. Multiple individuals explained their short-staffed departments cannot find new hires, which means the existing staff work constantly and thus, their well-being is harmed. One paramedic voiced his view on the broken EMS management system explaining, “Employers disregard the mental health of their employees regularly, but I feel as though it’s worse now because alcoholism and drug use is now swept under the rug to keep employees performing the duties.” Other individuals explained that they are hesitant to seek mental health services because employers keep permanent files of this information, which could harm their career. One EMT at a private ambulance company told the story of her career and how critical it was that she found an organization with management that actually listened to issues and found solutions to problems.

Trauma: Finally, death and emotional trauma were a significant source of stress for responders. Multiple EMTs and firefighters reported having contracted COVID-19 from emergency calls and feeling increased stress due to that diagnosis. Others cited
losing family members or partners with a lack of support system to deal with these issues. One impactful response received told the story of a 40 year old emergency responder who said, “I had COVID-19 in August... my partner died today from COVID... in my small rural department one of our oldest serving officers (27 years on the job) died of COVID 5 days ago. His mother caught it from him and died this morning. Two of his other relatives are in the same ICU on a ventilator. All of these originating from that officer going on a routine call at what was later determined to be a COVID-positive house.” This is only a snapshot of the consequences of COVID-19 on first responders’ lives.

DISCUSSION
Factors affecting first responders’ mental health during COVID-19

First responders’ mental health challenges are serious and under-reported consequences of this stressful job. This study found that approximately 67 percent of respondents knew another first responder who has struggled with suicidal ideations and 11 percent of the respondents in this study have contemplated suicide at some point. Yet, this startling figure is likely under-reporting the true proportion of first responders who have struggled with mental health challenges. Furthermore, this study has shown that those already diagnosed with mental health disorders are at a greater risk for PTSD, increased stress, and worse sleep as a result of COVID-19, in comparison to colleagues without a mental health disorder.

There are a variety of factors influencing first responders’ mental health. As shown in this study, gender, age, and previous mental health diagnosis significantly altered the propensity for PTSD and COVID-induced stress. Women were more likely to report increased stress levels, higher PTSD scores, and worse sleep as a result of COVID-19, in comparison to colleagues without a mental health disorder.

Addressing the problem

First responders’ mental health should be prioritized at the state and federal levels. Funding disparities across the country result in limited access to comprehensive mental health services for first responders. Although some organizations may obtain funding to start a mental health resource program, often these organizations find the funds insufficient for long-term maintenance of these crucial resources. In order to cultivate an effective prevention and treatment program, funding should be allocated to ensure longevity of these resources. Mental health treatment and prevention programs tailored to first responders may also improve participation in comparison to generic suicide hotlines. Stigmatization of mental health is a challenging barrier for first responders’ well-being, but by promoting these changes at the state and federal levels, responders will have improved access to lifesaving resources.

According to recent data from the US Health Resources & Services Administration, over 121 million Americans live in an area containing too
few mental health providers and services, designated as a health professional shortage area. This means first responders working in these areas are going to have limited access to mental health professionals capable of treating the consequences of this stressful and traumatic career. Differences in local, state, and federal funding can further contribute to disparities in mental health resource access. Departments in more rural locations, or those in underfunded cities, likely have greater challenges providing these critical services to their employees, and, therefore, many first responders will not seek treatment due to the financial consequences. It is recommended that all emergency services departments budget mental health resource access for employees, which should be subsidized at the state and federal levels. Finally, it is recommended that all state and local governments be required to establish a Critical Incident Stress Management (CISM) team that focuses on intervention strategies following stressful and traumatic emergency situations.

To reduce burnout and improve job satisfaction, governments and employers should consider increased pay for first responders. As evident in the open-ended responses of the Results section, finances were a significant source of stress for first responders all over the country. Currently, there is no national pay standard for first responders, and there is no established hazard pay for first responders during COVID-19. As it stands, departments are only required to pay their employees federal minimum wage, at $7.25 an hour. Dialogue at the local, state, and federal levels should focus on improving these wage disparities and finding increased relief packages for emergency services personnel harmed by COVID-19.

Public safety agencies should also prioritize COVID-19 planning and safeguard execution to protect employees and community members. As shown in this study, emergency responders who felt their agencies did not have a plan or safeguards in place in response to COVID-19 had greater fear of contracting and spreading the virus to others. Consequently, these same individuals were more likely to report a significant decline in participation in emergency services, whether that be volunteer or career departments. Departments that lacked adequate COVID safeguards also lacked adequate mental health resources. This indicates the issue is likely either with the management or with funding deficits. Interestingly, this study showed that volunteer first responders were more likely to perceive better COVID-19 safeguards than career first responders. Additionally, a trend was observed for volunteers perceiving better mental health resources than their career counterparts. This finding goes against previously observed trends showing career departments having greater funding and being better able to provide mental health services for their employees.

Local governments and public policy makers should acknowledge differences between career and volunteer first responders’ mental health. As indicated in this study, statistically significant differences were observed in the mental health screening questions utilized. Career first responders had higher PTSD scores, greater fear of contracting COVID-19, more sleep problems as a result of COVID, and greater COVID-induced stressors. The mental health consequences seen in career first responders contradict some past studies, which have seen volunteer first responders with worse mental health outcomes. Future studies should investigate the role of geographic location on mental health outcomes in first responders.

Despite the increased mental health consequences in career first responders during COVID-19, this study showed that volunteer first responders reported a significantly higher decline in participation in emergency services since the onset of COVID. This could be due to their lack of financial investment as volunteers and, therefore, not as significant an obligation to continue giving time under hazardous conditions. Furthermore, it is known that volunteer first responders are more likely to know their patients due to the small community environment, which could be a unique challenge influencing this outcome. It is also possible that work–life balance in volunteer first responders has been further challenging as a result of COVID-19, which could be
contributing to the declining participation observed in this study.

There are some limitations with this study that should be addressed and corrected in future work. This study was based on a convenience sample of first responders from across the country recruited by social media. Therefore, this study potentially attracted individuals who had stronger feelings about first responders’ mental health during COVID-19.

Furthermore, only around 4 percent of survey respondents were law enforcement personnel. As a result of this low representation, it is possible that this study’s findings may not apply to this subset of public safety personnel. Future work should focus on recruiting an equal sample of EMS, fire and law. There are many other factors that influence mental health that were not explored in this study. Future work should examine the role of race/ethnicity, SES, and geographic location, with a focus on physical indicators of health. It is likely that physical activity, diet, hormonal imbalances, and genetics could be influencing the findings of this study.


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