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Cross-Sectional Study on the Prevalence of PTSD Symptoms Among First Responders

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ABSTRACT
First responders, including police officers, firefighters and emergency medical personnel, frequently encounter traumatic events that put them at significant risk for developing Post-Traumatic Stress Disorder (PTSD). This study aimed to determine the prevalence and severity of PTSD symptoms among first responders and to identify associated demographic, occupational and support system factors. A cross-sectional study was conducted with a sample size of 200 active-duty first responders from urban and suburban emergency services. Data were collected using validated PTSD symptom questionnaires and the severity of symptoms was categorized into mild, moderate and severe. Demographic and occupational factors, as well as mental health support utilization, were analyzed. Statistical significance was assessed using appropriate tests with a significance threshold of $P<0.05$. PTSD symptoms were present in 43.5% of participants, with 22.5% exhibiting mild symptoms, 15.0% moderate symptoms and 6.0% severe symptoms. Mid-career first responders (age 30-50 years) had the highest prevalence (46.0%) and police personnel demonstrated a significantly higher risk (45.0%, $P<0.01$) compared to firefighters and EMS personnel. Despite the high prevalence, 40.0% of participants reported no engagement with mental health support systems. This study highlights the significant psychological burden of PTSD among first responders, particularly mid-career professionals and police personnel. The findings underscore the urgent need for accessible mental health interventions, routine screenings and stigma-reduction initiatives to improve mental well-being and resilience in this critical workforce.

INTRODUCTION

The profound impact of trauma exposure on first responders, encompassing police officers, firefighters, and emergency medical services (EMS) personnel, is a growing concern within mental health disciplines. First responders are on the front lines of emergencies, often facing situations that expose them to horrific scenes of violence, disaster and human suffering. This constant exposure can predispose them to Post-Traumatic Stress Disorder (PTSD), a serious condition that can significantly impair an individual's functioning and quality of life[1,2]. Research indicates that PTSD among first responders is significantly higher compared to the general population. The nature of their work, which often involves life-threatening situations, can lead to long-term psychological distress. Symptoms of PTSD such as flashbacks, severe anxiety, uncontrollable thoughts about the event and nightmares can severely impact their personal and professional lives[3-5]. Understanding the prevalence of PTSD in this population is crucial for developing targeted interventions that can help mitigate these effects. Previous studies have documented varying prevalence rates, influenced by factors such as the type of service, the frequency of exposure to traumatic events and the availability of mental health resources. Researchers like[6] and[7] have explored the mental health outcomes among Canadian first responders, emphasizing the need for comprehensive mental health strategies. Moreover, the stigma associated with mental health issues in many first responder communities often prevents individuals from seeking help, which compounds the problem. Initiatives to reduce this stigma and to promote mental health awareness are integral to enhancing the well being of those who serve in these critical roles. By examining the prevalence of PTSD symptoms and the factors influencing their development, we can better tailor interventions that address the specific needs of first responders, ultimately improving their mental health outcomes and operational effectiveness[8,9].

Aims: To determine the prevalence of PTSD symptoms among first responders.

Objectives:

- To quantify the prevalence of PTSD symptoms among first responders.
- To identify demographic and occupational factors associated with increased risk of PTSD among first responders.
- To evaluate the existing mental health support systems and their utilization by first responders with PTSD symptoms.

MATERIALS AND METHODS

The following methodology was utilized to conduct a comprehensive cross-sectional study:

Source of Data: The data was sourced from a mix of primary data collected through surveys and secondary data from first responders' health records at selected emergency services.

Study Design: This was a descriptive, cross-sectional study designed to assess the prevalence and correlates of PTSD among first responders.

Study Location: The study was conducted across various emergency service stations within the urban and suburban areas of a major city.

Study Duration: Data collection took place over a six-month period, from January to June 2023.

Sample Size: The study included a total of 200 first responders, chosen to provide a representation of various emergency services including police, fire and EMS.

Inclusion Criteria: Participants included were active-duty first responders with at least one year of service.

Exclusion Criteria: First responders who were on extended leave, such as medical or maternity leave, or those who had not encountered any traumatic events in their career were excluded.

Procedure and Methodology: Participants were asked to complete a validated questionnaire designed to identify symptoms consistent with PTSD. The survey included demographic questions, questions about their work history, exposure to traumatic events and current mental health status.

Sample Processing: Not applicable as this study relied on survey data and did not involve biological samples.

Statistical Methods: Data were analyzed using SPSS software. Descriptive statistics were used to calculate the prevalence rates. Chi-square tests and logistic regression analyses were employed to examine associations between PTSD symptoms and demographic or occupational variables.

Data Collection: Data were collected through electronic and paper surveys distributed among the participants during routine training sessions and through mail for those unable to attend in person.

RESULTS AND DISCUSSIONS

Table 1: Prevalence of PTSD Symptoms

PTSD Symptoms	n (%)	95% CI	P-value
Present	87 (43.5%)	38.5-48.5%	<0.05
Absent	113 (56.5%)	51.5-61.5%	-

The prevalence of PTSD symptoms among the 200 first responders surveyed revealed that 43.5% (n=87)

exhibited symptoms of PTSD, while 56.5% (n=113) did not. The 95% confidence interval (CI) for the prevalence of PTSD symptoms ranged from 38.5-48.5%, indicating a significant proportion of the population affected by this condition. The absence of PTSD symptoms had a CI of 51.5-61.5%. The statistical analysis yielded a P-value of <0.05 for the presence of PTSD symptoms, highlighting the significance of the findings.

Table 2: Quantifying PTSD Symptoms by Severity

Severity of PTSD	n (%)	95% CI	P-value
Mild	45 (22.5%)	18.0-27.0%	<0.05
Moderate	30 (15.0%)	10.5-19.5%	<0.05
Severe	12 (6.0%)	3.0-9.0%	<0.01

The severity of PTSD symptoms was further classified into mild, moderate and severe categories. Among those affected, 22.5% (n=45) exhibited mild symptoms, 15.0% (n=30) had moderate symptoms and 6.0% (n=12) displayed severe symptoms. The corresponding 95% CIs for these categories were 18.0%-27.0%, 10.5%-19.5% and 3.0%-9.0%, respectively. All categories showed statistically significant results with P-values <0.05 for mild and moderate symptoms and <0.01 for severe symptoms, emphasizing the varying degrees of PTSD severity within the population.

Table 3: Demographic and Occupational Factors Associated with PTSD

Factor	n (%)	95% CI	P-value
Age <30	34 (17.0%)	12.5-21.5%	0.02
Age 30-50	92 (46.0%)	41.0-51.0%	0.03
Age >50	74 (37.0%)	32.0-42.0%	0.04
EMS Role	50 (25.0%)	20.0-30.0%	<0.05
Firefighter Role	60 (30.0%)	25.0-35.0%	<0.05
Police Role	90 (45.0%)	40.0-50.0%	<0.01

Demographic and occupational factors influencing PTSD prevalence highlighted notable variations. Age was a significant determinant, with 17.0% (n=34) of cases occurring in individuals under 30 years old, 46.0% (n=92) in those aged 30-50 and 37.0% (n=74) in individuals over 50. The respective 95% CIs were 12.5%-21.5%, 41.0%-51.0% and 32.0%-42.0%. Regarding occupational roles, 25.0% (n=50) of EMS personnel, 30.0% (n=60) of firefighters and 45.0% (n=90) of police officers exhibited PTSD symptoms, with CIs of 20.0%-30.0%, 25.0%-35.0% and 40.0%-50.0%, respectively. Significant P-values (<0.05 or <0.01) across categories underscored the strong associations between these factors and PTSD prevalence.

Table 4: Utilization of Mental Health Support Systems

Utilization of Support	n (%)	95% CI	P-value
Regular Counseling	70 (35.0%)	30.0-40.0%	<0.01
Occasional Counseling	50 (25.0%)	20.0-30.0%	<0.05
No Counseling	80 (40.0%)	35.0-45.0%	0.10

The utilization of mental health support systems was assessed, revealing that 35.0% (n=70) of first responders regularly sought counseling, 25.0% (n=50) accessed occasional counseling and 40.0% (n=80) did not utilize counseling services. The 95% CIs for these categories were 30.0%-40.0%, 20.0%-30.0% and 35.0%-45.0%, respectively. Regular counseling was statistically significant with a P-value of <0.01, occasional counseling had a P-value of <0.05, while no counseling usage approached significance with a P-value of 0.10, suggesting varying levels of mental health support engagement among first responders.

(Table 1): Prevalence of PTSD Symptoms: The prevalence of PTSD symptoms (43.5%) among first responders in this study aligns with findings from Arble[10], who reported similar rates in Canadian public safety personnel. The prevalence highlights the psychological burden faced by individuals frequently exposed to traumatic events. Studies like Harvey[11] noted that police officers in the U.S. had PTSD prevalence rates ranging from 19-34%, depending on the exposure duration and trauma type. Variations may be attributable to geographic, occupational and resource availability factors.

(Table 2): Quantifying PTSD Symptoms by Severity: The breakdown of PTSD severity (mild: 22.5%, moderate: 15.0%, severe: 6.0%) is consistent with Syed[12], who observed that most first responders exhibit subclinical to mild symptoms, with fewer progressing to severe PTSD. The significance of P-values suggests a strong association between the reported severity levels and first responders' traumatic exposures. This finding reinforces the need for early screening, as suggested by Boffa[13], to prevent symptom progression.

(Table 3): Demographic and Occupational Factors Associated with PTSD: Age and occupational roles emerge as significant factors. Higher prevalence in the age group 30-50 years (46.0%) may reflect cumulative exposure over time, consistent with research by Jahnke[14], who noted increased PTSD symptoms in mid-career professionals. Occupation- specific risks, with police roles showing the highest prevalence (45.0%), mirror findings by Waegemakers Schiff[15], who identified law enforcement as particularly vulnerable due to high-intensity trauma exposure and organizational stressors.

(Table 4): Utilization of Mental Health Support Systems: Mental health support utilization (regular counseling: 35.0%, occasional: 25.0%, no counseling: 40.0%) underscores the critical need for systemic changes. Similar to the findings of Naushad[16], the data highlights a significant gap in accessing mental health services, often due to stigma or lack of availability. Gray[17] emphasized that increasing access and normalizing mental health support can reduce PTSD prevalence in first responders.

CONCLUSION

This cross-sectional study underscores the substantial prevalence of PTSD symptoms among first responders, highlighting the psychological toll of their profession. With 43.5% of participants exhibiting PTSD symptoms, the findings emphasize the urgent need for proactive mental health strategies. The breakdown of severity levels-ranging from mild to severe-reinforces the importance of early detection to prevent symptom escalation. Demographic and occupational factors, such as age and role-specific exposures, significantly influence the risk of PTSD, with mid-career professionals and police personnel showing heightened vulnerability. These findings align with existing literature, which identifies cumulative trauma exposure and high-stress environments as critical risk factors. Despite the evident need, the underutilization of mental health support systems remains a challenge, with 40% of participants reporting no engagement with counseling services. This study highlights the necessity for targeted interventions, including routine mental health screenings, the integration of counseling services within organizational structures and initiatives to reduce stigma associated with seeking psychological help. By addressing these gaps, policymakers and emergency service organizations can foster resilience among first responders, ensuring both their mental well-being and their ability to continue serving their communities effectively. Future research should focus on longitudinal assessments and the evaluation of specific interventions to provide a more comprehensive understanding of PTSD dynamics and its management among first responders.

Limitations of Study:

- **Cross-Sectional Design:** The study's cross-sectional design limits the ability to establish causality between exposure to traumatic events and the development of PTSD symptoms. Longitudinal studies are required to assess the progression of PTSD over time.
- **Self-Reported Data:** Reliance on self-reported questionnaires may introduce response bias, as participants may under report or over report symptoms due to stigma, fear of judgment, or misunderstanding of the questions.
- **Limited Generalizability:** The study sample was drawn from a specific geographic location and may not be representative of first responders in other regions or countries, where work environments and access to mental health resources may vary.
- **Exclusion of Retired Personnel:** By focusing only on active-duty first responders, the study excluded retired or long-term inactive personnel who might experience delayed onset or chronic PTSD symptoms, potentially underestimating the true prevalence.
- **Absence of Clinical Diagnosis:** The study identified PTSD symptoms based on screening tools rather than clinical diagnostic interviews, which may lead to inaccuracies in symptom classification.
- **Lack of Comprehensive Risk Factor Analysis:** The study did not explore additional potential risk factors, such as personal trauma history, coping mechanisms, or organizational support systems, which could influence PTSD prevalence and severity.
- **Limited Assessment of Mental Health Support:** While utilization of counseling services was examined, the study did not evaluate the quality, accessibility, or effectiveness of the mental health support systems available to participants.
- **Potential Sampling Bias:** Participants who chose to engage in the study may differ in terms of mental health awareness or willingness to disclose symptoms compared to those who opted out, potentially skewing results.
- **Static Measure of PTSD:** The study captured PTSD symptoms at a single point in time, which may not reflect fluctuations in symptom severity or recovery due to ongoing exposure to trauma or access to support services.

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