

Work-Related Stress And Burnout Among Emergency Medical Technicians In The Saudi Red Crescent Authority: A Systematic Review Of Risk Factors And Mitigation Strategies

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Abstract

Background:

Emergency Medical Technicians (EMTs) working in prehospital care are highly vulnerable to work-related stress and burnout due to high workloads, exposure to traumatic events, and irregular shifts. In Saudi Arabia, the Saudi Red Crescent Authority (SRCA) is the primary provider of emergency medical services, yet systematic evidence on the extent, risk factors, and mitigation strategies for EMT stress and burnout remains limited.

Objective:

This review aimed to systematically synthesize evidence on the prevalence, risk factors, and mitigation strategies for work-related stress and burnout among EMTs, with a focus on SRCA personnel in Saudi Arabia.

Methods:

A systematic search was conducted in PubMed, Scopus, Web of Science, and Google Scholar for studies published between 2010 and August 2025. The review followed PRISMA 2020 guidelines. Eligible studies included quantitative, qualitative, and mixed-methods research on stress, burnout, or related psychological outcomes among EMTs/paramedics in Saudi Arabia and comparable international EMS systems. Data extraction focused on prevalence, risk factors, and evaluated interventions. Quality appraisal was performed using the Newcastle–Ottawa Scale (NOS) and CASP checklist.

Results:

Out of 624 records screened, 24 studies were included (7 from Saudi Arabia; 17 international). Saudi studies consistently reported moderate-to-high prevalence of stress ($\approx 30\text{--}40\%$), anxiety (up to 40%), and burnout. Identified risk factors included heavy mission loads, extended and irregular shifts, inadequate sleep, stimulant dependence, and repeated exposure to traumatic incidents. International evidence corroborated these findings and highlighted additional psychosocial predictors such

as poor coping strategies and low resilience. Mitigation strategies with demonstrated benefits included fatigue risk management (e.g., shift restrictions, strategic napping), sleep health interventions, structured peer-support models, and resilience/mindfulness training. However, Saudi-specific interventions remain scarce.

Conclusions:

EMTs in SRCA face considerable stress and burnout risks, mirroring international trends but with unique cultural and operational stressors such as mass gatherings (Hajj/Umrah). Evidence supports organizational interventions (fatigue management, workload distribution), structured peer-support programs, and culturally adapted resilience training as priority strategies. Further longitudinal and interventional research is needed in Saudi contexts to evaluate the effectiveness of these approaches.

Keywords: Emergency Medical Technicians, Saudi Red Crescent Authority, work-related stress, burnout, risk factors, fatigue management, resilience, systematic review

Introduction

Emergency Medical Technicians (EMTs) play a critical role in pre-hospital emergency care, often operating under high-pressure conditions, with frequent exposure to traumatic events, unpredictable workloads, and life-and-death decision making. These occupational demands place EMTs at considerable risk for work-related stress and burnout, conditions which not only impair their psychological well-being but can also compromise the quality of care provided (Burns & Paton, 2020; Maunder et al., 2019).

In Saudi Arabia, data addressing stress, anxiety, depression, and burnout among paramedics and EMTs—especially those working with the Saudi Red Crescent Authority (SRCA)—have begun to emerge. For example, Almutairi, Al-Rashdi, and Almutairi (2020) found that among paramedics in Riyadh, approximately 30.5% reported stress, 40.0% anxiety, and 26.7% depression. Predictors included number of mission calls, sleep duration, use of stimulant beverages, and presence of noncommunicable diseases. Another study by Alenazi, Al-Otaibi, and Alrashidi (2016) examined stress and burnout among Red Crescent paramedics in Riyadh and identified links between working conditions (such as workload, shift patterns, and role ambiguity) and elevated burnout scores. More recently, Alshamrani et al. (2024) investigated distress among Saudi paramedics related to traumatic events, highlighting that repeated exposure to critical incidents is a substantial risk factor.

Despite these insights, there remains a gap in the literature regarding comprehensive and systematically synthesized knowledge about all risk factors (organizational, individual, environmental) for stress and burnout among EMTs in SRCA, as well as evaluations of mitigation or intervention strategies suited to the Saudi context.

Rationale and Aim

Given the vital importance of maintaining EMTs' mental health for both personnel welfare and patient safety, a systematic review focusing on the SRCA context is warranted. The aim of this review is to identify and synthesize empirical evidence on:

1. The prevalence and severity of work-related stress and burnout among EMTs in the Saudi Red Crescent Authority;

2. Risk factors contributing to stress and burnout (e.g., occupational, personal, environmental);
3. Existing strategies (organizational, policy, individual) for mitigating these risks, and evidence for their effectiveness.

By doing this, we hope to inform policy makers, SRCA leadership, and health service planners in Saudi Arabia about where to focus efforts to reduce stress and burnout, ultimately improving EMT well-being and the quality of emergency services.

Literature Review

Burden and Prevalence

Work-related stress and burnout are consistently elevated among prehospital clinicians due to exposure to critical incidents, time pressure, and high job demands. Global evidence shows substantial burdens of emotional exhaustion, depression, anxiety, and PTSD in EMS/paramedic populations (e.g., qualitative synthesis: Lawn et al., 2020; recent cross-sectional and review evidence: Haruna et al., 2023; Liu et al., 2024).

Within Saudi Arabia, SRCA-focused research demonstrates clinically meaningful levels of psychological symptoms. In Riyadh SRCA stations, Almutairi et al. (2020) reported notable prevalence of stress, anxiety, and depression and identified operational predictors (mission volume, short sleep, stimulant use, comorbidity). Earlier work with Red Crescent ambulance workers in Riyadh also linked workload and shift patterns with elevated burnout (Alenazi et al., 2016). Newer Saudi studies emphasize distress related to repeated traumatic exposure among paramedics (Alshamrani et al., 2024).

Risk Factors

Organizational and Job-Design Factors

Shift length, night work, and irregular schedules are repeatedly associated with fatigue and burnout in EMS. Evidence-based guidance recommends shifts shorter than 24 h to reduce fatigue and improve sleep (Patterson et al., 2018). Subsequent trials show tailored sleep-health education improves sleep quality and reduces fatigue among EMS clinicians (Patterson et al., 2023), while app-based sleep interventions for paramedic shift-workers show promising (though preliminary) gains (Shriane et al., 2024). A focused review suggests strategic napping during night shifts may reduce subjective fatigue (Thielmann et al., 2024). In Saudi contexts, high mission load and long/irregular shifts are repeatedly flagged as stressors for SRCA personnel (Almutairi et al., 2020; Alenazi et al., 2016).

Operational Exposure and Critical Incidents

Frequent exposure to life-threatening emergencies, pediatric deaths, and multi-casualty events contributes to acute stress and secondary trauma. Meta-analytic and review evidence in paramedics highlights high rates of PTSD and general psychological distress linked to critical incidents (Nordquist et al., 2023; Liu et al., 2024). In Saudi paramedics, recent work underscores traumatic-event exposure as a salient driver of distress (Alshamrani et al., 2024).

Individual and Psychosocial Factors

Short sleep duration, stimulant dependence, underlying health conditions, and coping profiles (e.g., emotion-focused coping, substance use) are implicated in higher burnout scores (Almutairi et al., 2020; global syntheses). Personality traits and resilience resources can modify stress-burnout trajectories and retention (Betts et al., 2024).

Consequences for Safety and Care Quality

Burnout and chronic fatigue are linked with safety-relevant outcomes—errors, adverse events, and near-misses—in prehospital care. A 2025 scoping review maps multiple pathways from clinician distress to patient safety risks (Tikkanen et al., 2025). Experimental and quasi-experimental EMS studies also show that targeted fatigue countermeasures can reduce on-shift sleepiness and fatigue (Patterson et al., 2015).

Mitigation Strategies

Organizational/Policy Approaches

Fatigue risk management: Consensus guidance recommends limiting 24-h shifts, promoting adequate recovery sleep, formal fatigue-risk programs, and sleep-health education (Patterson et al., 2018; 2023). Controlled and pilot studies suggest real-time fatigue countermeasures and digital sleep-health tools can produce short-term improvements (Patterson et al., 2015; Shriane et al., 2024). Allowing brief strategic naps on night shifts appears beneficial (Thielmann et al., 2024).

Workload and staffing: International EMS literature calls for optimizing crew configurations and call distribution to reduce overload; Saudi studies similarly highlight mission volume as a modifiable risk factor in SRCA (Almutairi et al., 2020).

Psychosocial and Individual-Level Interventions

Peer support and debriefing: Evidence on critical incident stress management (CISM) and debriefings is mixed. Some investigations report perceived benefits of peer-support/CISM frameworks among integrated fire/EMS services (Price et al., 2022), while long-standing critiques note variable or even adverse effects when protocols are not well implemented (e.g., EMS-specific critiques and mixed overviews). Training frameworks like CARES can improve emotional expression and help-seeking among paramedic students (Flanagan et al., 2023). Overall, peer programs should be structured, voluntary, and integrated with stepped professional care. **Mindfulness and resilience programs:** In prehospital settings, multi-component programs (e.g., FIRECARE—mindfulness + heart-coherence + positive psychology) demonstrate reductions in burnout and stress markers (Giaume et al., 2024). Broader health-professional meta-analyses corroborate small-to-moderate improvements in burnout with mindfulness-based interventions (Salvado et al., 2021). Mobile/tech-enabled interventions targeting burnout and compassion fatigue are emerging with early supportive evidence (Deriglazov et al., 2025).

Education and Skill-Building

Team communication, emotion-regulation skills, and grief/bereavement competencies (especially in pediatric deaths) are targets for training; near-peer or structured skills frameworks can improve confidence and coping (Flanagan et al., 2023; Whitfield et al., 2021).

Saudi-Specific Evidence and Context

Saudi studies within SRCA highlight the confluence of mission volume, irregular shift work, and sleep restriction in predicting distress and burnout (Alenazi et al., 2016; Almutairi et al., 2020). Emerging Saudi evidence links burnout with diminished paramedic performance in the Makkah region, underlining workforce and patient-care implications (local journals; interpret cautiously but directionally consistent with international data). Saudi-specific research on intervention effectiveness remains sparse, indicating a need for implementation studies of fatigue-risk programs, structured peer support integrated with clinical mental-health pathways, and culturally adapted mindfulness/resilience training within SRCA.

Gaps and Directions

Key gaps relevant to SRCA include: (1) robust causal evidence (RCTs or strong quasi-experiments) on organizational changes (shift redesign, staffing models); (2) long-term follow-up on mental-health and safety outcomes after interventions; (3) contextual tailoring and evaluation of peer-support/CISM alternatives that align with Saudi practice and culture; and (4) implementation science on scaling digital sleep-health and resilience programs in SRCA operations. Strengthening routine surveillance (sleep, fatigue, distress) and linking to safety outcomes would support continuous quality improvement.

Methods

Search Strategy

This review followed the PRISMA 2020 guidelines for systematic reviews. A comprehensive search was conducted in PubMed, Scopus, Web of Science, and Google Scholar between January 2010 and August 2025. Keywords combined “stress,” “burnout,” “paramedics,” “emergency medical technicians,” “Saudi Red Crescent,” “EMS,” “risk factors,” and “mitigation.” Boolean operators (AND/OR) and Medical Subject Headings (MeSH) were applied to maximize coverage. Reference lists of included studies were also screened.

Inclusion and Exclusion Criteria

- **Inclusion:** (a) empirical studies (quantitative, qualitative, or mixed methods) assessing work-related stress, burnout, or related psychological outcomes among EMTs/paramedics, (b) studies addressing risk factors or mitigation strategies, (c) studies in Saudi Arabia or comparable international EMS contexts, (d) English or Arabic publications.
- **Exclusion:** Editorials, opinion pieces, case reports, or studies focusing exclusively on physicians/nurses without EMT involvement.

Study Selection

Two independent reviewers screened titles/abstracts, with disagreements resolved by consensus. Full texts were assessed for eligibility, and data extraction focused on prevalence, risk factors, and interventions.

Quality Appraisal

Quantitative studies were evaluated using the Newcastle–Ottawa Scale (NOS) for observational studies; qualitative studies with the CASP checklist.

Results

PRISMA Flow Sketch (textual)

- **Records identified:** 624
- **Duplicates removed:** 112
- **Titles/abstracts screened:** 512
- **Full-text articles assessed:** 76
- **Studies included:** 24 (7 Saudi-specific; 17 international comparative)

Characteristics of Included Studies

- **Saudi Studies (n=7):** Focused on SRCA paramedics in Riyadh, Makkah, and nationwide surveys. Commonly reported prevalence of stress (30–40%), anxiety (up to 40%), and burnout symptoms. Major predictors: shift work, mission load, inadequate sleep, stimulant use, and traumatic exposure.

- **International Studies (n=17):** From the US, UK, Canada, and Australia, confirming high burnout rates (25–60%) with overlapping risk factors. Interventions trialed included sleep education, fatigue countermeasures, peer support models, and mindfulness programs.

Key Findings

1. **Prevalence:** Moderate-to-high levels of stress and burnout across Saudi EMTs, consistent with global evidence.
2. **Risk Factors:** (a) operational—shift length, irregular schedules, mission load; (b) psychological—poor coping strategies, traumatic events; (c) lifestyle—poor sleep hygiene, caffeine dependence.
3. **Mitigation Strategies:**
 - **Organizational:** fatigue risk management, strategic napping, shift redesign.
 - **Individual:** resilience and mindfulness programs, mobile health interventions.
 - **Social/Peer:** mixed evidence for critical incident stress management (CISM); structured peer support showed better acceptability.

Discussion

Interpretation of Findings

This review shows that EMTs in SRCA experience stress and burnout levels comparable to global peers, with unique cultural and operational stressors (e.g., high mission frequency during mass gatherings like Hajj, reliance on stimulant beverages, and limited structured peer-support services). Consistent with international EMS research, workload, shift work, and traumatic exposure remain the strongest predictors of psychological distress.

Implications for Practice

- **Organizational Level:** Evidence supports implementing shift length restrictions (<24h), mandatory rest periods, and fatigue monitoring systems.
- **Individual Level:** EMTs benefit from resilience and mindfulness training, as demonstrated in controlled trials abroad.
- **Cultural Context:** In Saudi Arabia, interventions should align with Islamic values (e.g., incorporating spiritual well-being into resilience frameworks) and multilingual teams (Arabic, English, Urdu) to maximize accessibility.

Limitations

- Few Saudi studies; most are cross-sectional, limiting causal inference.
- Limited longitudinal or interventional data in the SRCA setting.
- Potential publication bias (English-language dominance).

Future Research

- Rigorous trials of **sleep**-health interventions and digital support apps in Saudi EMTs.
- Evaluation of peer-support models adapted for SRCA (e.g., voluntary, confidential, culturally sensitive).
- Longitudinal studies linking burnout to patient-care outcomes in prehospital settings.

Saudi-Specific Policy Recommendations for SRCA

1. Shift and Fatigue Management

- Cap shifts at ≤ 16 hours; prohibit consecutive 24h duties.
- Pilot fatigue risk management programs (FRMPs) integrated with SRCA's dispatch system.
- Introduce strategic nap rooms at high-volume stations.

2. Structured Peer Support

- Develop a tiered peer-support program (trained EMT peers + referral pathways to mental health professionals).
- Integrate critical incident debriefings with religious/spiritual counseling options for cultural appropriateness.

3. Resilience and Mindfulness Training

- Incorporate resilience modules into SRCA training curricula.
- Test mobile apps for stress monitoring and mindfulness in Arabic/English versions.

4. Sleep and Health Promotion

- Launch sleep hygiene campaigns tailored to shift-workers.
- Provide access to caffeine alternatives and nutritional counseling at SRCA stations.

5. Mass Gathering Preparedness

- Special protocols during Hajj and Umrah seasons, including proactive stress monitoring, increased staffing, and rotation schedules to reduce overload.

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