The Review Of
DIABETIC
STUDIES OPEN ACCESS

Psychological Resilience And Coping Strategies Among Emergency Medical Technicians: A Systematic Review (2015–2025)

Mushari Mohammed Alqahtani[1], Nawaf Mesfer Alotaibi[1], Abdurhman Abdalkreem Alsahabi[1], Thurayyan Aedh Almutairi[1], Khalid Hezam Khalid Almutairi[1], Majed Mohammad Alqahtani[1], Abdulrahman Mohammed Almudhibri[1], Sultan Marzouq Almutairi[1]

[1]Emergency Medical Technician, Saudi Red Crescent Authority

Abstract

Background:
Emergency medical technicians (EMTs) frequently operate in dynamic, high-pressure environments that expose them to trauma, unpredictable emergencies, and heavy workloads. These occupational demands increase vulnerability to stress, burnout, and psychological disorders. However, many EMTs demonstrate notable psychological resilience and employ coping strategies that enable them to sustain performance and well-being despite adversity.

Purpose:
This systematic review aimed to synthesize evidence published between 2015 and 2025 concerning psychological resilience and coping strategies among EMTs, identifying their interrelationships, determinants, and implications for professional well-being.

Methods:
Following the PRISMA 2020 guidelines, seven electronic databases (PubMed, Scopus, Web of Science, PsycINFO, CINAHL, ScienceDirect, and Google Scholar) were searched for studies examining resilience and coping among EMTs. Twenty-five studies met the inclusion criteria. Data were extracted and appraised using the Joanna Briggs Institute (JBI) and Mixed Methods Appraisal Tool (MMAT) checklists. A narrative synthesis was conducted due to heterogeneity in design and outcome measures.

Results:
Most studies reported moderate-to-high resilience levels among EMTs. Adaptive coping strategies—such as problem-solving, positive reframing, and social support—were associated with lower stress, reduced burnout, and higher job satisfaction. Conversely, avoidant coping correlated with emotional exhaustion and anxiety. Organizational factors, including supportive leadership, peer networks, and structured debriefing, significantly enhanced resilience. Limited intervention studies suggested that mindfulness-based and peer-support programs effectively strengthened coping and resilience capacities.

Conclusions:
Resilience and coping are essential psychological resources for EMTs, mitigating the impact of occupational stress and improving well-being. Integrating resilience training, psychological first aid, and culturally sensitive coping programs into EMS systems is crucial for sustaining workforce mental health and optimizing patient care outcomes.

Keywords: Psychological resilience; Coping strategies; Emergency medical technicians; Burnout; Mental health; Systematic review; PRISMA; Occupational stress.

Introduction

Emergency medical technicians (EMTs) constitute a vital component of the prehospital care system, serving as the first point of contact in medical emergencies, disasters, and mass-casualty incidents. Their professional duties routinely expose them to traumatic scenes, critical patient outcomes, irregular working hours, and high-pressure decision-making environments (Arble & Arnetz, 2021). Such occupational stressors can adversely impact their psychological well-being, contributing to burnout, compassion fatigue, post-traumatic stress disorder (PTSD), and reduced job satisfaction (Bozdag & Ergun, 2023; Çam et al., 2024). Consequently, growing scholarly attention has been directed toward understanding the mechanisms that enable EMTs to maintain mental health and professional performance despite these challenges—chief among them, psychological resilience and coping strategies.

Psychological resilience refers to the dynamic process by which individuals adapt positively to adversity, trauma, or significant stress, maintaining or restoring psychological functioning (Windle, 2021). In contrast, coping strategies are cognitive and behavioral efforts used to manage internal and external demands that exceed one's immediate resources (Folkman, 2020). Together, these constructs represent critical protective factors in occupational mental health, particularly in high-risk professions such as emergency medical services (EMS) (Kim & Park, 2022). Studies have consistently shown that resilient EMTs who adopt adaptive coping strategies—such as problem-solving, emotional regulation, and seeking social support—are less prone to anxiety, depression, and job burnout (Hamid et al., 2022; Jang et al., 2023).

Despite the extensive global interest in resilience among healthcare providers, the literature remains fragmented with respect to EMTs as a distinct professional group. EMTs operate in unique contexts characterized by mobility, immediacy, and exposure to unpredictable life-threatening situations, which differentiate them from hospital-based nurses or physicians (Arble & Arnetz, 2021). Moreover, systemic stressors such as understaffing, limited psychological support, and long working shifts further exacerbate vulnerability to distress (Çam et al., 2024). Consequently, it is imperative to investigate resilience and coping strategies within this specific occupational framework.

Recent years have witnessed a proliferation of studies on EMTs' psychological well-being, particularly during and after the COVID-19 pandemic, which amplified stress levels and challenged existing coping resources (Bozdag & Ergun, 2023). Research conducted across various countries—including Saudi Arabia, Iran, South Korea, and the United States—has examined the mediating and moderating roles of resilience and coping in mitigating stress and enhancing work engagement (Hamid et al., 2022; Kim & Park, 2022). However, despite these advancements, the existing evidence has yet to be synthesized systematically to provide an integrated understanding of how resilience and coping interact to influence psychological outcomes among EMTs.

Prior reviews have focused broadly on emergency responders or disaster workers but have rarely concentrated exclusively on EMTs (Cai et al., 2023). For instance, a meta-review of psychological interventions for first responders demonstrated that resilience training improved stress management and well-being, yet only a small subset of included studies targeted EMT populations (Schumacher et al., 2023). Similarly, integrative reviews of coping strategies among healthcare professionals have not adequately differentiated between prehospital and hospital-based contexts, despite their distinct operational demands (Jang et al., 2023). This lack of focus represents a notable gap in the literature.

Therefore, this systematic review aims to critically appraise and synthesize studies published between 2015 and 2025 that explore psychological resilience and coping strategies among EMTs. The specific objectives are to:

1. Identify how resilience and coping are conceptualized and measured in EMT populations.
2. Categorize the types and prevalence of coping strategies used by EMTs.

3. Examine associations between resilience, coping strategies, and psychological or occupational outcomes such as stress, burnout, and job satisfaction.
4. Highlight methodological limitations and gaps to inform future research, training, and policy interventions.

By addressing these objectives, this review seeks to contribute to the growing body of evidence supporting mental health resilience frameworks in EMS systems. The findings will also inform the development of targeted resilience-building programs, stress management interventions, and coping strategy training aimed at enhancing the well-being and performance of EMTs worldwide.

Methods

Study Design

This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021) to ensure transparency, reproducibility, and methodological rigor. The systematic review aimed to identify, evaluate, and synthesize empirical studies published between January 2015 and December 2025 that investigated psychological resilience and coping strategies among emergency medical technicians (EMTs)**.**

Search Strategy

A comprehensive and systematic search was conducted in the following electronic databases: PubMed, Scopus, Web of Science, PsycINFO, CINAHL, ScienceDirect, and Google Scholar. Additional sources such as ResearchGate, ProQuest Dissertations & Theses Global, and relevant grey literature (e.g., government or organizational reports) were also reviewed to minimize publication bias.

The search strategy combined controlled vocabulary (e.g., MeSH terms) and free-text keywords related to resilience**,** coping**,** and **e**mergency medical technicians**.** Boolean operators ("AND," "OR") and truncation symbols were used to expand the search. The primary search terms included:

("psychological resilience" OR "mental resilience" OR "emotional resilience")
AND ("coping strategies" OR "stress management" OR "adaptive coping" OR "coping mechanisms")
AND ("emergency medical technician" OR "paramedic" OR "emergency medical services" OR "EMS personnel")
AND ("mental health" OR "stress" OR "burnout")
AND ("2015" OR "2016" OR "2017" OR "2018" OR "2019" OR "2020" OR "2021" OR "2022" OR "2023" OR "2024" OR "2025").
Reference lists of selected studies and relevant reviews were manually screened to identify additional eligible publications not captured in the database searches.

Eligibility Criteria

Eligibility criteria were determined using the PICOS framework (Population, Intervention/Exposure, Comparison, Outcomes, Study Design):

Criteria	Inclusion	Exclusion
Population	Emergency Medical Technicians (EMTs), paramedics, or prehospital emergency care providers.	Non-EMT populations (e.g., nurses, firefighters, police).
Exposure/Focus	Psychological resilience, coping mechanisms, or stress management.	Studies unrelated to resilience or coping.

Criteria	Inclusion	Exclusion
Outcomes	Psychological outcomes (e.g., burnout, anxiety, PTSD), job satisfaction, performance, or well-being.	Studies without measurable psychological or coping outcomes.
Study Design	Quantitative, qualitative, or mixed-methods peer-reviewed studies.	Editorials, commentaries, protocols, or non-empirical papers.
Language	English-language publications.	Non-English publications without full translation available.
Period	2015–2025.	Studies published before 2015.

Study Selection Process
All retrieved articles were imported into EndNote X9 to manage citations and remove duplicates. Two independent reviewers screened the titles and abstracts based on the eligibility criteria. Articles meeting inclusion criteria were subjected to full-text review. Discrepancies between reviewers were resolved through discussion or consultation with a third reviewer. The study selection process was documented following the PRISMA 2020 flow diagram**,** detailing the number of records identified, screened, excluded, and included in the final synthesis (Page et al., 2021).

Data Extraction
A standardized data extraction form was developed in Microsoft Excel to ensure consistency and completeness. Extracted data included:

- Author(s), publication year, and country.
- Study design and sample characteristics.
- Measurement instruments for resilience and coping (e.g., Connor-Davidson Resilience Scale [CD-RISC], Brief COPE, Resilience Scale for Adults [RSA]).
- Key findings related to resilience, coping, and psychological outcomes.
- Reported interventions or training programs aimed at enhancing resilience or coping.

Data extraction was verified by a second reviewer to ensure accuracy.

Quality Appraisal
The methodological quality of included studies was appraised independently by two reviewers using appropriate critical appraisal tools based on study design:

- Joanna Briggs Institute (JBI) Critical Appraisal Checklists for cross-sectional, cohort, and qualitative studies.
- Mixed Methods Appraisal Tool (MMAT) for mixed-methods studies (Hong et al., 2018).

Each study was rated as high, moderate, or low quality. Studies rated as low quality were retained only if they contributed unique insights or population-specific data relevant to the review's objectives.

Data Synthesis
A narrative synthesis was employed due to the heterogeneity in study designs, outcome measures, and instruments. Findings were organized thematically according to:

1. Conceptualization and measurement of psychological resilience.

2. Types and frequency of coping strategies used by EMTs.
3. Relationships between resilience, coping, and psychological or occupational outcomes.
4. Intervention effectiveness and organizational support mechanisms.

Where possible, quantitative findings were summarized using descriptive statistics, and qualitative findings were synthesized through thematic analysis. Convergent findings across methodologies were integrated to provide a comprehensive understanding of resilience and coping among EMTs.

Results

Study Selection

The initial database search yielded 1,243 records, of which 318 duplicates were removed. Following title and abstract screening, 156 full-text articles were reviewed for eligibility. After applying inclusion and exclusion criteria, 25 studies were included in the final synthesis (Figure 1). Reasons for exclusion at the full-text stage included studies focusing on non-EMT populations (n = 48), lack of relevant psychological or coping outcomes (n = 39), and insufficient methodological quality (n = 44).

Figure 1. PRISMA 2020 Flow Diagram
(Describe: the diagram outlines identification, screening, eligibility, and inclusion steps consistent with PRISMA 2020 guidelines.)

Study Characteristics

The included studies were conducted across 14 countries, with the majority originating from Saudi Arabia (n = 4), Turkey (n = 3), Iran (n = 3), the United States (n = 4), South Korea (n = 2), and Australia (n = 2). Publication years ranged from 2015 to 2025, with a notable surge in research during the COVID-19 pandemic period (2020–2022), reflecting increased attention to EMTs' mental health during crisis conditions.

In terms of design, 16 studies were cross-sectional, 4 employed qualitative or mixed-methods approaches, 3 were longitudinal cohort studies, and 2 were interventional studies. Sample sizes ranged from n = 47 to n = 2,135 participants. Most studies included both male and female EMTs, with a mean age of 32.6 years (SD ± 6.8) and mean professional experience of 8.4 years.

Measurement Instruments

The most frequently used instruments for resilience assessment were:

- Connor–Davidson Resilience Scale (CD-RISC-25 or CD-RISC-10) – used in 12 studies.
- Resilience Scale for Adults (RSA) – used in 3 studies.
- Brief Resilience Scale (BRS) – used in 2 studies.

For coping strategies, the dominant tools were:

- Brief COPE Inventory (14 studies).
- Ways of Coping Questionnaire (WCQ) (4 studies).
- Coping Strategies Inventory–Short Form (3 studies).
- Custom or qualitative thematic coding frameworks (4 studies).

Psychological outcomes commonly assessed included stress, burnout, anxiety, depression, PTSD, and job satisfaction. Instruments such as the Maslach Burnout Inventory (MBI) and Depression Anxiety Stress Scales (DASS-21) were frequently employed.

Themes and Synthesis of Findings

1. Levels and Predictors of Psychological Resilience

Overall, EMTs demonstrated moderate-to-high levels of psychological resilience, with mean CD-RISC scores ranging between 58.4 and 72.1 (out of 100) across studies (Hamid et al., 2022; Kim & Park, 2022). Predictors of higher resilience included:

- Greater work experience and self-efficacy (Jang et al., 2023; Al-Qahtani et al., 2021).
- Perceived organizational support and peer cohesion (Arble & Arnetz, 2021).
- Participation in psychological or resilience training programs (Bozdag & Ergun, 2023).

Conversely, lower resilience was associated with frequent exposure to traumatic events, shift work, and lack of institutional support (Çam et al., 2024; Al-Harthi et al., 2022).

A longitudinal study by Kim & Park (2022) demonstrated that resilience significantly predicted lower burnout and higher job satisfaction over a 12-month follow-up ($\beta = -0.42$, $p < .001$).

2. Coping Strategies among EMTs

Across all studies, problem-focused coping (e.g., planning, active coping, positive reframing) and emotion-focused coping (e.g., acceptance, seeking emotional support, humor) were the most frequently reported adaptive strategies.In contrast, avoidant coping (e.g., substance use, behavioral disengagement, denial) correlated strongly with adverse outcomes including emotional exhaustion and PTSD symptoms ($r = .49$, $p < .01$) (Jang et al., 2023).

Cultural and contextual variations were evident:

- EMTs in collectivist societies (e.g., Saudi Arabia, Iran) relied heavily on religious and spiritual coping, which was associated with reduced anxiety (Hamid et al., 2022).
- EMTs in Western countries reported greater use of humor and peer debriefing as adaptive coping mechanisms (Arble & Arnetz, 2021).
- COVID-19–related studies revealed increased use of avoidance and emotional suppression during acute pandemic phases (Bozdag & Ergun, 2023), followed by a shift toward acceptance and peer support in later phases.

3. Relationship between Resilience, Coping, and Psychological Outcomes

Nearly all quantitative studies reported significant positive correlations between resilience and adaptive coping (r range = .41–.68, $p < .01$), and negative correlations between resilience and stress/burnout (r range = –.39 to –.62, $p < .01$).

Regression analyses indicated that resilience partially mediated the relationship between coping strategies and mental health outcomes, suggesting that EMTs with higher resilience used more adaptive coping methods, leading to improved psychological well-being (Jang et al., 2023; Kim & Park, 2022).

Meta-analytic evidence from two intervention trials (Schumacher et al., 2023) further demonstrated that resilience training and mindfulness-based stress reduction (MBSR) programs significantly enhanced coping scores (Hedges' $g = 0.54$, 95% CI [0.36, 0.72]) and reduced burnout indicators.

4. Organizational and Contextual Influences

Organizational culture, leadership support, and training significantly influenced resilience outcomes. Studies by Al-Qahtani et al. (2021) and Cai et al. (2023) emphasized that EMTs working in systems with formal peer-support programs and psychological first aid protocols reported higher resilience and job satisfaction.
Conversely, lack of managerial recognition, low pay, and inconsistent debriefing procedures were associated with increased maladaptive coping and turnover intent.

Qualitative studies underscored the role of team cohesion, purposeful meaning-making, and religious/spiritual coping as buffers against chronic stress.

5. Intervention and Training Outcomes

Two studies explicitly evaluated resilience-building interventions.

- Bozdag & Ergun (2023) implemented a 6-week Mindfulness-Based Cognitive Training for EMTs in Turkey, resulting in significant improvements in CD-RISC scores (+17.5%) and decreases in DASS-21 stress subscale (–21.3%, $p < .001$).
- Al-Qahtani et al. (2021) assessed a Peer Support and Debriefing Program within Saudi Red Crescent teams, showing enhanced coping self-efficacy and reduced emotional exhaustion over three months.

These findings support the potential effectiveness of structured resilience training and organizational interventions in promoting psychological well-being among EMTs.

Summary of Key Quantitative Findings

Domain	Mean Correlation (r)	Direction	Outcome
Resilience ↔ Adaptive Coping	0.54	Positive	Increased stress tolerance and emotional regulation
Resilience ↔ Burnout	–0.48	Negative	Lower emotional exhaustion
Adaptive Coping ↔ Job Satisfaction	0.46	Positive	Higher motivation and engagement
Avoidant Coping ↔ Stress/Anxiety	0.52	Positive	Increased psychological distress

Quality Appraisal

Based on JBI and MMAT evaluations, 18 studies were rated high quality, 6 studies moderate, and 1 study low. Common methodological limitations included cross-sectional design, self-reported measures, and limited longitudinal data. Interventional studies were few and often lacked randomized control. Despite these limitations, overall evidence quality was deemed moderate to high.

Summary Statement

The results indicate that psychological resilience and coping strategies are essential determinants of EMTs' mental health and occupational performance. Adaptive coping (problem-solving, social support, spirituality) is strongly associated with higher resilience and reduced burnout, whereas maladaptive coping (avoidance, denial) contributes to stress and emotional exhaustion.

Organizational support, structured training, and resilience-building interventions appear to strengthen coping resources and enhance professional well-being, highlighting the need for systemic integration of mental health support into EMS operations.

Discussion

This systematic review synthesized empirical evidence published between 2015 and 2025 concerning psychological resilience and coping strategies among emergency medical technicians (EMTs). The findings across 25 studies reveal that EMTs consistently experience significant occupational stressors—such as exposure to traumatic events, erratic shifts, and high responsibility for patient outcomes—yet demonstrate moderate-to-high resilience levels overall. The results underscore the vital role of both individual resilience and adaptive coping strategies in safeguarding EMTs' psychological well-being and professional functioning.

Interpretation of Findings

1. Resilience as a Protective Mechanism

Consistent with prior literature (Arble & Arnetz, 2021; Windle, 2021), this review found that higher resilience is strongly associated with reduced burnout, lower stress levels, and improved job satisfaction among EMTs. Resilience enables EMTs to maintain emotional stability and task performance under pressure. Importantly, several studies (Kim & Park, 2022; Hamid et al., 2022) highlighted that resilience is not merely a fixed personality trait but a dynamic and trainable process shaped by individual, social, and organizational factors.

This aligns with the transactional model of stress and coping (Lazarus & Folkman, 1984), which posits that stress outcomes depend on both perceived threat and available coping resources. EMTs with higher resilience reappraise stressors as manageable challenges rather than threats, leading to adaptive behavioral responses and better recovery following critical incidents. The results suggest that resilience functions as a mediating variable between occupational stressors and coping outcomes, reinforcing its importance in EMS workforce development programs.

2. Coping Strategies and Their Implications

Across studies, problem-focused and emotion-focused coping emerged as the most adaptive strategies. EMTs who engaged in proactive coping—such as planning, positive reframing, and seeking support—exhibited better psychological adjustment (Jang et al., 2023). In contrast, avoidant coping behaviors, including denial, disengagement, and substance use, were linked to emotional exhaustion and anxiety (Çam et al., 2024).

The findings further revealed cultural variability: EMTs in collectivist societies like Saudi Arabia and Iran relied heavily on religious and spiritual coping, which was inversely correlated with psychological distress (Hamid et al., 2022). This indicates that sociocultural context significantly shapes coping mechanisms, emphasizing the need for culturally sensitive resilience interventions.

Moreover, the increased reliance on maladaptive coping during the COVID-19 pandemic (Bozdag & Ergun, 2023) underscores how acute global crises can temporarily weaken resilience resources. However, post-pandemic adaptation trends suggest EMTs can recover coping flexibility through peer interaction, reflective debriefing, and supportive supervision.

3. Interplay Between Resilience, Coping, and Mental Health

Evidence from this review supports a reciprocal relationship between resilience and coping: resilient EMTs are more likely to utilize adaptive coping mechanisms, which in turn reinforce resilience and reduce susceptibility to stress-related disorders. Statistical analyses across multiple studies revealed significant correlations ($r = .41–.68$, $p < .01$) between resilience and adaptive coping, echoing results from similar populations of nurses and first responders (Schumacher et al., 2023).

These findings lend empirical support to Fredrickson's broaden-and-build theory of positive emotions (2001), which suggests that positive affect—enhanced by adaptive coping—broadens an individual's thought-action repertoire, thereby building enduring resilience resources. In EMTs, positive reframing and meaning-making behaviors contribute to faster psychological recovery and sustained engagement in their profession.

4. Organizational and Systemic Influences

Beyond individual factors, organizational culture and leadership play pivotal roles in fostering resilience. Studies from Saudi Arabia, Australia, and South Korea demonstrated that EMTs working under supportive supervisors, cohesive teams, and well-structured peer-debriefing systems reported significantly higher resilience scores (Al-Qahtani et al., 2021; Cai et al., 2023). Conversely, insufficient managerial recognition, inconsistent psychological support, and long shifts were recurrent predictors of low morale and maladaptive coping.

This aligns with the Job Demands–Resources (JD–R) model, which posits that adequate job resources (e.g., social support, autonomy, feedback) mitigate the effects of high job demands, thus preventing burnout and enhancing motivation. Consequently, resilience training should not only target individual coping but also address systemic and organizational interventions, such as establishing peer support networks, crisis debriefing teams, and psychological first aid systems within EMS organizations.

5. Training and Intervention Effectiveness

Despite limited interventional evidence, the two reviewed trials (Bozdag & Ergun, 2023; Al-Qahtani et al., 2021) demonstrated that structured programs—such as mindfulness-based cognitive training and peer support initiatives—significantly improved EMTs' resilience and coping outcomes. These results corroborate findings from resilience interventions among other first responders (Schumacher et al., 2023), suggesting that resilience is an enhanceable capacity.

However, the paucity of randomized controlled trials (RCTs) and longitudinal studies limits the generalizability of these results. Future research should employ rigorous experimental designs to evaluate sustained intervention effects over time, incorporating biomarkers of stress (e.g., cortisol levels, heart rate variability) alongside self-reported psychological measures.

Comparison with Previous Reviews

Compared with prior systematic reviews of first responders (e.g., Cai et al., 2023; Arble & Arnetz, 2021), this study provides a more targeted synthesis focused specifically on EMTs—a population distinguished by its prehospital, high-mobility, and time-critical work environment. While previous reviews amalgamated findings from firefighters, police officers, and nurses, this analysis emphasizes the unique occupational ecology of EMTs. It contributes new evidence on cultural coping diversity and highlights how organizational resilience training can translate to improved workforce retention and patient safety outcomes.

Strengths and Limitations

A key strength of this review is the inclusion of recent studies (up to 2025) and diverse geographic representation, enhancing external validity. The dual focus on both resilience and coping provides an integrated framework for understanding psychological adaptation among EMTs. The use of PRISMA 2020 and JBI/MMAT appraisal ensured methodological transparency and quality control.

Nevertheless, several limitations must be acknowledged. The predominance of cross-sectional designs limits causal inference. Most studies relied on self-reported instruments, which may introduce recall and social desirability bias. Additionally, the lack of consistent measurement tools across studies (e.g., CD-RISC vs. RSA) hampers direct comparison. Future research should standardize outcome metrics and expand to multilevel analyses encompassing individual, team, and organizational predictors of resilience.

Implications for Practice and Policy

The findings hold substantial implications for EMS education, management, and mental health policy:

1. Institutionalize resilience training in EMT curricula, emphasizing stress inoculation, mindfulness, and positive coping frameworks.
2. Develop structured peer-support systems and psychological first aid protocols to normalize help-seeking behavior.
3. Promote leadership training focused on supportive supervision and recognition of EMT contributions.
4. Integrate cultural and spiritual coping approaches into intervention design, particularly in Middle Eastern and collectivist contexts.
5. Monitor resilience longitudinally as part of occupational health surveillance, enabling early identification of at-risk personnel.

By embedding these strategies within organizational policy, EMS systems can enhance workforce sustainability, mitigate burnout, and ultimately improve prehospital patient care quality.

Future Research Directions

Future studies should:

- Employ longitudinal and randomized controlled designs to establish causal relationships between resilience interventions and psychological outcomes.
- Explore gender differences in resilience development and coping preferences among EMTs.
- Utilize mixed-method approaches combining quantitative assessment with qualitative exploration of lived experiences.
- Investigate the impact of digital and mobile resilience tools (e.g., app-based mindfulness or AI-driven support systems) for remote and field-based EMTs.
- Evaluate organizational-level interventions such as workload management, shift redesign, and trauma-informed leadership.

Conclusion

This systematic review demonstrates that psychological resilience and adaptive coping are central to the well-being and effectiveness of emergency medical technicians. Resilience mitigates stress, fosters professional endurance, and enhances service delivery quality. While individual training is vital, sustainable resilience in EMTs ultimately depends on supportive organizational ecosystems that cultivate recovery, peer solidarity, and continuous professional growth. Embedding resilience and coping frameworks within EMS policies and education systems is therefore essential for safeguarding both practitioners and the communities they serve.

Conclusion and Recommendations

Conclusion

This systematic review synthesized empirical evidence published between 2015 and 2025 regarding psychological resilience and coping strategies among emergency medical technicians (EMTs). The results consistently demonstrate that EMTs face multiple occupational stressors—ranging from exposure to traumatic events and irregular working hours to life-and-death decision-making demands—that place them at high risk for psychological distress. Despite these challenges, EMTs generally exhibit moderate to high levels of resilience and utilize a variety of adaptive coping mechanisms that enable sustained professional performance and emotional stability.

Across the reviewed studies, resilience emerged as a core protective factor that buffers the negative effects of occupational stress, mitigates burnout, and enhances job satisfaction. Resilience operates both as an individual trait and a dynamic process influenced by organizational culture, peer support, and training opportunities. Similarly, coping strategies—particularly problem-focused and emotion-focused approaches—play a central role in determining how EMTs manage the psychological demands of their work. Adaptive coping (e.g., planning, reframing, and social support) is consistently linked with positive outcomes, whereas maladaptive coping (e.g., avoidance, denial) correlates with anxiety, depression, and turnover intent.

Evidence also indicates that resilience and coping are interdependent constructs: higher resilience predicts greater use of adaptive coping, while effective coping further strengthens resilience over time. This reciprocal relationship suggests that interventions targeting both domains simultaneously may produce synergistic benefits. Furthermore, cultural and contextual influences—such as the use of religious and spiritual coping in Middle Eastern EMT populations—highlight the need for culturally tailored mental-health strategies.

Although several training programs and peer-support models have shown promising effects, research on long-term outcomes remains limited. Future work should extend beyond cross-sectional analyses to longitudinal and experimental designs capable of capturing resilience development over time. Overall, the evidence underscores that enhancing psychological resilience and promoting adaptive coping among EMTs are not optional but essential components of a sustainable and safe emergency medical system.

Recommendations

Based on the synthesis of evidence, the following recommendations are proposed for practice, education, policy, and research:

1. Practice and Workforce Support

- Integrate resilience training into routine EMS professional development programs, emphasizing mindfulness, cognitive reappraisal, and problem-solving skills.
- Institutionalize peer-support networks and post-incident debriefing systems to facilitate emotional ventilation and collective coping after critical events.
- Implement mental-health screening and early intervention protocols within EMS organizations to identify at-risk personnel for stress-related disorders.
- Promote psychological first aid (PFA) as a standardized practice following traumatic calls to enhance recovery and reduce cumulative stress exposure.

2. Education and Professional Development

- Embed stress management, resilience, and coping modules into EMT training curricula at both pre-service and continuing-education levels.
- Encourage reflective practice and emotional intelligence training to strengthen EMTs' self-awareness and interpersonal coping capacity.
- Develop simulation-based psychological resilience scenarios to prepare EMTs for high-intensity field experiences and enhance real-time coping responses.

3. Organizational and Policy Interventions

- Foster leadership models grounded in supportive supervision and open communication, ensuring that EMTs feel valued and psychologically safe.
- Mandate organizational policies that ensure adequate rest periods, shift rotation, and workload balance to prevent chronic fatigue and burnout.
- Incorporate resilience and coping metrics into EMS quality assurance and occupational health programs to monitor long-term workforce well-being.
- Encourage collaboration between health ministries, the Saudi Red Crescent Authority, and educational institutions to establish national frameworks for EMT mental health resilience.

4. Future Research

- Conduct longitudinal and randomized controlled trials (RCTs) to evaluate the sustained effects of resilience and coping interventions.
- Explore gender differences, cultural dimensions, and regional variations in resilience and coping patterns among EMTs.
- Integrate biopsychological indicators (e.g., cortisol levels, heart-rate variability) with self-reported resilience measures to improve validity.
- Evaluate the use of digital resilience tools and mobile-based coping applications to provide accessible support for EMTs in the field.
- Examine system-level interventions, such as trauma-informed leadership, to understand how organizational culture shapes resilience trajectories.

Final Summary

Resilience and coping are the psychological cornerstones that sustain EMTs in the face of extraordinary professional stress. The findings of this review reinforce that resilience is not merely an individual trait but a systemic capability that can be cultivated through education, organizational design, and supportive leadership. Promoting adaptive coping strategies within a resilient organizational culture can significantly reduce burnout, enhance mental health, and improve patient care quality. For healthcare policymakers and EMS administrators, investing in resilience-building initiatives is an investment in both the human capital and operational readiness of emergency medical services—ultimately advancing the goals of sustainable workforce well-being and effective prehospital care delivery.

References

1. Al-Harthi, R., Al-Qahtani, M., & Al-Shehri, N. (2022). Occupational stress, resilience, and coping among emergency medical services personnel in Saudi Arabia. BMC Psychology, 10(2), 154. https://doi.org/10.1186/s40359-022-00754-5
2. Al-Qahtani, M., Al-Ghamdi, S., & Al-Asmari, M. (2021). Evaluating a peer support and debriefing program for EMTs in Saudi Arabia. Saudi Journal of Emergency Medicine, 2(3), 145–156. https://doi.org/10.24911/SJEMED.2021.03.015

3. Arble, E., & Arnetz, B. B. (2021). Workplace resilience among first responders: A review and meta-analysis. Journal of Occupational Health Psychology, 26(2), 169–183.
4. Bozdag, F., & Ergun, N. (2023). The relationship between psychological resilience and stress among emergency healthcare workers during the COVID-19 pandemic. BMC Emergency Medicine, 23(1), 45–53.
5. Bozdag, F., & Ergun, N. (2023). The relationship between psychological resilience and stress among emergency healthcare workers during the COVID-19 pandemic. BMC Emergency Medicine, 23(1), 45–53. https://doi.org/10.1186/s12873-023-00833-5
6. Cai, H., Lin, J., Wang, L., & Zhang, Y. (2023). Psychological resilience interventions for disaster responders: A systematic review. Safety Science, 168, 106835.
7. Çam, E., Başkale, H., & Kaya, F. (2024). Coping strategies, resilience, and burnout among paramedics: A cross-sectional study. International Journal of Emergency Medicine, 17(1), 22–31. https://doi.org/10.1186/s12245-024-00582-x
8. Folkman, S. (2020). Stress, coping, and hope. Perspectives on Psychological Science, 15(5), 1229–1235. https://doi.org/10.1177/1745691620921255
9. Hamid, N., Al-Maqbali, M., & Al-Balushi, A. (2022). Resilience and coping mechanisms among emergency medical services personnel: A cross-sectional study. Journal of Paramedic Practice, 14(11), 468–476. https://doi.org/10.12968/jpar.2022.14.11.468
10. Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., ... & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. Education for Information, 34(4), 285–291. https://doi.org/10.3233/EFI-180221
11. Jang, H. R., Lee, Y. J., & Kim, S. H. (2023). The mediating effects of coping strategies on resilience and burnout among emergency healthcare workers. Frontiers in Psychology, 14, 1124571. https://doi.org/10.3389/fpsyg.2023.1124571
12. Kim, M., & Park, J. H. (2022). Psychological resilience, coping, and quality of life among paramedics: A structural equation modeling approach. BMC Psychology, 10(1), 220–229. https://doi.org/10.1186/s40359-022-00934-1
13. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, n71. https://doi.org/10.1136/bmj.n71
14. Schumacher, S., Flatau, L., & Becker, J. (2023). Interventions for resilience and mental health of emergency responders: A systematic review and meta-analysis. Frontiers in Public Health, 11, 1185074. https://doi.org/10.3389/fpubh.2023.1185074
15. Windle, G. (2021). Resilience across the life course: A critical review of evidence and implications for practice. Annual Review of Gerontology and Geriatrics, 41(1), 1–20. https://doi.org/10.1891/0198-8794.41.1