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REVIEW

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Post-traumatic stress disorder and common mental disorders among male FRs: a narrative review of occupational risk factors, diagnostic approaches, evidence-based interventions, and quality of life outcomes

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Abstract

First responders (FRs), including Law enforcement officers (LEOs), firefighters, and paramedics, face repeated trauma exposure and organizational stressors that elevate the risk for post-traumatic stress disorder (PTSD) and common mental disorders (CMDs). Given this disproportionate burden, male FRs, constituting the majority of this workforce, encounter additional help-seeking barriers rooted in occupational culture and masculine role expectations. This narrative review synthesizes evidence (2019–2025) on epidemiology, risk factors, diagnostic strategies, prevention frameworks, treatment modalities, and quality-of-life outcomes associated with PTSD and CMDs among male FRs. A comprehensive literature search was conducted across PubMed, PsycINFO, MEDLINE, and Scopus for peer-reviewed articles published between January 2019 and March 2025 addressing mental health outcomes in first responder populations. PTSD prevalence among FRs ranges from 7–37%, with depression (15–25%), anxiety (15–20%), and hazardous alcohol use (25–30%) frequently co-occurring. Risk determinants include cumulative trauma exposure, moral injury, organizational stressors, shift work-induced sleep disruption, and stigma. Validated screening instruments, including the Posttraumatic Stress Disorder Checklist for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PCL-5), Patient Health Questionnaire-9 (PHQ-9), and Generalized Anxiety Disorder-7 (GAD-7), demonstrate acceptable psychometric properties in this population. Cognitive processing therapy (CPT), prolonged exposure, and Eye Movement Desensitization and Reprocessing (EMDR) show large effect sizes (Cohen's d = 0.8–1.5) for PTSD reduction. Integrated management combining psychotherapy with sleep interventions and workplace accommodations yields superior functional outcomes. Male FRs require integrated workplace-based clinical programs addressing trauma exposure, organizational stressors, and cultural barriers. Future research should prioritize longitudinal designs and implementation science approaches.

Keywords

Post-traumatic stress disorder; First responders; Occupational mental health; Common mental disorders; Male mental health; Evidence-based treatments

1. Introduction

LEOs, firefighters, paramedics, emergency medical technicians (EMTs), search and rescue professionals, and other FRs comprise a vital workforce that provides essential services during emergencies and disasters [1]. Compared to the general population, these professions are significantly more likely to develop mental health issues due to frequent exposure to traumatic events, life-threatening situations, and human suffering [2, 3]. Given that men constitute the vast majority of these workforces, estimates indicate that over 80% of firefighters and LEOs are men [4]. Therefore, male FRs face distinctive occupational and sociocultural barriers to mental health recognition and help-seeking that warrant specific attention.

1.1 Mental health burden among male FRs

Studies repeatedly show that compared to the general population, FRs have significantly elevated rates of PTSD, depression, anxiety, and substance use disorders [5, 6]. About 30% of FRs experience behavioral health issues, compared to 20% of the general population, according to the Substance Abuse and Mental Health Services Administration (SAMHSA)

[7]. Depending on the professional category and assessment technique, the prevalence of PTSD among FRs varies from 7% to 37%, paramedics and EMTs typically having higher rates than LEOs [3, 8].

Male FRs show substantially elevated rates of mental health disorders compared to the general male population, driven by cumulative occupational trauma exposure, organizational stressors, and cultural barriers to help-seeking [4]. The occupational hazard profile of these workers is characterized by cumulative trauma exposure rather than individual catastrophic incidents [9]. A police officer may encounter over 180 traumatic incidents over the course of a 30-year career; research indicates that officers may encounter about three traumatic events every six months [10]. Similarly, compared to the majority of civilian professionals, firefighters and paramedics report recurrent exposure to death, serious injury, and violence at substantially higher rates [11].

1.2 Rationale for focusing on PTSD and common mental disorders

The most common occupational mental health condition among FRs is post-traumatic stress disorder, as defined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5); American Psychiatric Association (APA), 2022, which is characterized by four symptom clusters: intrusion, avoidance, negative alterations in cognition and mood, and hyperarousal after experiencing actual or threatened death, serious injury, or violence [12]. However, PTSD seldom manifests alone; comorbidity with panic disorder, depression, generalized anxiety disorder, and alcohol use disorder is frequent and makes diagnosis and therapy more difficult [13, 14]. The co-occurrence of various disorders results in a complicated clinical picture that calls for multimodal management strategies and thorough assessment. It is crucial to focus on common mental disorders in addition to PTSD, as these conditions regularly co-occur, share risk factors, and together impact quality of life, interpersonal relationships, and vocational functioning [1, 15]. About 15–25% of FRs experience depression, 15–20% have anxiety disorders, and 25–30% report hazardous alcohol use [3, 6]. Increased absenteeism, poor job performance, early retirement, and, sadly, higher suicide rates are all consequences of these situations [6, 16].

1.3 Occupational exposure, stigma, and male-specific help-seeking barriers

First responder occupation offer a unique risk environment due to operational stressors, organizational pressures, and ongoing exposure to potentially traumatic incidents [4]. FRs are routinely exposed to human suffering, violence, and death as part of their professional tasks, in contrast to civilian populations who may encounter isolated traumatic events [2]. The development of symptoms, preventative measures, and therapeutic techniques are all significantly impacted by this chronic exposure paradigm.

According to meta-analytic data, about 33% of FRs report stigma-related barriers to seeking treatment, making stigma one of the biggest obstacles to mental health care for FRs [5]. The first responder culture frequently stresses mental toughness, self-reliance, and emotional stoicism, especially in male-dominated occupations [17, 18]. Male FRs may be reluctant to reveal symptoms or seek treatment because they internalize signals from occupational culture, peer norms, and organizational leadership that seeking mental health support is a sign of weakness or unfitness for duty [19].

Help-seeking barriers are exacerbated by worries about confidentiality, as many FRs worry that receiving mental health treatment would harm their jobs, cause them to lose their duty status, or result in peer criticism [5, 18]. According to research, many symptomatic FRs are discouraged from seeking care due to fear of losing their weapon (for armed personnel), required fitness-for-duty tests, and possible career limits [17]. These concerns carry a specific dimension for male FRs in armed roles (applicable specifically to LEOs), who additionally face the potential loss of firearm-carrying privileges following mental health disclosure, a structural barrier with no equivalent for non-armed personnel [20, 21].

Fig. 1 shows a grouped bar chart comparing point prevalence estimates (%) of five common mental health conditions across LEOs, firefighters, paramedics/EMTs, and the general population. Data were synthesized from [3, 22, 23] and general population estimates were derived from epidemiological surveys.

1.4 Aim and scope of the narrative review

This narrative review covers recent research (2019–2025) on PTSD and common mental disorders among male FRs, with an emphasis on occupational and sociocultural risk factors, diagnostic issues, prevention measures, treatment approaches, and quality-of-life outcomes. The project aims to translate research findings into practical recommendations for occupational health professionals, mental health clinicians, organizational leaders, and policymakers in order to improve mental health outcomes in this high-risk population.

Active-duty military personnel in combat settings were excluded because the operational context, command structure, mandatory deployment, and mental health service architecture of military settings differ fundamentally from civilian first responder organizations; including such populations would introduce heterogeneity that would confound conclusions regarding civilian occupational factors. The review period begins in 2019 to ensure complementarity with recent systematic reviews that comprehensively cover the literature up to 2019–2021 [18, 19, 21], as summarized in Table 1 (Ref. [22–25]), thereby avoiding duplication and focusing on the most contemporary evidence.

2. Methods: narrative review approach

2.1 Study design and protocol

This narrative review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure methodological transparency and reproducibility [26, 27]. The review protocol was developed a priori to define the search strategy, eligibility criteria, and data synthesis approach.

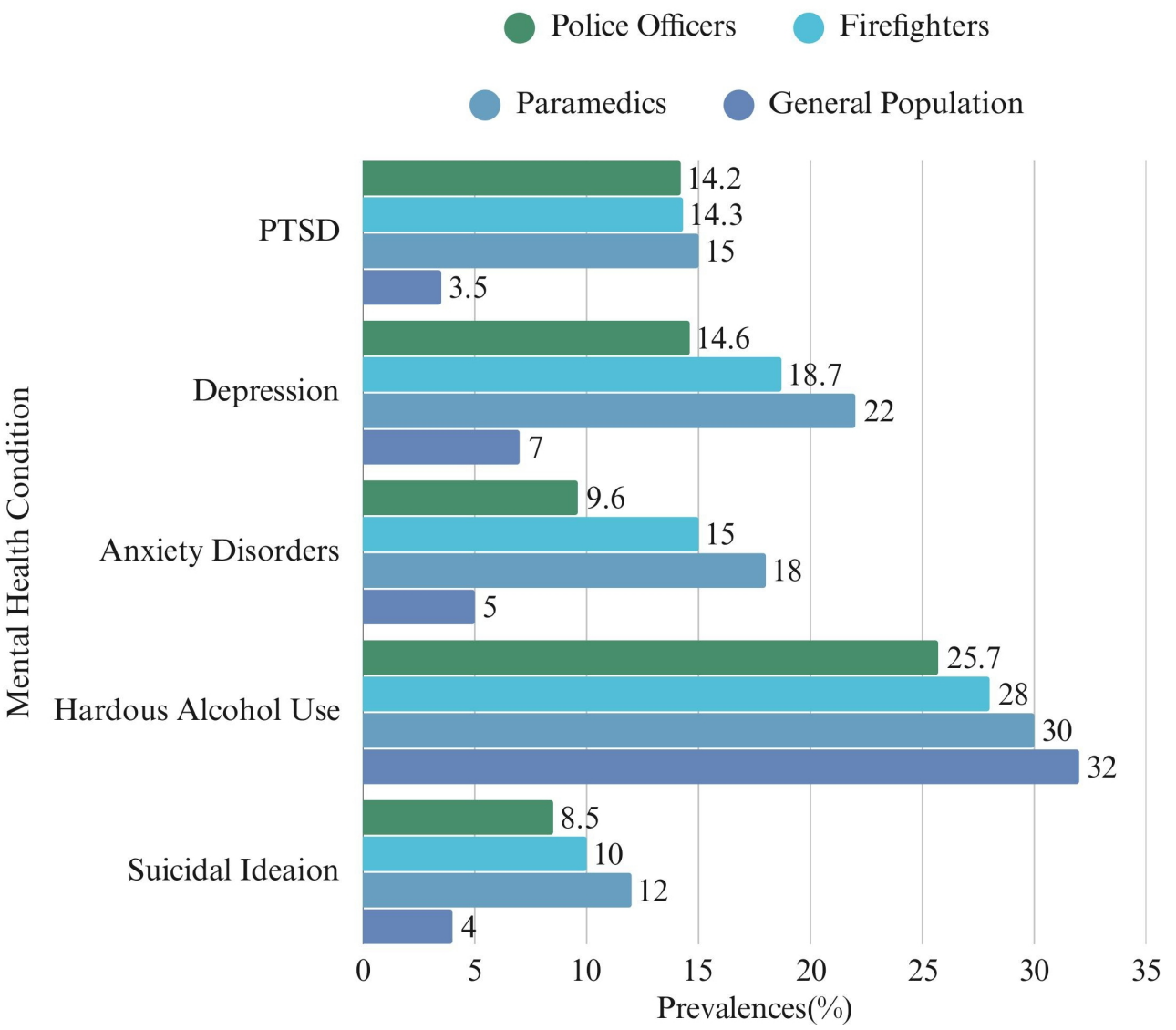

FIGURE 1. Prevalence of mental disorders among male FRs compared to the general population. PTSD: post-traumatic stress disorder.

TABLE 1. Comparison of the current review with recent reviews on first responder mental health (2020–2025).

Feature	Current Review (2025)	Alshahrani *et al.* [24] (2022)	Syed *et al.* [22] (2020)	Wagner *et al.* [23] (2021)	Obuobi-Donkor *et al.* [25] (2022)
Review Type	Narrative review	Systematic review & meta-analysis	Systematic review & meta-analysis	Systematic review	Scoping review
Time Frame	2019–2025	2019–2021	1980–2019	1980–2017	1985–2021
Population	Male FRs (police, fire, EMS)	All FRs	Police personnel only	Firefighters only	Military & firefighters
Primary Focus	PTSD, CMDs, workplace factors, and QoL	Treatment effectiveness for PTSD	Prevalence & risk factors	PTSD prevalence	PTSD prevalence & determinants
Male-Specific Analysis	Yes	No	Limited	No	No
Moral Injury Coverage	Yes	No	No	No	No

FRs: First responders; PTSD: post-traumatic stress disorder; CMDs: common mental disorders; EMS: Emergency Medical Services; QoL: Quality of Life.

2.2 Information sources and search strategy

A comprehensive literature search was conducted across four electronic databases: PubMed (n = 187), Web of Science (n = 234), Scopus (n = 298), and Google Scholar (n = 128) from January 2019 to March 2025. The search strategy combined Medical Subject Headings (MeSH) terms and free-text keywords using Boolean operators (AND, OR).

The primary search terms included:

• Population: "FRs" OR "LEOs" OR "law enforcement" OR "firefighters" OR "paramedics" OR "emergency medical technicians" OR "EMTs".

• Condition: "PTSD" OR "post-traumatic stress disorder" OR "depression" OR "anxiety" OR "mental health" OR "mental disorders" OR "psychological distress".

• Context: "occupational health" OR "workplace" OR "occupational stress".

Additional searches were conducted in specialized repositories, including the Published International Literature on Traumatic Stress (PILOTS) database, which focuses on traumatic stress literature. Reference lists of included studies and relevant systematic reviews were manually screened to identify additional eligible articles.

2.3 Eligibility criteria

2.3.1 Inclusion criteria

Studies were included if they met the following criteria:

1. Examined adult (≥18 years) first responder populations, including LEOs, firefighters, paramedics, EMTs, or disaster responders.

2. Addressed PTSD, depression, anxiety, substance use disorders, or related mental health conditions, assessed using validated instruments or defined according to DSM-5/International Classification of Diseases (ICD-11) diagnostic criteria or comparable frameworks, including symptom-level measures such as the PCL-5 used in structured clinical interviews.

3. Published in the English language.

4. Published in peer-reviewed journals or reported as official governmental/organizational reports.

5. Published between January 2019 and March 2025.

6. Study designs: systematic reviews, meta-analyses, randomized controlled trials, cohort studies, cross-sectional studies, or qualitative investigations.

2.3.2 Exclusion criteria

Studies were excluded if they:

1. Focused exclusively on military personnel in active combat settings.

2. Examined only physical health outcomes without mental health components.

3. Were case reports, editorials, commentaries, or opinion pieces without empirical data.

4. Were published in non-English languages.

5. Were conference abstracts without full-text availability.

2.4 Study selection process

Study selection followed a two-phase screening process (Fig. 2). In Phase 1, titles and abstracts of all identified records were screened against the eligibility criteria. In Phase 2, full-text articles of potentially eligible studies were retrieved and assessed for inclusion. The selection process is illustrated in the PRISMA flow diagram.

Title and abstract screening was conducted independently by two reviewers using a Linux-based search for systematic review, with disagreements resolved by consensus discussion. Full-text eligibility assessment was similarly performed by two reviewers independently; both screening phases were conducted by the same two reviewers, with unresolved disagreements referred to the senior author. A total of 847 records were identified through database searching. After removing 203 duplicate records, 644 unique records remained for title and abstract screening. Of these, 555 records were excluded based on irrelevant topics or wrong study design, leaving 89 full-text articles to be assessed for eligibility. Following full-text review, 74 articles were excluded for the following reasons: not first responder populations (n = 28), no mental health data (n = 18), published before 2019 (n = 14), non-English language (n = 8), and no full-text available (n = 6). A final sample of 15 studies met all inclusion criteria and were included in the narrative synthesis.

2.5 Data extraction

Data were extracted using a standardized form that captured: (1) study characteristics (author, year, country, design); (2) participant characteristics (sample size, first responder type, sex distribution); (3) mental health outcomes assessed; (4) measurement instruments used; (5) prevalence estimates or treatment effects; and (6) key findings relevant to the review objectives.

2.6 Synthesis of results

Studies reporting male-specific data or having direct relevance to occupational health policy were prioritized in the narrative synthesis, with these decisions documented a priori in the extraction form. A narrative synthesis approach was employed rather than a quantitative meta-analysis, given the breadth of topics addressed and the heterogeneity of study designs. Evidence was organized thematically according to the review's primary domains: prevalence and burden, risk factors, diagnosis and screening, prevention, treatment, and quality of life. Within each domain, evidence was synthesized to identify consistent findings, areas of uncertainty, and implications for practice. Fig. 2 illustrates the systematic identification, screening, eligibility assessment, and inclusion of studies for the narrative review. Records were identified from four electronic databases (PubMed, Web of Science, Scopus, and Google Scholar) covering the period January 2019 to March 2025. After duplicate removal and application of inclusion/exclusion criteria, 15 studies were included in the qualitative synthesis [26, 27].

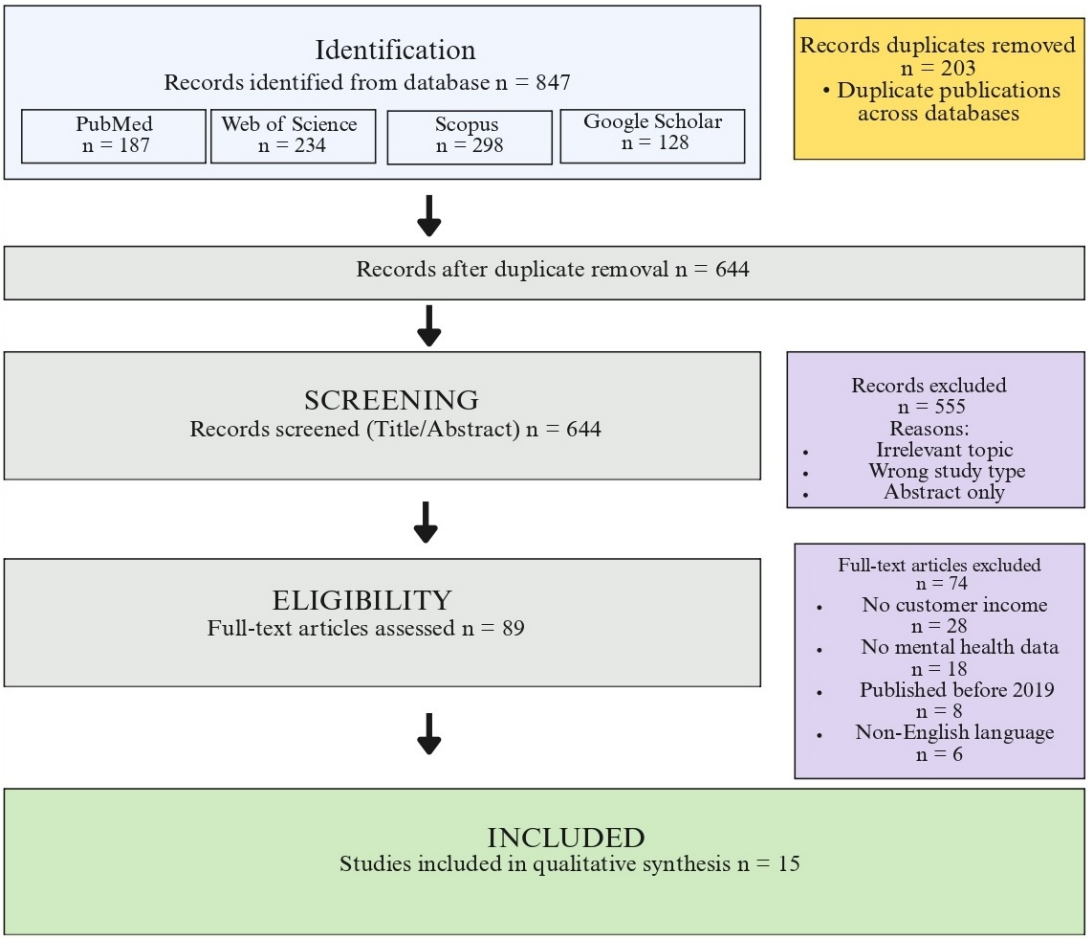

FIGURE 2. PRISMA flow diagram of literature search and selection process. Flow diagram illustrating the systematic identification, screening, eligibility assessment, and inclusion of studies for the narrative review. Records were identified from four electronic databases (PubMed, Web of Science, Scopus, and Google Scholar) covering the period from January 2019 to March 2025. After duplicate removal and application of inclusion/exclusion criteria, 15 studies were included in the qualitative synthesis.

2.7 Time frame (2019–2025)

The review focused on literature published between January 2019 and May 2025 to capture the most recent evidence on first responder mental health. This time frame was selected to include contemporary research that reflects current diagnostic criteria (DSM-5/ICD-11), emerging treatment approaches, and the evolving understanding of occupational mental health risks. Seminal earlier works cited in the introduction [2, 3] were included for conceptual context but were not part of the PRISMA-guided inclusion set, as they represented landmark studies that continue to inform current understanding.

3. Results: prevalence and burden of PTSD and common mental disorders in male FRs

The 15 included studies comprised four meta-analyses and systematic reviews, three randomized controlled trials, four longitudinal cohort studies, two cross-sectional surveys, one qualitative investigation, and one mixed-methods study. Studies were conducted in police, mixed first responder samples, paramedic and EMT populations, and firefighters across different countries. All 15 studies examined PTSD as a primary outcome; 11 examined depression; eight examined anxiety disorders; and seven examined substance use or sleep outcomes. Key findings across the included evidence are synthesized below.

3.1 Prevalence of PTSD, depression, anxiety, and substance use disorders

The prevalence of mental disorders among FRs has been extensively studied, with consistent evidence demonstrating elevated rates compared to the general population. A comprehensive meta-analysis examining ambulance personnel (equivalent to paramedics and EMTs in the U.S. context) found pooled prevalence estimates of 11% for PTSD, 15% for depression, 15% for anxiety, and 27% for general psychological distress. Among LEOs, prevalence estimates for PTSD range from 7% to 19%, with a meta-analytic pooled estimate of approximately 14% [22]. These rates substantially exceed the 6–8% lifetime prevalence of PTSD in the general population [28].

Depression affects a significant proportion of FRs, with studies reporting prevalence rates between 15% and 25% depending on the measurement instrument and population stud-

ied [1]. A ten-year follow-up study of police FRs to the September 11 attacks found that 25% reported symptoms of depression [29]. Anxiety disorders, including generalized anxiety disorder and panic disorder, affect approximately 15–20% of FRs, with higher rates observed in paramedics and EMTs compared to other first responder groups [3].

Among first responder populations, substance use disorders specially alcohol use disorder, represent a serious concern. According to research, 25–30% of FRs have risky drinking habits, and alcohol is frequently used as a maladaptive coping strategy for symptoms of trauma and occupational stress [2]. Hazardous alcohol use both contributes to and exacerbates symptoms of depression and PTSD [30, 31], indicating a reciprocal association between alcohol consumption and mental health issues.

3.2 Differences across police, firefighters, paramedics, and disaster responders

Important differences in mental health prevalence exist across first responder subgroups, reflecting variations in exposure patterns, organizational factors, and selection processes. LEOs generally show the lowest rates of PTSD among first responder groups, with estimates around 7–15% [2, 22]. This finding may reflect rigorous psychological screening during hiring, training in emotional regulation, and occupational acculturation to traumatic exposures. However, LEOs show elevated rates of depression, alcohol use, and suicide compared to the general population [16].

Firefighters have intermediate rates of PTSD, with estimates ranging from 7% to 37% depending on the population characteristics and assessment method, according to [32]. The wide variation in exposure frequency can be explained by the fact that urban firefighters typically receive more calls involving trauma than their rural counterparts. Specific stressors faced by firefighters include exposure to burn victims, building collapses, and hazardous materials, all of which can result in cumulative traumatic stress disorder. Approximately 65–70% of U.S. fire departments are staffed by volunteers (National Fire Protection Association (NFPA), 2023) [33, 34]. Volunteer firefighters have limited peer support infrastructure, less psychological training, and different organizational structures, all of which affect mental health risk and access to care.

Among first responder groups, paramedics and EMTs regularly exhibit the greatest rates of psychological distress and PTSD, with estimates of up to 27% for general psychological distress and 15–20% for PTSD [3]. This pattern may be explained by several factors, including increased exposure to cumulative trauma without the protective elements of the fire service culture, less stringent psychological screening than police, and a higher frequency of direct patient contact involving death and serious injury [1].

The type, length, and severity of the catastrophe response have a significant impact on the mental health outcomes of this diverse group of responders. Approximately 10–20% of responders fulfill diagnostic criteria in the months after large-scale emergency events, according to studies conducted after significant disasters [8]. First responder mental health was significantly impacted by the COVID-19 pandemic; research indicates that PTSD, depression, and anxiety were more common throughout the pandemic era [35]. PTSD rates of 10–20% have been documented following large-scale disasters [8]. Role ambiguity and prolonged deployment further compound mental health risk among disaster responders. During the COVID-19 pandemic specifically, PTSD, depression, and anxiety increased significantly among this group [35, 36].

It is important to note that these prevalence estimates are likely conservative due to systematic underreporting. Stigma, confidentiality fears, and career concerns suppress self-reported symptoms, particularly among male FRs who tend to normalize occupational distress as a routine part of the job [5, 19].

3.3 Comparison with the general male population

FRs exhibit much higher rates of mental health disorders across all categories compared to the general male population. Male FRs have a lifetime prevalence of PTSD of at least 10–15%, while average adult males have a prevalence of about 4–6% [28]. Similarly, rates of 15–25% are typical in first responder populations, but major depressive disorder affects roughly 5–7% of adult males in the general population.

A summary of prevalence estimates for major mental disorders across first responder subgroups in comparison to the overall male population is shown in Table 2 (Ref. [7, 12, 22, 24, 30, 31, 36–41]). The necessity for focused preventative and intervention programs is supported by these comparisons, which highlight the occupational mental health burden experienced by FRs.

4. Workplace and sociocultural risk factors

4.1 Repeated trauma exposure and moral injury

The most fundamental occupational risk factor for mental health issues in FRs is cumulative exposure to potentially traumatic events. Unlike the general population, where trauma exposure is often discrete and episodic, FRs are constantly and chronically exposed to death, serious injury, violence, and human suffering [2]. According to a study [4], more than 80% of FRs report having encountered stressful situations at work, and many report multiple traumatic events per month.

The idea of cumulative trauma acknowledges that the psychological effects of repeated exposure to sub-threshold traumatic events may be comparable to those of a single, severe traumatic event. Each exposure may weaken psychological resilience, gradually sensitize stress response systems, and make a person more susceptible to future exposures [42]. This cumulative approach has significant preventative implications, indicating that maintaining first responder mental health requires managing the overall exposure burden rather than just responding to catastrophic situations.

Though it frequently co-occurs with PTSD, moral injury has become a more widely acknowledged psychological wound [43, 44]. The psychological anguish brought on by acts or inactions that go against one's firmly held moral beliefs and

TABLE 2. Prevalence of mental disorders in male FRs compared to the general male population.

Disorder	General Male Population	LEOs	Firefighters	Paramedics/EMTs	Disaster Workers
PTSD	4–6%	7–15%	7–22%	11–20%	10–20%
Depression	5–7%	12–25%	15–20%	15–27%	15–25%
Anxiety Disorders	5–8%	10–15%	12–18%	15–22%	12–20%
Alcohol Use Disorder	10–12%	18–25%	20–30%	20–28%	18–25%
Suicidal Ideation	3–4%	15–25%	15–20%	10–15%	12–18%

Prevalence estimates were synthesized from meta-analytic and epidemiological sources: PTSD general population [12, 22, 37–39]; depression [22, 24, 40]; anxiety [22, 24, 40]; alcohol use disorder [22, 30, 31]; suicidal ideation [7, 22, 36, 41]. PTSD: post-traumatic stress disorder; LEOs: Law enforcement officers; EMTs: emergency medical technicians.

values is known as moral injury [45]. FRs may experience moral injury in a variety of situations, such as being unable to save a victim despite their best efforts, having to choose between victims when resources are scarce, witnessing avoidable deaths as a result of systemic failures, or being forced to adhere to protocols that go against their personal ethical beliefs [44].

According to recent studies [46, 47], 9–18% of FRs satisfy the criteria for clinically meaningful moral injury, and 42–50% report exposure to potentially morally harmful events. Moral injury is a significant target for prevention and treatment because of its high association with suicidal ideation, PTSD, and depression [48]. Male FRs may be especially susceptible to moral injury because of masculine norms that prioritize protection and competence, which could exacerbate suffering if these expectations are not fulfilled.

4.2 Organizational stressors: job strain, effort–reward imbalance, and workplace psychosocial factors

Organizational pressures may cause an equal or larger psychological load for many FRs, even while trauma exposure receives a lot of attention [4]. In first responder populations, job strain, which is defined by high psychological demands and minimal decision latitude, has been repeatedly linked to burnout, depression, and anxiety [42]. During emergencies, FRs frequently have to deal with a heavy workload and little control over deployment, pace, or working conditions. The effort-reward imbalance (ERI) model posits that health-damaging stress arises when high work effort, in terms of time, energy, and emotional investment, is not met with commensurate reward in the form of income, recognition, job security, or career advancement opportunities [49]. The perception that occupational contributions are undervalued is a significant organizational stressor in first responder settings. FRs may experience psychological distress and demoralization if they believe that organizations, communities, or political institutions undervalue their contributions.

4.3 Shift work, fatigue, and sleep disruption

Shift work is a defining feature of first responder professions that has been frequently linked to detrimental impacts on both physical and mental health. FRs must work evenings, have rotating schedules, and put in long shifts that disrupt circadian rhythms and sleep architecture because they are required around-the-clock [50]. A meta-analysis of sleep disorders among FRs revealed high prevalence rates: 36% for insomnia, 27% for excessive daytime sleepiness, 25% for obstructive sleep apnea, and 20% for shift work disorder [51].

Shift work reduces sleep quality, which increases susceptibility to PTSD, depression, and anxiety; on the other hand, mental health symptoms further disrupt sleep in a vicious cycle [52]. This association between sleep disruption and mental health is bidirectional. In first responder populations, poor sleep quality has been linked to a higher risk of diabetes, cardiovascular disease, and auto accidents (odds ratio: 1.83, 95% confidence interval: 1.08–3.10) [53].

Table 3 (Ref. [51, 54–57]) presents prevalence estimates for sleep disorders among FRs compared to the general working population.

4.4 Masculinity norms, stigma, and confidentiality concerns

Male FRs operate within occupational cultures that have historically valorized emotional stoicism, self-reliance, and mental toughness [17]. These masculinity norms, while potentially adaptive for acute operational performance, can create significant barriers to acknowledging psychological distress and seeking mental health support. Research indicates that male FRs who strongly endorse traditional masculine ideologies show reduced intention to seek mental health care and greater self-stigma regarding mental health treatment [58].

Mental health stigma operates at multiple levels within first responder organizations. Public stigma reflects broader societal attitudes that mental health problems indicate weakness or moral failure. Self-stigma develops when individuals internalize these negative attitudes, leading to shame, reduced self-esteem, and avoidance of help-seeking [5]. Organizational stigma manifests in workplace cultures where mental health difficulties are viewed as incompatible with first responder identity or indicative of unsuitability for duty.

Meta-analytic evidence indicates that approximately one-third of FRs identify stigma as a barrier to mental health care [5]. The most frequently endorsed concerns include fears regarding confidentiality (worrying that seeking treatment will not remain private), perceived negative career impact (concern that mental health treatment will affect promotions or assignments), and peer judgment (worry about being viewed differently by colleagues) [17, 18].

Confidentiality concerns are particularly salient for male

TABLE 3. Prevalence of sleep disorders among FRs.

Sleep Disorder	General Working Population	FRs	Key Findings
Insomnia	10–15%	30–40%	Higher in EMS than police
Excessive Daytime Sleepiness	10–15%	25–30%	Correlates with shift work
Obstructive Sleep Apnea	15–20%	25–35%	Associated with obesity, cardiovascular risk
Shift Work Disorder	10–23%	20–30%	Higher in night shift workers
Poor Sleep Quality (PSQI >5)	30%	50–60%	Correlates with depression, PTSD

Data were synthesized from Huang et al. [51] (meta-analysis of sleep disorders in 101,080 FRs), Khoshakhlagh et al. [54] (sleep disorders and poor sleep quality in firefighters), and Kendrick et al. [55] (sleep quality among paramedics). General working population estimates from Brito et al. [56] and van Straten et al. [57]. FRs: First responders; PTSD: post-traumatic stress disorder; PSQI: Pittsburgh Sleep Quality Index; EMS: Emergency Medical Services.

FRs given the potential career consequences of mental health disclosure. Officers fear being deemed unfit for duty, losing weapon-carrying privileges, or being placed on administrative leave following mental health treatment [17]. These concerns are not entirely unfounded; some departments mandate fitness-for-duty evaluations following mental health disclosures, creating a structural disincentive for help-seeking.

Fig. 3 Multilevel Risk Factor Framework for PTSD and Common Mental Disorders in Male FRs. Conceptual model illustrating the interplay of individual, organizational, and sociocultural factors contributing to mental health outcomes. Solid arrows indicate direct risk pathways converging on the individual; dashed bidirectional arrows represent reciprocal interactions between factor domains. Individual factors (cumulative trauma, moral injury, sleep disruption) are derived from [4, 5, 9, 49, 59], organizational factors (job strain, effort-reward imbalance, safety climate) are derived from [36, 43], and sociocultural factors (stigma, masculinity norms, confidentiality fears) from [5, 15, 16]. Mental health outcomes include PTSD, depression, anxiety disorders, substance use disorders, suicidal ideation, reduced quality of life, and occupational impairment.

5. Diagnosis and prevention strategies

5.1 Challenges in detection and underreporting

Accurate diagnosis of mental disorders in FRs is complicated by multiple factors, including underreporting, symptom minimization, and the normalization of psychological distress within occupational cultures. Research suggests that many symptomatic FRs do not seek formal evaluation or treatment, with studies indicating that fewer than half of those meeting symptom thresholds seek care [5, 18].

The reasons for underreporting are multifaceted. Beyond stigma and confidentiality concerns discussed previously, FRs may minimize or rationalize symptoms as normal responses to a demanding profession, may lack awareness that their symptoms warrant clinical attention, or may believe that they should be able to manage difficulties independently [18]. Male FRs in particular may be socialized to view acknowledgment of psychological difficulties as inconsistent with masculine identity and occupational competence.

Diagnostic challenges also arise from the atypical presentation of mental disorders in occupational contexts. Depression in male FRs may manifest more prominently as irritability, anger, or physical complaints rather than sadness or tearfulness [60]. PTSD symptoms may be interpreted as appropriate vigilance or occupational adaptation rather than pathological hyperarousal. Alcohol use may be normalized as part of occupational culture rather than recognized as problematic self-medication.

5.2 Validated screening tools

Effective identification of mental disorders in FRs requires validated screening instruments that can be administered efficiently in occupational settings while maintaining adequate sensitivity and specificity.

The PTSD Checklist for DSM-5 (PCL-5) is a 20-item self-report measure that assesses DSM-5 PTSD symptoms over the past month [61]. Recent validation studies in first responder samples have confirmed strong psychometric properties, with Cronbach's alpha exceeding 0.90 and good diagnostic accuracy compared with clinician-administered assessments [13]. An optimal cutoff score of 31–33 is typically used for screening, with higher cutoffs (*e.g.*, 41) providing greater specificity for a provisional diagnosis.

The Patient Health Questionnaire-9 (PHQ-9) is a 9-item depression screener that has been validated in multiple first responder samples with excellent internal consistency (Cronbach's alpha >0.85) [13]. Factor analytic studies in FRs support a two-factor structure distinguishing cognitive-affective from somatic depression symptoms, which may have implications for treatment planning.

The Generalized Anxiety Disorder 7-item scale (GAD-7) is a brief self-report measure of anxiety severity that has been validated alongside the PCL-5 and PHQ-9 in first responder sample, demonstrating good internal consistency (Cronbach's alpha >0.85) and convergent validity with clinician-administered anxiety assessments. The GAD-7 is particularly useful in first responder populations, given the high rates of generalized anxiety and its frequent co-occurrence with PTSD and depression.

5.3 Tiered prevention approach

Effective prevention of mental disorders in FRs requires a comprehensive approach spanning primary, secondary, and

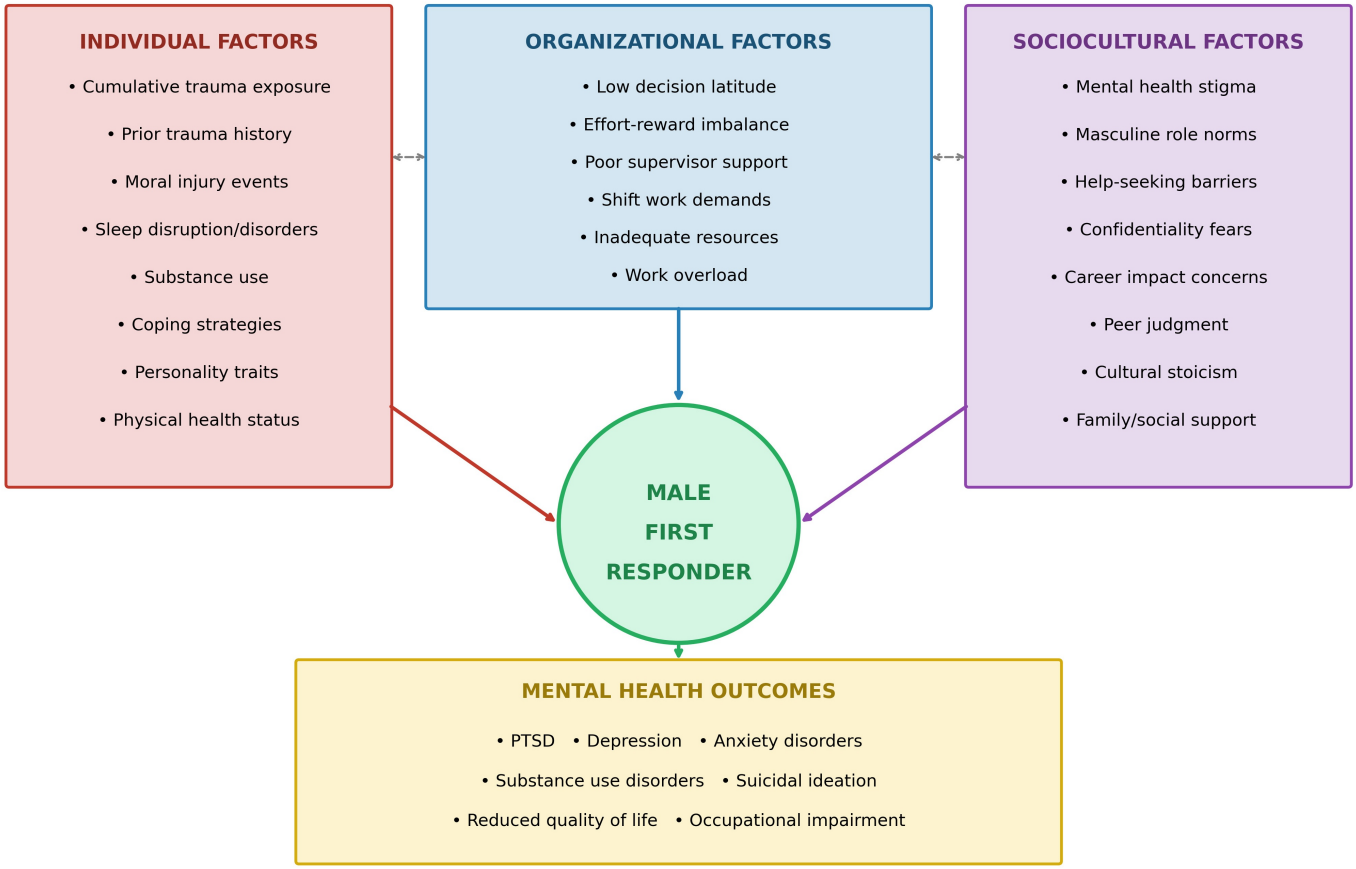

FIGURE 3. Multilevel risk factor framework for PTSD and common mental disorders in male FRs. PTSD: post-traumatic stress disorder.

tertiary levels. It is important to note that prevention evidence is not uniform across disorder types: organizational-level interventions (workload, leadership, climate) have the strongest evidence base for reducing burnout, general distress, and depression, whereas secondary-level screening and psychological first aid interventions more directly target PTSD and anxiety symptoms. Alcohol misuse prevention is primarily addressed through brief motivational interviewing and occupational health policy interventions. This sub-categorization is maintained throughout the following discussion. The following sections detail each level of this framework, including primary, secondary, and tertiary prevention, and the specific strategies applicable within each.

5.3.1 Primary prevention: organizational and leadership interventions

The goal of primary prevention is to improve protective factors and lower risk factors prior to the onset of symptoms. At the organizational level, this entails developing a workplace culture that prioritizes psychological health [4], optimizing work schedules to reduce circadian disturbance [50], guaranteeing sufficient staffing to manage workload, and providing suitable equipment and resources [4]. Primary prevention requires leadership training programs that teach managers about mental health, lessen stigmatizing practices, and encourage helpful reactions to employees who are having difficulties [17]. These approaches align with international guidelines from the International Society for Traumatic Stress Studies (ISTSS) and Phoenix Australia's Centre for Posttraumatic Mental Health, which recommend organizational-level and trauma-informed approaches as foundational components of PTSD prevention in high-risk occupational groups.

Peer support programs are a popular primary prevention method that makes use of first responder organizations' inherent support networks [62]. When necessary, trained peer supports can connect people to professional services, normalize asking for help, and offer informal psychological first aid. According to research, peer support programs are more widely accepted than traditional employee assistance programs, possibly because talking to a peer lowers stigma barriers [63].

The goal of resilience training programs is to develop psychological coping capacities against the negative impacts of traumatic stress. Programs that incorporate stress management, mindfulness, and cognitive reappraisal techniques show some promise, despite conflicting findings regarding the efficacy of resilience training [64]. Delivering such training in ways that are culturally acceptable to first responder populations who may be dubious of "soft skills" training is the main problem.

5.3.2 Secondary prevention: screening and psychological first aid

The goal of secondary prevention is to identify and treat people who exhibit early indications of psychological distress. Symptomatic people who might not otherwise seek assistance can be found through routine, private screening utilizing proven

tools. Ensuring confidentiality safeguards and clear paths to appropriate care without career consequences are crucial to the effectiveness of screening programs [65]. Psychological first aid (PFA) is an evidence-based method of offering prompt assistance after potentially stressful circumstances. While PFA was originally developed for civilian disaster victims, adapted peer-delivered PFA has shown acceptability in FR settings [62, 63]. Unlike Critical Incident Stress Debriefing (CISD), which encourages structured emotional processing and may be harmful, PFA focuses on practical support and connecting personnel to resources. PFA places a high priority on helping those in need by providing them with information, connecting them with social services, and facilitating their access to aid [66]. Instead of pressuring individuals to talk about their emotional responses, PFA concentrates on addressing urgent needs and encouraging natural recovery processes, in contrast to psychological debriefing techniques, which have been demonstrated to be useless and possibly detrimental.

Sleep disturbances and hazardous alcohol use frequently precede or co-occur with PTSD and depression in FR populations; early identification at the secondary prevention level can interrupt this progression before clinical thresholds are met. Early intervention for sleep disturbance and alcohol use is particularly important given these factors' roles as both consequences of and contributors to mental health symptoms. Brief interventions addressing sleep hygiene, alcohol reduction, and stress management may prevent progression from acute distress to chronic mental disorders [65].

6. Management, treatment, and quality of life

6.1 Evidence-based psychotherapies and pharmacological options

When mental health disorders develop, whether due to prevention gaps, trauma severity, individual vulnerability, or systemic barriers to care, evidence-based treatments offer substantial benefit. Multiple trauma-focused psychotherapies have demonstrated efficacy for PTSD, with cognitive processing therapy (CPT), prolonged exposure (PE), and eye movement desensitization and reprocessing (EMDR) receiving the strongest empirical support [67, 68].

A meta-analysis of psychological interventions for FRs found significant effects for reducing PTSD (standardized mean difference (SMD) = −0.86), depression (SMD = −0.63), and anxiety (SMD = −0.38) [24]. Importantly, this meta-analysis found that cognitive-behavioral therapy-based interventions and clinician-delivered treatments produced larger effects than other approaches, supporting the use of established trauma-focused therapies in this population [24].

Cognitive processing therapy is a 12-session treatment that helps patients identify and challenge maladaptive trauma-related cognitions. CPT has been extensively studied in veteran populations and shows strong effects in reducing PTSD symptoms, depression, and functional impairment [69]. The cognitive focus of CPT may be particularly acceptable to FRs who value rational, problem-solving approaches.

Prolonged exposure therapy involves repeated imaginal exposure to trauma memories and *in vivo* exposure to avoided situations. PE has demonstrated robust efficacy across trauma populations and has been specifically studied in FRs following the September 11 attacks, with positive results [70].

Eye movement desensitization and reprocessing is an 8-phase treatment that combines trauma memory processing with bilateral stimulation. EMDR has been studied in mass trauma situations, including natural disasters and terrorist attacks, with evidence supporting its utility for first responder populations [71]. Some FRs may prefer EMDR's less verbally intensive approach compared to traditional talk therapies.

Pharmacotherapy plays an important adjunctive role, particularly for patients with severe symptoms, significant comorbidity, or insufficient response to psychotherapy alone. Selective serotonin reuptake inhibitors (SSRIs), specifically sertraline and paroxetine, are approved for PTSD treatment and also address comorbid depression and anxiety [72]. Prazosin, an alpha-1 adrenergic antagonist, has shown efficacy for trauma-related nightmares and sleep disturbance [73].

6.2 Sleep, substance-use, and physical activity interventions

Beyond sleep and substance-use interventions, emerging evidence supports the role of structured physical activity as a complementary component of mental health treatment for FRs.

Given the high prevalence of sleep disorders and the central role of sleep in mental health recovery, targeted sleep interventions are essential components of comprehensive treatment. Cognitive-behavioral therapy for insomnia (CBT-I) is the first-line treatment for chronic insomnia and has demonstrated efficacy in populations with comorbid PTSD and depression [74, 75]. CBT-I components include sleep restriction, stimulus control, cognitive restructuring of sleep-related beliefs, and sleep hygiene education.

Adaptation of CBT-I for shift workers presents challenges, given that standard protocols emphasize regular sleep-wake schedules, which are incompatible with rotating shift work [76]. Modified approaches that focus on protecting sleep opportunities, optimizing sleep environments, and managing circadian disruption are needed for first responder populations. Light therapy, strategic napping, and melatonin supplementation may complement behavioral interventions for shift-work-related sleep difficulties.

Substance use interventions must address the elevated rates of hazardous alcohol use in FR populations. Brief interventions using motivational interviewing approaches can be delivered in occupational health settings and have demonstrated efficacy in reducing alcohol consumption [77]. For individuals meeting criteria for alcohol use disorder, more intensive treatments, including formal substance use treatment programs, may be necessary.

Physical activity and body-movement-oriented interventions represent a growing area of evidence for first responder mental health that has received insufficient attention in prior reviews. Aerobic exercise has demonstrated effects on PTSD symptom severity, depressive symptoms, and sleep quality in trauma-exposed populations, with mechanistic pathways including hypothalamic–pituitary–

adrenal (HPA) axis regulation, endocannabinoid signaling, and social support from group-based activities [67]. Structured physical fitness programs are particularly well-suited to first responder populations, given existing occupational fitness requirements and the acceptability of physical training as a culturally congruent activity. Emerging evidence from yoga, mindfulness-based movement, and somatic therapies also suggests benefits for trauma-exposed individuals, particularly for hyperarousal and body-based symptoms that may respond less robustly to purely cognitive approaches. Future research should evaluate tailored exercise protocols in first responder samples with standardized PTSD and mental health outcome measures.

6.3 Workplace accommodations and return-to-work strategies

Supporting FRs' continued employment or successful return to work following mental health treatment requires thoughtful workplace accommodations. Modified duty assignments that reduce trauma exposure during acute treatment phases can facilitate recovery without requiring complete work absence. Gradual return-to-work protocols that progressively increase exposure and responsibility allow for the assessment of readiness while providing continued support [78]. Some FR agencies now embed mental health clinicians within their departments, allowing confidential in-house care without the stigma of seeking external services. This model reduces career-related barriers and allows clinical support to be integrated with duty accommodations [62, 63].

Table 4 (Ref. [79–86]) summarizes evidence-based treatments for mental disorders in FRs and their typical response rates.

6.4 Impact on quality of life and functional outcomes

Treatment of mental disorders in FRs aims not only to reduce symptoms but also to restore quality of life and occupational functioning. Quality of life encompasses physical health, psychological well-being, social relationships, and environmental factors, including work satisfaction. Research demonstrates that effective treatment of PTSD and comorbid conditions leads to improvements across these quality-of-life domains [87].

Functional outcomes of particular relevance for FRs include return to full duty status, job performance, career advancement, and prevention of disability retirement. While limited research has specifically examined these outcomes in first responder treatment studies, evidence from veteran populations suggests that trauma-focused treatments can facilitate return to work and improve occupational functioning [78].

Family functioning represents another important outcome domain, given the elevated rates of relationship difficulties and divorce among FRs with mental health conditions. Couple and family interventions that include significant others in the treatment process may enhance outcomes and address the interpersonal consequences of occupational trauma [88].

7. Limitations and future directions

7.1 Limitations of the current review

This narrative review has several limitations that should be noted. First, quantitative meta-analysis was not possible due to the diversity of study designs, measurement tools, and population definitions in the included literature, which limited the precision of prevalence estimates and effect size comparisons. Definitions of first responder populations varied widely across studies; some included solely sworn personnel, whereas others included civilian support staff. Depending on risk exposure patterns, this could inflate or deflate prevalence estimates.

Second, language bias may have been introduced by the emphasis on English-language publications, which excluded pertinent studies from non-English-speaking countries where first responder mental health is an emerging field of study. Given the worldwide scope of first responder occupations and

TABLE 4. Evidence-based treatments for mental disorders in first responders.

Treatment	Target Condition	Format/Duration	Effect Size (PTSD)	Key Considerations
Cognitive Processing Therapy	PTSD, Depression	12 sessions individual/group	d = 1.0–1.5	Cognitive focus; homework required
Prolonged Exposure	PTSD	8–15 sessions	d = 1.0–1.4	Requires trauma narrative
EMDR	PTSD	8–12 sessions	d = 0.8–1.3	Less verbally intensive
CBT-I	Insomnia	4–8 sessions	d = 0.9–1.1	Modify for shift work
SSRIs	PTSD, Depression, Anxiety	Ongoing medication	d = 0.3–0.5	4–6 weeks to onset of effect
Prazosin	Nightmares, Sleep	Ongoing medication	d = 0.5–0.8	May cause dizziness

Effect sizes (Cohen's d/Hedges' g) for PTSD were derived from meta-analyses: CPT from Sager et al. [79] (g = 0.95–1.41 across 29 RCTs); PE and EMDR from McLean et al. [80] and Yunitri et al. [81]; CBT-I from Takano et al. [82] and Reynolds et al. [83]; SSRIs from Jia et al. [84]; Prazosin from LoParo et al. [85] and Skeie-Larsen et al. [86]. The majority of high-quality RCT evidence was generated in veteran and civilian trauma populations; first-responder-specific efficacy trials remain limited. EMDR: eye movement desensitization and reprocessing; CBT-I: Cognitive-behavioral therapy for insomnia; PTSD: post-traumatic stress disorder; SSRIs: Selective serotonin reuptake inhibitors.

the possibility that cultural variables may affect how people express their symptoms and seek assistance, this restriction is especially important.

Third, causal inference about risk variables and outcomes is limited by the literature's prevalence of cross-sectional study methods. Although there is ample evidence linking occupational exposures to mental health disorders, the processes and temporal linkages underlying these links are still poorly understood.

Finally, although filling a significant gap in the literature, this review's emphasis on male FRs reflects the demographic composition of these workforces rather than an assumption that male-specific findings are universally applicable. The majority of included studies used mixed-gender samples and did not report fully sex-stratified analyses, limiting the precision of male-specific conclusions. Where gender-disaggregated data were available, these were incorporated into the narrative synthesis. Future studies should prioritize reporting of sex- and gender-disaggregated findings, with sufficient statistical power to detect gender-specific effects, to advance understanding of first responder mental health across all gender identities.

7.2 Gaps in current evidence

The field of research on first responder mental health is expanding, but there are still a number of important gaps in the body of knowledge. Understanding how cumulative exposure, career stage, and organizational characteristics combine to influence long-term mental health outcomes is limited by the dearth of longitudinal research that tracks mental health trajectories from career entry through retirement. The limited longitudinal studies that are now available have mostly concentrated on PTSD rather than the entire range of common mental disorders, and they have usually tracked respondents for very short periods of time (2–5 years).

Despite the male predominance in these professions and the well-established gender variations in mental health symptom presentation, help-seeking behaviors, and treatment response, there remains a lack of research explicitly looking at male FRs as a unique population. The majority of current research either focuses solely on mixed-gender samples without sufficient power to identify gender-specific effects or combines male and female participants without sex-stratified analysis.

With few rigorous randomized controlled trials assessing organizational interventions, peer support programs, or resilience training in first responder populations, the evidence base for preventative strategies remains limited. In particular, there is a lack of implementation science research on how to incorporate effective treatments into standard practice in first responder groups.

Compared to military samples, first responder populations have not received as much empirical attention to moral injury, despite its growing recognition as a significant phenomenon. Important areas for future development include evidence-based treatments that explicitly address moral injury in FRs, validated assessment tools, and prevalence estimates.

7.3 Future research directions

To further the field, future research should focus on a few important areas. First, prospective cohort studies that track FRs from academy training through career progression and retirement would offer vital information about the natural course of occupational mental health disorders and pinpoint the best times to intervene. To describe dynamic interactions over time, such research should include recurrent evaluations of trauma exposure, organizational characteristics, and mental health outcomes. Second, research on interventions should go beyond efficacy studies to look at how evidence-based practices are implemented and spread in actual first responder settings. Research findings could be translated into better practices more quickly with hybrid effectiveness-implementation study designs that assess clinical outcomes and implementation procedures.

Third, utilizing multilevel analytical techniques that may take into consideration the nested structure of FRs within units, departments, and jurisdictions, research should investigate the confluence of individual, organizational, and sociocultural aspects. These methods would enable identification of modifiable organizational elements that could be changed by altering practices and policies.

Fourth, technology-delivered interventions, including smartphone applications, telehealth platforms, and digital therapeutics, represent promising approaches for reaching FRs who may be reluctant to seek traditional mental health services. Research evaluating the acceptability, feasibility, and effectiveness of these approaches in first responder populations is needed.

Lastly, studies should focus on the diversity of first responder populations, looking at how variables such as race/ethnicity, sexual orientation, and geographic location, affect treatment outcomes, help-seeking behaviors, and mental health risk. Achieving equitable mental health outcomes across various first responder groups may need culturally appropriate interventions and implementation methodologies.

8. Conclusion

Male FRs, including LEOs, firefighters, and paramedics, face substantial occupational risks for PTSD, depression, anxiety, and related mental disorders arising from cumulative trauma exposure, moral injury, organizational stressors, shift work-induced sleep disruption, and cultural barriers to help-seeking rooted in masculine norms emphasizing emotional stoicism and self-reliance. This narrative review synthesized contemporary evidence (2019–2025) demonstrating that PTSD prevalence ranges from 7% to 37% across first responder populations, with depression, anxiety, and hazardous alcohol use frequently co-occurring and compounding functional impairment. Risk is shaped by multilevel determinants extending beyond direct trauma exposure to include organizational factors such as low decision latitude, effort–reward imbalance, and inadequate supervisory support. Validated screening instruments, including the PCL-5, PHQ-9, and GAD-7, demonstrate

acceptable psychometric properties when embedded within confidential, career-protective assessment pathways. Prevention is optimally delivered through tiered frameworks encompassing organizational redesign, peer support programs, exposure-triggered screening, and structured return-to-work protocols. Evidence-based treatments, particularly cognitive processing therapy (CPT), prolonged exposure, and EMDR, demonstrate large effect sizes for symptom reduction, while integrated management combining psychotherapy with sleep interventions, substance use treatment, and workplace accommodations yields superior functional outcomes and improved quality of life across physical, psychological, and occupational domains. Despite this evidence base, important gaps remain: longitudinal research tracking mental health trajectories from career entry through retirement is lacking, male-specific intervention studies are scarce, and implementation science examining how to translate efficacious treatments into routine practice in first responder settings remains limited. Addressing this occupational mental health challenge requires integrated workplace clinical programs, organizational cultures that normalize help-seeking, structural protections that reduce barriers to care, and continued investment in research. The men who serve as FRs protect communities during their most vulnerable moments, ensuring their mental health represents both an ethical obligation and a strategic investment in emergency response capacity.

AVAILABILITY OF DATA AND MATERIALS

Not applicable. All data were derived from published articles.

AUTHOR CONTRIBUTIONS

STZ and HQ—designed the research study; wrote the manuscript. HQ—performed the research. STZ—analyzed the data. SWL—provided help and advice on the study design and overall supervision. All authors contributed to editorial changes in the manuscript and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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