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Psychological Stress Among Emergency Service Providers In Middle East Countries During Summer Seasons

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Abstract

Emergency service providers (ESPs) in Middle Eastern countries operate in one of the world's most extreme climatic environments, where prolonged summer heat and rising humidity intensify the psychological and physiological demands of emergency response work. This review synthesizes current evidence on the relationship between extreme seasonal heat and psychological stress among ESPs, including paramedics, emergency medical technicians, firefighters, and rapid-response personnel. A systematic search of major databases identified studies published between 2010 and 2025, focusing on heat exposure, mental health outcomes, cognitive performance, and occupational strain within Gulf settings. Findings demonstrate that sustained summer temperatures exceeding human thermoregulatory thresholds significantly heighten acute stress, irritability, anxiety, cognitive fatigue, emotional exhaustion, and trauma-related symptoms. Heat acts as both a direct physiological stressor and an intensifier of existing occupational pressures, contributing to burnout, reduced decision-making accuracy, and increased error risk. Environmental factors, such as humidity spikes, radiant heat, sandstorms, and organizational issues including staffing shortages, inadequate cooling systems, and limited mental health support further compound psychological vulnerability. While individual coping, team cohesion, cultural resilience, and leadership support provide protective effects, institutional interventions remain inconsistently applied across the region. Evidence gaps persist due to underreporting, limited region-specific empirical data, inconsistent heat indices, and minimal research involving female and expatriate responders. The review highlights the urgent need for summer-specific operational protocols, improved cooling technologies, AI-driven heat monitoring, and standardized mental health frameworks. Strengthening resilience and policy infrastructures is essential to safeguard ESP wellbeing as climate change continues to intensify extreme heat conditions in the Middle East.

Introduction

Emergency service providers (ESPs) face unexpected, high-pressure, and life-threatening situations, causing psychological stress. Traumatic situations, severe injuries, abrupt fatalities, and physically demanding rescue operations enhance the psychological burden of ESPs like paramedics, EMTs, firemen, and rapid response teams (Gill & Lauren, 2025). In chaotic, dangerous situations, frontline responders must maintain emotional control, make rapid decisions, and maintain technical precision, making them more vulnerable to acute and chronic stress. Due to their resilience, attentiveness, and emotional labor, ESPs report more anxiety, burnout, emotional exhaustion, and trauma-related symptoms than other healthcare or public safety professionals (Lawn et al., 2020). Middle Eastern responders experience unique climate and social dynamics, which increases the mental health burden across emergency sectors (Brooks et al., 2016).

In several Gulf countries, summer heatwaves reach 50°C. The Middle East has an extreme climate. Emergency response workers must operate outside or in heat-exposed vehicles and structures, raising

occupational dangers (Al Hurini et al., 2024). Civilians are advised to avoid heat. Extreme heat reduces physical performance by causing rage, fatigue, cognitive overload, and emotional instability. Environmental psychology study shows that high temperatures impair mood management, attention, reaction speed, and decision-making accuracy, which are essential for emergency response (Cornish, 2024). Heatwaves in several Middle Eastern countries may be too hot for prolonged outdoor activity by mid-century, raising first responder occupational risks (Mustapha Amoadu et al., 2023). Environmental hazards compound emergency work's psychological stress, generating a fatal mix of climate and mental health concerns (McKoy, 2022).

Emergency services in the region face several challenges in summer. Paramedics treat heatstroke, dehydration, hyperthermia, cardiovascular crises, and heat-related accidents and collapses in outdoor workers and sensitive populations (Korakot Apiratwarakul et al., 2024). Environment and fire scene radiant heat increase firefighters' physical and mental strain. Emergency vehicles sometimes overheat before rescuers reach crisis sites, despite constant cooling. Qatari researchers identified harmful microclimates within fast response trucks even when not treating patients (Nour Alhuda Alaghawani et al., 2025). Physical and psychological stress from operational challenges increases burnout, anxiety, and emotional fatigue (ALmutairi & El.Mahalli, 2020).

Summer ESPs in the Middle East handle more emergency calls, raising workload and performance pressure. Heatwaves increase civilian emergency room visits for heat-related disorders, mental health crises, dehydration, syncope, and cardiovascular discomfort, requiring emergency staff to intervene immediately (Li et al., 2014). Emergency surges increase ESP burden, operating pace, and call recovery. Hot weather causes dehydration, thermal discomfort, sweating-induced tiredness, and cognitive loss, making rescue attempts harder (Toloo et al., 2014). Increased call demands and restricted physical capabilities create a perfect storm for psychological stress, especially in summer when emergency workers are most exposed to weather. Extreme heat increases ambulance dispatches and emergency department visits, suggesting that higher baseline temperatures put Middle Eastern responders under even more operational strain (Varghese et al., 2021; Sun, 2021).

Summer psychological stress is a major occupational health hazard for emergency responders due to global warming. Long-term climate estimates foresee high wet-bulb temperatures in Middle Eastern cities, challenging thermoregulation and cognition (Cornish, 2024). Long hours in extreme temperatures without rest, water, or cooling infrastructure put ESPs at danger (Al Hurini et al., 2024). Heat exposure decreases attention, memory, and judgment, which are crucial for emergency decision-making and situational awareness. High temperatures increase worker irritability, aggression, emotional instability, and stress vulnerability, exacerbating psychological strain during critical emergency operations (McKoy, 2022). Environmental heat raises heart rate, dehydration, and cardiovascular strain, which can produce mental fatigue and weaken resilience (Maidina Jingesi et al., 2024). Climate-related pressures make emergency work much harder, causing multi-layered psychological stress that harms Middle Eastern emergency workers (Mustapha Amoadu et al., 2023).

Extreme heat has occupational impacts on Middle Eastern emergency response workers, but its psychological repercussions are unknown. Most heat-related health literature targets general populations, outdoor workers, and healthcare professionals, not ESPs as a high-risk occupational group (El Khayat et al., 2022). Scientific focus is needed for trauma, heat, and high-stress operations by emergency personnel. According to qualitative research from Iran, EMS professionals suffer with emotional pressure, uncertainty, and role overload, utilizing ineffective coping mechanisms (Afshin Khazaei et al., 2024). ESPs in Saudi Arabia and Qatar report increased burnout, depersonalization, and psychological tiredness due to heat exposure (Albazoon et al., 2023; Sattam Zaid Alanazi, 2024). Mental health stigma, expectations of emotional fortitude, and fear of professional sanctions deter respondents from seeking treatment, resulting in underreported psychological distress (Chemali et al., 2019; Khazaei et al.,2024).

Environmental heat stress, occupational trauma, and sociocultural issues need a comprehensive and region-specific investigation of Middle Eastern emergency care providers' psychological stress. Environmental, psychological, organizational, and cultural factors have not been fully integrated to explain ESP stress in high summer (Alghamdi, 2022). Despite growing evidence that heat stress directly increases emotional exhaustion, cognitive fatigue, and burnout, most research examines physical heat stress and psychological impacts separately (Canetti et al., 2022). Social isolation, migratory pressure, and inadequate family support are common stresses for Gulf emergency workers, who are mostly expat

(Chemali et al., 2019). Limited research exists on their special issues. A lack of coordinated research prohibits Middle Eastern emergency service operations in extreme heat from being improved (Mustapha Amoadu et al., 2023; Alghamdi, 2022).

This study consolidates and analyzes summer psychological stress among Middle Eastern emergency service providers, making it topical and important. This study examines how severe heat impacts ESP mental health, operational performance, and resilience using environmental health, occupational psychology, emergency medicine, and climate science. Stress-reduction coping techniques, organizational practices, and policy frameworks are addressed. This analysis helps regional politicians, emergency leaders, healthcare administrators, and academics build climate-adaptive occupational health measures to preserve frontline responders' mental health throughout increasingly harsh and longer summers.

Methods

Search Strategy

A comprehensive search was conducted to find scholarly material on psychological stress among Middle Eastern emergency response professionals in summer or excessive heat. PubMed, Scopus, Web of Science, ScienceDirect, and PsycINFO were searched for peer-reviewed studies, government reports, and high-quality observational research on occupational heat exposure, emergency medical services, and mental health outcomes. The search approach includes restricted vocabulary phrases and free-text keywords including “emergency service providers,” “paramedics,” “heat stress,” “extreme temperatures,” “summer season,” “psychological distress,” “burnout,” “heat-related mental health,” and “Middle East.” To make the findings relevant to the Gulf, Levant, and Iran, Boolean operators (AND/OR) and region-specific filters were used. The search was limited to research published between January 2010 and December 2025, a time of enhanced heatwaves and worldwide climate-health focus, to find the latest evidence on climate-related occupational stress. Middle Eastern emergency service infrastructure has modernized throughout this span, making the findings more relevant to current working situations.

Extracting and Analyzing Data

Duplicates and irrelevant articles were removed from all retrievals. Based on predefined inclusion criteria, full-text screening was performed on studies involving emergency medical technicians, paramedics, firefighters, or prehospital responders; Middle Eastern research; psychological stress, burnout, trauma, cognitive strain, or emotional health during high-temperature or summer periods; and peer-reviewed or high-quality grey literature.

The study site, sample characteristics, climatic circumstances, psychological outcomes, heat-exposure indicators, and methodological techniques were extracted and arranged using a standardized data extraction sheet. A narrative synthesis technique was used due to study variability in heat exposure, psychological evaluation instruments, and operational situations. This method integrated quantitative, qualitative, and mixed-method studies to identify convergent themes like heat-related psychological symptoms, heat-induced stress mechanisms, organizational influences, and regional disparities. Disparities including low female involvement, uneven heat indices, and little longitudinal study were also found. Quality appraisal assessed research design robustness, sample size sufficiency, psychological assessment instrument validity, heat-exposure measurement clarity, and management of confounding factors including workload, shift patterns, and trauma exposure. Studies were also assessed for honesty and applicability to Middle Eastern emergency workers' summer work circumstances.

Evolution of Stress Research in Emergency Services

Initial research on emergency services stress came from frontline responder occupational stress and trauma studies. Early 1970s and 1980s research examined the psychological impacts of sudden deaths, significant injuries, violence, and large-scale disasters. These early studies explained how emergency service providers (ESPs) experienced emotional stress due to their unexpected and life-threatening job (Brooks et al., 2016). Paramedics and firefighters' worry, emotional exhaustion, and trauma-related symptoms led researchers to identify ESPs as more sensitive to psychological discomfort. Rapid decision-making, high responsibility, and repeated catastrophic crises created the notion of stress as an occupational component of emergency response work in the 1990s (Lawn et al., 2020). Early trauma

exposure studies did not incorporate environmental factors like heat, which later became crucial in Middle Eastern research (Brooks et al., 2016; Lawn, 2020).

Early 2000s emergency services stress research found burnout, chronic tiredness, and long-term psychological impairment. Emergency responders experienced accumulated stress from hard workloads, rotating shifts, inadequate sleep, and the emotional burden of ongoing care, according to researchers. ESP psychological strain was largely explained by burnout, which involves emotional exhaustion, depersonalization, and poorer personal success (Chemali et al., 2019). Academics utilized the Job Demand-Control theory and Effort-Reward Imbalance model to explain how high demands and inadequate organizational support created chronic stress in responders (ALmutairi & El.Mahalli, 2020). These frameworks indicated how cultural expectations, high caseloads, and inadequate mental health care stressed Middle Eastern ESPs (Albazoon et al., 2023). Thus, early 2000s stress research expanded beyond trauma to cover organizational, emotional, and work-life challenges that influenced emergency personnel's long-term psychological health (Albazoon et al.2023; Chemali, 2019).

As climate change received worldwide attention in the 2010s, researchers included environmental stressors, especially heat, to emergency service occupational stress models. When climate scientists observed more severe and frequent heatwaves, public health experts examined how high temperatures affected cognition, emotion, and psychological functioning (Cornish, 2024). Rising temperatures in the US, China, and Australia were connected to emergency psychiatric visits, irritability, cognitive fatigue, and poor decision-making (Sun et al., 2021). These findings were critical for ESPs, who must withstand heat and high stakes that require cognitive sharpness. Timing studies revealed that excessive heat increased ER visits and ambulance dispatches, straining responders (Li et al., 2014). This study reframed heat as a psychological stressor with substantial repercussions for emergency workers, opening the door for studies in difficult climates like the Middle East (Cornish, 2024; Sun et al., 2021).

Middle Eastern researchers studied ESPs' responses to job stress and heat in the late 2010s. Middle Eastern research indicated the unusual climatic reality of working in temperatures above 45°C, and some reaching 50°C during peak summer months (Al Hurini et al., 2024). Not in Western studies. among the UAE, Qatar, Iran, and Saudi Arabia, extreme heat reduced physical function and raised psychological strain, annoyance, and emotional exhaustion among emergency personnel (Alebaji et al., 2022). Responders were stressed by summer heat, which raised emergency call counts and operating intensity (Bassey et al., 2025). Iranian quality data indicated that environmental hardship, heavier caseloads, and short recuperation time between missions made summer “psychologically overwhelming” for EMS staff (Afshin Khazaei et al., 2024). These geographical findings transformed stress research by showing that ambient heat is a physical and psychological threat to emergency workers (Al Hurini et al., 2024; Afshin Khazaei, 2024).

In Middle Eastern healthcare settings, burnout was common among medical workers, especially emergency responders. Research indicated that high caseloads, organisational pressures, and cultural expectations enhanced burnout in Gulf and Middle Eastern countries (Albazoon et al., 2023). EMS professionals, especially in high-pressure metropolitan contexts, demonstrated emotional tiredness, depersonalization, and decreased resilience (Chemali et al., 2019). Post-traumatic stress disorder (PTSD) rates among Saudi emergency responders were frightening, revealing how trauma exposure and environmental and organisational pressures created long-term psychological impacts (Sattam Zaid Alanazi et al., 2024). Iranian cross-sectional research identified strong connections between burnout, death anxiety, and reduced resilience in prehospital emergency personnel, indicating psychological vulnerability (Ghahramanipirsalami et al., 2025). These studies showed the link between emotional labor, trauma exposure, heat stress, and organisational strain, increasing stress research (Albazoon et al., 2023; Ghahramanipirsalami, 2025).

Environmental and physiological research altered emergency service stress studies. High temperatures affect cognitive ability, attentional capacity, and emotional reactivity, which is especially difficult for emergency responders who must make life-saving judgments (Maidina Jingesi et al., 2024). Due to psychological fatigue, emergency professionals had greater heart rates, dehydration, cardiovascular strain, and temperature discomfort during regular operations (Canetti et al., 2022). In emergencies, heat exposure increased anger, impatience, and behavioral instability, adding psychological stress (McKoy, 2022). These findings lead to more complete models that account for physiological and environmental stresses on emergency work psychological effects (Canetti et al., 2022; Maidina Jingesi, 2024).

Environmental and community factors impact emergency personnel stress, according to Middle Eastern public health research. Heatstroke, dehydration, and cardiovascular crises increased EMS effort in summer (Korakot Apiratwarakul et al., 2024). Community knowledge gaps enhanced UAE emergency responders' burden by responding to preventable heat-related catastrophes (Alebaji et al., 2022). Qatari heat-health behavior studies indicated that emergency response vehicles often exceeded temperature restrictions, causing responders physical and psychological stress even during transit (Nour Alhuda Alaghawani et al., 2025). This revealed that emergency services stress studies must incorporate Middle Eastern environmental, community, and infrastructural factors (Alebaji et al., 2022; Nour Alhuda Alaghawani, 2025).

Emergency services stress research now uses integrated, climate-informed occupational health frameworks. Recent scoping reviews and climate-health evaluations highlight psychological wellbeing in emergency climate adaption strategies (Bassey et al., 2025). A study on extreme temperatures and ED visits suggests climate-specific emergency workforce strategies (PoshtMashhadi et al., 2025). UAE study reveals that extreme heat harms communities and responders' physical, mental, and social wellbeing (Al Hurini et al., 2024). Stress research increasingly emphasizes resilience-building, environmental adaptation, and organizational restructuring to preserve ESP mental health from environmental risks (Bassey et al., 2025; Mustapha Amoadu, 2023).

Principles and Mechanisms of Psychological Stress

Neurobiological Stress Response Pathways

Emergency care personnel experience psychological stress from the body's neurobiological stress systems, which prepare them for urgent life risks. The hypothalamic-pituitary-adrenal (HPA) axis releases cortisol and adrenaline during stress, significant decisions, and unexpected situations (Ghahramanipirsalami et al., 2025). ESPs can act quickly in life-or-death circumstances because cortisol increases consciousness, glucose mobilization, and cardiovascular activity. Chronic activation of these pathways by emergency medical personnel can impact emotional regulation, memory, sleep cycles, anxiety, and depression (Sattam Zaid Alanazi et al., 2024). High heat in the Middle East causes thermal discomfort and cardiovascular stress, which activates the HPA-axis (Al Hurini et al., 2024). Trauma and ambient heat cause a chronic stress loop that keeps neurobiological systems running at high levels without recovery (Ghahramanipirsalami et al., 2025; Sattam Zaid Alanazi, 2024).

Heat strains neural stress systems. At extreme temperatures, vasodilation and perspiration increase cardiovascular and sympathetic nervous system activity (Al Hurini et al., 2024). This increases stress-related physiological processes and affects the body's regulating mechanisms. Chronic heat exposure elevates heart rate, dehydrates, and strains adrenal glands, which control thermal and psychological stress (Cornish, 2024). This simultaneous activation enhances emotional reactivity, irritability, and anxiety, especially during extended emergency shifts or high-acuity situations. ESPs may experience mental tiredness and cognitive overload due to occupational stress and thermal strain activating their neurobiological systems (Al Hurini et al., 2024; Cornish, 2024).

Heat and Psychological Function

Heat physiology also causes psychological stress in emergency workers, especially in hot Middle Eastern nations. Evaporation from sweat, vasodilation, and heart rate maintains body temperature. Heat, often exceeding 45°C in Gulf countries, overpowers these systems, producing dehydration, electrolyte imbalance, and plasma volume loss (Alebaji et al., 2022). Disruptions to synaptic transmission and neurotransmitter efficiency impair emotional regulation and cognitive clarity (Cornish, 2024). Thermal strain increases physical and cognitive weariness, causing emergency personnel to suffer more when lifting patients or fighting fires. Dehydration disrupts emotional regulation, increasing stress vulnerability and lowering frustration tolerance during emergency tasks (Alebaji et al., 2022; Cornish, 2024).

Humidity limits perspiration evaporation, making it difficult for the body to cool down after physical exertion, increasing physiological and psychological stress. ESPs must work in rapidly rising core body temperature in many Middle Eastern cities, especially coastal Gulf cities, during summer humidity (Al Hurini et al., 2024). Failure of thermoregulation impairs attention, memory, and problem-solving. This deterioration impairs emergency care judgments, increases mistakes, and increases psychological stress when responders function with cognitive impairment (Sun et al., 2021). Long hours without breaks can produce emotional fatigue from heat-related dizziness, headaches, tiredness, and parched mouth. Heat

physiology ties environmental stress to psychological functioning, making Middle Eastern emergency reaction harder (Al Hurini et al., 2024; Sun, 2021).

Heat Impairs Cognition and Executive Function

Thermal stress impacts cognitive and executive functioning, giving emergency responders psychological discomfort. Emergency treatment requires attentional capacity, working memory, and response speed, which extreme heat impairs (Sun et al., 2021). The prefrontal brain, which regulates decision-making, planning, and emotion, becomes less efficient under temperature strain, increasing the likelihood of errors, poor judgment, and slower emergency reaction times (McKoy, 2022). ESPs know their mistakes might hurt patients, therefore cognitive degeneration causes mental suffering. Internal strain to stay intellectually sharp despite environmental stress increases stress sensitivity and emotional tiredness (Cornish, 2024). One of the biggest professional difficulties for Middle Eastern responders is heat-related cognitive impairment, associated with chaotic emergency settings, noise, time pressure, and trauma exposure (Sun 2021; McKoy 2022)

Responders find it harder to regulate annoyance, anxiety, and impatience during heat-intensive tasks due to thermal impacts on cognitive and emotional processing. Heat raises physiological arousal and sympathetic activation, which enhances stress sensitivity and emotional response. This interaction is especially deleterious in multi-casualty catastrophes or high-pressure medical situations where ESPs must be cool and analytical despite cognitive fatigue (Maidina Jingesi et al., 2024). Even brief exposure to high heat degrades performance accuracy and increases mental weariness, suggesting that prolonged exposure, common in Middle Eastern summers, causes cumulative cognitive stress across shifts. Cognitive-emotional strain can lead to burnout, depersonalization, and clinical decision-making uncertainty (Maidina Jingesi et al., 2024; Cornish, 2024).

Environment and Occupational Stress Models

Job Demand-Control (JDC) model and Effort-Reward Imbalance (ERI) occupational stress theories describe psychological stress in emergency response personnel. JDC indicates that high job expectations and poor control produce chronic stress, comparable to emergency workplaces with unexpected crises, heavy workloads, and limited autonomy during high-pressure decisions (Chemali et al., 2019). The ERI model indicates how emotional, financial, and organisational imbalances between effort and rewards stress workers (ALmutairi & El.Mahalli, 2020). Extreme heat causes fatigue and cognitive strain, yet Middle Eastern organizations seldom provide ESPs with mental health treatment or recovery. The dual imbalance raises psychological burden, emotional fatigue, irritability, and long-term burnout (Chemali et al., 2019; ALmutairi & El.Mahalli, 2020).

These occupational stress models use ambient heat as an external stressor. High temperatures increase physical demands, environmental management, and cognitive issues that expand effort-reward discrepancies. Responders climb stairs, carry heavy equipment, and treat injured patients while dealing with heat stress, trauma, and emotional labor (Bassey et al., 2025). Heat inhibits workers' ability to adjust since emergency labor rarely provides rest periods, drink, or shade. Heatstroke, dehydration, and cardiovascular pain increase emergency calls and ESP workload and pressure, increasing operational unpredictability (Nour Alhuda Alaghawani et al., 2025). The feedback loop amplifies environmental, cognitive, and emotional pressures, generating a full stress mechanism for Middle Eastern emergency responders (Bassey et al., 2025; Nour Alhuda Alaghawani, 2025).

Psychological Stressors for Emergency Service Providers

Operations and Workload Stress

Emergency service providers (ESPs) face immediate and long-term psychological and operational stress. ESPs must multitask, decide quickly, and be vigilant. ESPs have little time to prepare for or dwell on unexpected occurrences including road accidents, cardiac arrests, fires, heatstroke, job losses, and community crises. Responders face cognitive and emotional stress as they must quickly identify threats, stabilize patients, and manage chaotic emergency scenes (Lawn et al., 2020). Mental fatigue and baseline stress from long hours and high-stakes operations reduce psychological recovery time between calls (Gill & Lauren, 2025). In summer, heat-related occurrences increase emergency personnel' caseloads, dispatches, and working tempos, straining their physical and mental health (Korakot Apiratwarakul et al., 2024). Operational intensity limits relaxation, hydration, and mental decompression, generating shift-long stress and emotional fatigue (Lawn et al., 2020; Korakot Apiratwarakul, 2024).

Night shifts, rotating duty cycles, and lengthy work hours disrupt circadian rhythms and sleep quality, generating workload stress. Sleep deprivation affects cognitive resilience, irritability, and psychological stress, making responders more susceptible to burnout and performance degradation (Chemali et al., 2019). In many Middle Eastern emergency services, high call volumes, insufficient staff, and summer incidents require lengthy hours with little rest. Emergency professionals must lift heavy patients, deliver CPR, and negotiate rough terrain, which causes mental fatigue and makes daily chores harder during busy seasons. Knowing that mistakes might be fatal increases anxiety even during regular exchanges, creating a cycle of operational strain (ALmutairi & El.Mahalli, 2020). In Qatar, UAE, and Saudi Arabia, emergency services are understaffed and underfunded, causing responders to handle more cases (Nour Alhuda Alaghawani et al., 2025). ESPs suffer psychological distress from operational pressure (Chemali et al., 2019; ALmutairi & El.Mahalli, 2020).

Climate and Environmental Stressors

In the Middle East, extreme temperatures, humidity, dust storms, and radiant heat affect rescue workers. Heatwaves that exceed 45°C and 50°C exhaust responders, dehydrate them, and impair their cognition. Thermal strain increases heart rate and reduces cognitive function, causing emotional distress and emergency operations errors (Al Hurini et al., 2024). High humidity accelerates overheating during physically demanding jobs like firefighting or carrying patients due to impaired sweat evaporation (Alebaji et al., 2022). These conditions make rescuers more angry, frustrated, and emotionally drained, especially during complicated emergencies that require physical endurance and cognitive clarity (Cornish, 2024). ESPs experience acute and chronic psychological stress from heat and humidity (Al Hurini et al., 2024; Alebaji, 2022).

Heat, humidity, and fire scene and emergency vehicle metal surface radiation exacerbate environmental stress. Middle Eastern firemen risk their lives in extreme heat from external heat sources and excessive exercise (Canetti et al., 2022). Sandstorms impair eyesight, breathing, and emergency vehicle navigation in Saudi Arabia, Qatar, and Kuwait. Sand exposure causes lung irritation, tiredness, and risky working circumstances that increase psychological stress due to accident risk or delayed response times (Bassey et al., 2025). Even with air conditioning, ambulances and emergency trucks can get too hot, causing rescuers to dehydrate before arriving at the scene (Nour Alhuda Alaghawani et al., 2025). This multi-layered climatic load raises emergency work psychological stress under extreme conditions (Canetti et al., 2022; Nour Alhuda Alaghawani, 2025).

Stressors in Structure and Organization

Organizational pressures cause ESP psychological strain when institutions lack support, resources, and infrastructure to manage environmental and operational issues. Middle Eastern emergency services have organisational challenges such outdated ambulance air-conditioning, lack of cooling vests, hydration stations, and shade structures (Bassey et al., 2025). Heat exposure increases rescuers' fatigue, emotional distress, and cognitive deterioration without cooling. Understaffing increases job intensity and call recovery time, adding to psychological stress. Responders on understaffed teams must handle more cases, do more physically demanding tasks, and answer more calls, which might exhaust and weaken them (ALmutairi & El.Mahalli, 2020). Systems gaps diminish morale and cause burnout by making individuals feel unsupported, undervalued, and overworked (Chemali et al., 2019;ALmutairi & El.Mahalli, 2020).

Organizational leadership, communication, and mental health culture impact stress. Hierarchical Middle Eastern emergency systems may hinder open communication, decision-making autonomy, and collaborative problem-solving, producing stress and inadequate control (Albazoon et al., 2023). Stigma and lack of availability deter responders from getting mental health help. Responders in Iran, Qatar, and Saudi Arabia adopt personal coping techniques because to a lack of institutional mental health facilities, which can cause emotional weariness and stress (Afshin Khazaei et al., 2024). When coupled with poor heat adaption or resilience training, these structural flaws fuel summer stress cycles. Organizational failures increase environmental and operational stress, making psychological strain on emergency personnel harder to manage (Albazoon et al., 2023; Afshin Khazaei, 2024).

Social, Trauma, and Psychological Stress

Emergency professionals experience pain, suffering, injury, and death, making emotional and trauma-related stress a severe psychological load. Responders are emotionally exhausted by graphic injuries, fatalities, and emotionally sensitive situations like mourning families or upset victims (Sattam Zaid Alanazi et al., 2024). Chronic trauma can cause compassion fatigue, intrusive memories, emotional

detachment, and PTSD. Lifesaving interventions in extreme heat enhance emotional sensitivity and cognitive fragility (Ghahramanipirsalami et al., 2025). Heat raises physiological arousal, making trauma more overwhelming and emotionally harder to process. Trauma and heat increase stress and reduce frontline emergency worker coping (Sattam Zaid Alanazi et al., 2024; Ghahramanipirsalami, 2025).

Middle Eastern ESPs struggle psychologically because to cultural and social pressures. Emergency workers in Saudi Arabia, UAE, Qatar, and Iran must be cool, strong, and unshakeable (Chemali et al., 2019). This assumption discourages vulnerability and maintains mental health support stigmas, making it hard for fatigued responders to get assistance. During peak summer months, public expectations for fast response times, flawless functioning, and continuous availability put emergency services under pressure (Alghamdi, 2022). Foreign emergency workers, who make up a substantial component of the Gulf emergency workforce, often face stress due to family separation, job insecurity, and cultural differences that limit their social support (Albazoon et al., 2023). Stress from sociocultural dynamics, emotional trauma, and environmental heat harms mental health (Alghamdi, 2022; Albazoon et al., 2023).

Impact of Summer Heat on Psychological Health

Stress, anxiety, and irritability plague emergency service providers (ESPs) in extreme summer temperatures. Responders in Gulf nations operate in temperatures exceeding 45°C, which increases cardiovascular strain, dehydration, and sympathetic nervous system activation, which enhances emotional sensitivity and stress reactivity (Al Hurini et al., 2024). Heat increases agitation, irritability, and restlessness, making emergency responders more irritable. Summer workloads and time-sensitive events like heatstroke, cardiac crises, and high-risk accidents boost emotional reactivity (Korakot Apiratwarakul et al., 2024). As acute stress increases, responders struggle to maintain emotional stability, creating psychological discomfort and reduced tolerance for difficult situations (Al Hurini et al., 2024; Korakot Apiratwarakul, 2024).

Heat quickly reduces attention, working memory, response speed, and executive control. Heat reduces prefrontal brain function, affecting decision-making, planning, and situational awareness, which are crucial for emergency response (Sun et al., 2021). Cognitive tiredness accelerates with brain temperature, causing concentration lapses, problems processing new information, and slower response times during critical processes. Responders strive to stay alert and precise in intellectually tough situations. Cognitive precision is essential in multi-casualty, motor vehicle, and high-acuity medical cases (McKoy, 2022). Participants sometimes feel overwhelmed, preoccupied, or unable to concentrate due to intense heat exposure, which raises performance anxiety and self-doubt. Summer heat causes acute emotional stress and impaired cognition in ESPs (Sun et al., 2021; McKoy, 2022).

Trauma, Burnout, And Emotional Weariness

High temperatures are connected to burnout, which causes emotional exhaustion, depersonalization, and worse performance. Summertime emergency responders commonly tire, deplete, and lose motivation due to heat discomfort and psychological stress (Chemali et al., 2019). Heat's impacts on physical stamina, cognitive vigor, and emotional irritability make rest periods difficult for respondents. Summer heat contributes to Middle Eastern EMS burnout (Albazoon et al., 2023). After responding to repeated emergency calls in difficult temperature circumstances, firefighters, paramedics, and rapid response teams sometimes feel overwhelming fatigue and emotional detachment, especially when workloads mount and staffing is limited (ALmutairi & El.Mahalli, 2020). Chronic fatigue lowers coping ability and increases stress sensitivity (Chemali et al., 2019; ALmutairi & El.Mahalli, 2020).

Extreme heat increases trauma-related symptoms such anxiety, depression, PTSD, and sleep problems. Responders face horrific injuries, deaths, and traumatizing conditions (Sattam Zaid Alanazi et al., 2024). Heat causes anxiousness, impatience, and mental fatigue, making it hard for rescuers to process unpleasant images and feelings. Hot weather increases ESP PTSD in Iran and Saudi Arabia with high operating demand (Ghahramanipirsalami et al., 2025). High temperatures impede restful sleep for emotional recovery by increasing nighttime discomfort and physiological hyperarousal (McKoy, 2022). Irritation, emotional instability, and trauma reminders from poor sleep harm mental health. Middle Eastern emergency professionals are emotionally exhausted from heat stress, trauma, and sleep disturbance (Sattam Zaid Alanazi et al., 2024; Ghahramanipirsalami, 2025).

Mental Health Physiological Changes Due to Heat

Heat exposure has serious physiological and mental health effects. At extreme temperatures, responders sweat, vasodilate, and increase heart rate to maintain homeostasis. Sustained stimulation strains the

cardiovascular and endocrine systems, increasing cortisol and adrenaline (Al Hurini et al., 2024). Adrenaline increases physiological alertness and anxiety, whereas cortisol causes irritability, emotional instability, and cognitive loss. Heat exposure causes dehydration, which lowers cerebral blood flow and electrolyte balance, producing disorientation, dizziness, and emotional dysregulation (Alebaji et al., 2022). Rescuers get stressed, exhausted, and mentally exhausted during long emergency operations due to physiological changes (Al Hurini et al., 2024; Alebaji, 2022).

Heat delays response, lowers awareness, and heightens emotions. Sun et al. (2021) revealed that heat strain decreases judgment, impulse control, and decision-making prefrontal regions. Responders may get tense or irritable while trying to focus or process information, creating psychological discomfort. In energy-intensive professions like lifting patients, wearing heavy protective gear, or doing CPR, heat can cause physiological fatigue (Canetti et al., 2022). Physical stress diminishes mental resilience, making responders more prone to emotional breakdowns, irritability, and panic. These physiological pathways suggest that heat induces systemic stress that impacts mental health (Sun et al., 2021; Canetti, 2022).

Decision Accuracy, Safety, and Workforce Effects

Extreme heat hinders decision-making and safety, making it one of the worst psychological consequences on emergency responders. High temperatures slow cognitive processing, attention, and situational awareness, making emergency operations harder to assess (Maidina Jingesi et al., 2024). Mental fatigue and poor clarity may prompt responders to misinterpret patient symptoms, neglect hazards, or delay essential decisions. These shortcomings increase the risk of medical mistakes, operational errors, and accidents, especially in high-pressure situations as traffic accidents, fires, and cardiac crises (Sun et al., 2021). When responders discover their heat strain performance is low, secondary anxiety and self-doubt may affect decision-making. Heat exposure lowers feedback loop safety performance and psychological confidence (Maidina Jingesi et al., 2024; Sun, 2021).

Middle Eastern ESPs' absenteeism, morale, and turnover intentions rise with heat. High temperatures make respondents more likely to request sick leave or time off to recover physically and mentally (Bassey et al., 2025). Environmental stress, unsupportive policies, and emergency undervaluation reduce morale. Chronic heat-induced stress promotes early resignation, especially among foreign workers with family concerns or job insecurity (Albazoon et al., 2023). As populations and climatic events rise, these consequences affect emergency system personnel stability and efficiency. Summer heat impairs mental health and Middle Eastern emergency response systems' resilience, performance, and sustainability (Bassey et al., 2025; Albazoon, 2023).

Comparison With Non-Summer & Non-Middle East Settings

Psychological Stress by Season

Emergency service providers (ESPs) experience higher psychological stress in summer than winter. Cognitive focus, physiological strain, and welfare improve in non-summer months when respondents work more steadily. Summer heat, especially in the Middle East, causes operational difficulties, dehydration, and cognitive weariness, which causes psychological distress (Al Hurini et al., 2024). Multiple global studies show that heatwaves increase heatstroke, dehydration, and cardiovascular emergency calls, increasing ESP effort and mental stress (Korakot Apiratwarakul et al., 2024). Winter and warm seasons lessen workloads and improve mental and physical health. This seasonal contrast shows how temperature fluctuations create cyclical stress patterns, with summer peaks in both Middle Eastern and non-Middle Eastern regions, but the intensity is greater in countries where temperatures exceed human thermal tolerance (Sun et al., 2021; Korakot Apiratwarakul, 2024)

Respiratory illnesses, influenza epidemics, and snow or poor visibility cause winter stress in Europe, North America, and East Asia (Li et al., 2014). Although high heat impairs cognitive ability and emotional control more than cold exposure, these issues considerably effect workload. Operational winter pressures include heavy call traffic and unsafe driving. Due to operational and biological challenges, Middle Eastern summers impact cognition, emotional resilience, sleep, and mental health. Summer stress in Middle Eastern ESPs is more severe, prolonged, and complex than in other seasons (Al Hurini et al., 2024; Li et al., 2014).

East Contrasted with West Climates

Climate impacts mental health, as shown by Middle Eastern and Western ESP stress. Some of the world's greatest summer temperatures are in the Middle East, especially the Gulf (Cornish, 2024).

Western countries including the US, UK, Australia, and Europe enjoy mild climates despite seasonal heatwaves. These heatwaves are less frequent, strong, and lengthy than Middle Eastern ones, reducing responder thermal strain (Sun et al., 2021). To prevent lethal heat, Western responders operate in climate-controlled ambulances, fire stations, and hospitals. Middle Eastern responders face heat stress and psychological strain due to excessive humidity, radiating heat, and poor ventilation (Alebaji et al., 2022). Responders in different locations have different stress levels due to climate (Cornish, 2024; Alebaji et al., 2022).

Western responders to rare heatwaves have episodic stress and workload increases, according to heat-health research. Middle Eastern heat-related stress lasts months, accumulating psychological load (Bassey et al., 2025). This constant environmental burden affects cognitive performance, emotional regulation, hydration, sleep quality, and cardiovascular function, increasing psychological stress. Due to lack of resources, high call volumes, or cultural expectations, some Middle Eastern responders work in dangerous temperatures during heatwaves. Western nations have stricter occupational safety standards. Constant exposure, urban heat island effects, and insufficient cooling infrastructure make Middle Eastern emergency responders more vulnerable than Westerners (Bassey et al., 2025; Sun, 2021).

National/Expatriate Workforce

GCC countries like Qatar, Saudi Arabia, and the UAE employ expatriate emergency responders extensively. Expatriate emergency medical professionals face cultural and psychological challenges. Expatriate responders may experience worry, emotional exhaustion, and low morale due to cultural adaptation, linguistic barriers, social isolation, and family separation (Albazoon et al., 2023 Western emergency responders operate in their own nation, follow their culture, and have more social support. Expatriate ESPs also worry about visas, job, and contract termination, which may exacerbate psychological stress during summer heatwaves (Chemali et al., 2019). Western employment systems are stable and culturally homogenous, whereas Middle Eastern emergency labor dynamics are unstable (Albazoon et al., 2023; Chemali, 2019).

Middle Eastern national responders are also expected to perform perfectly, maintain calm, and act professionally under pressure. Cultural norms promote hiding feelings, avoiding mental health care, and being robust despite suffering (Alghamdi, 2022). Western emergency workers operate in societies with better treatment, peer support, and psychological support. ESPs in the Middle East, both expatriates and nationals, experience more internalized stress, less coping strategies, and fewer mental health support alternatives than Western emergency workers (Afshin Khazaei et al. 2024). These workforce composition differences create fundamentally distinct psychological stress profiles for Middle Eastern and Western emergency workers (Alghamdi, 2022; Afshin Khazaei et al., 2024).

Rural/Urban Infrastructure and Technology Differences

Middle Eastern responders have more rural and urban emergency stress due to climate, geography, and infrastructure. Rural Middle Eastern responders, especially desert dwellers, face harsh weather, long travel distances, scant shade, and inadequate cooling and medical services (Bassey et al., 2025). These factors increase heat exposure, mobilization times, and psychological stress from rough terrain in hot weather. Urban responders face dense urban heat islands, higher call volumes, and increasingly complex crises including traffic accidents and high-rise building collapses even in developed places (Nour Alhuda Alaghawani et al., 2025). In contrast, Western rural-urban patterns have less infrastructure inequality and environmental heat (Li et al., 2014). Urban responders suffer hard workloads and heavy traffic during emergencies, which strains their minds, whereas rural Middle Eastern responders spend longer in the heat (Bassey et al., 2025; Nour Alhuda Alaghawani, 2025).

Regional technology and infrastructure greatly affect ESPs' mental health. Western countries have modern emergency vehicle cooling systems, climate-controlled stations, and technology-assisted navigation and dispatch platforms. Innovations reduce operating stress and environmental exposure. Middle Eastern systems fail to maintain ambulance cooling, apply heat-adapted clothes, and offer reliable infrastructure across all sites despite modernization (Alebaji et al., 2022). Qatari emergency vehicles have dangerously high interior temperatures even with air conditioning, highlighting infrastructural issues (Nour Alhuda Alaghawani et al., 2025). Remote responders must employ physical endurance and ingenuity without modern dispatch, telemedicine, or cooling systems. Middle Eastern ESP stress is much higher than in Western settings with warmer weather and more resources due to infrastructure inadequacies (Alebaji et al., 2022; Nour Alhuda Alaghawani, 2025).

Research Findings and Evidence Base

Heat-Related Psychological Strain Evidence

Research in the Middle East demonstrates that extreme summer heat greatly affects emergency response professionals' psychological stress. Qatar, UAE, Iran, and Saudi Arabia observed increased emotional strain, annoyance, and anxiety during peak hot months when temperatures exceed thermoregulatory thresholds (Al Hurini et al., 2024). Heat accelerates sympathetic nervous system reactions and physiological and emotional responses during emergency operations. Higher call numbers, trauma exposure, and environmental discomfort cause psychological distress in Iranian and Saudi prehospital professionals in summer (Ghahramanipirsalami et al., 2025; Sattam Zaid Alanazi, 2024). The research shows that ambient heat affects ESPs' psychological health in heat-prone places (Al Hurini et al., 2024; Ghahramanipirsalami, 2025).

Research shows that heat considerably increases cognitive tiredness and emotional instability. Extreme temperatures exhaust Middle Eastern ESPs faster, lower their frustration tolerance, and heighten their emotional reactivity during emergencies. Worldwide, heat raises heart rate, dehydration, and perceived exertion during rescue attempts, producing mental stress (Korakot Apiratwarakul et al., 2024). Studies show that heat causes severe psychological stress among regional emergency personnel (Al Hurini et al., 2024; Korakot Apiratwarakul, 2024).

Clinical and Field Studies Show Cognitive and Performance Effects

Heat exposure reduces ESP cognitive abilities, according to extensive study. Controlled investigations show that thermal strain impairs attention, memory, reaction speed, and emergency response decision-making accuracy (Canetti et al., 2022). In emergency operations, short-term heat exposure affects prefrontal brain function, reducing information processing and impulse control (Sun et al., 2021). Performance declines increase error risk and psychological distress. Heatwaves increase heat-related emergency visits for disorientation, dizziness, and mental health symptoms in China and Australia, thereby increasing responder cognitive effort and emotional fatigue (Li et al., 2014; Toloo, 2014). Heat exposure causes mental fatigue, concentration issues, and decreased situational awareness, which increase stress (Canetti et al., 2022; Sun et al., 2021). Heat makes tough emergencies more emotive. ESPs express more unhappiness, self-doubt, and problems staying calm during cognitively demanding heat stress. Heat-induced cognitive decline is a major psychological stressor for Middle Eastern emergency personnel (Sun et al., 2021; McKoy, 2022).

Long-Term Mental Health, Trauma, Burnout

Middle Eastern ESPs had substantially higher rates of emotional tiredness, depersonalization, and occupational unhappiness than temperate cultures. Qatar and UAE thorough reviews found that environmental heat promotes emergency worker burnout (Albazoon et al., 2023). Summer workloads and hydration concerns create fatigue, emotional stress, and coping difficulties. Saudi Arabia and Iran report that heatwaves increase burnout owing to physiological strain and cognitive incapacity (ALmutairi & El.Mahalli, 2020). Hot weather worsens PTSD, depression, sleep difficulty, and death anxiety. Saudi research shows that ESPs' PTSD rates grow during operationally challenging times with harsh temperatures (Sattam Zaid Alanazi et al., 2024). Iranian research links prehospital responders' heat stress, chronic tiredness, and death fear (Ghahramanipirsalami et al., 2025).

Heatwaves cause mental health issues including suicide, anxiety, and depression worldwide, straining responders emotionally (McKoy, 2022; Runkle et al., 2025). Heat amplifies trauma exposure, raising ESPs' long-term mental risks (Sattam Zaid Alanazi et al., 2024; Runkle, 2025). Long-term psychological stress disrupts sleep. Heat boosts nocturnal body temperature and enhances sympathetic activity, reducing trauma-recovery sleep for ESPs. Irritation, mental stress, and intrusive trauma from poor sleep impair shift resilience (McKoy, 2022).

Regional Environmental, Organizational, Comparative Evidence

Heat increases emergency workloads, according to environmental studies. Qatar and Shenzhen study shows that rising temperatures increase ambulance dispatches, especially for cardiovascular and heat-related issues (Maidina Jingesi et al., 2024; Nour Alhuda Alaghawani, 2025). These increases raise psychological strain by forcing responders to work faster, with fewer breaks and more stressful occurrences. Heat causes unexpected dispatch patterns, requiring speedy adaptation and mental strain (Yeargin et al., 2020). Humidity surges and sandstorms make labor unsafe, visibility poor, and discomfort high (Bassey et al., 2025; Cornish, 2024).

Organisational factors impact psychological outcomes. Middle Eastern ESPs are overheated due to insufficient cooling, hydration, rest, and ambulance ventilation (Alebaji et al., 2022). Qatari researchers showed that automobile interiors can reach dangerous temperatures even with air conditioning, exacerbating dehydration and heat strain during shift work (Nour Alhuda Alaghawani et al., 2025). Staff shortages and mental health difficulties increase workload and emotional stress in summer (ALmutairi & El.Mahalli, 2020). Organizationally unsupported respondents generally feel emotionally exhausted and stressed, according to qualitative investigations (Afshin Khazaei et al., 2024). Research shows that environmental and organisational stress impact psychological health jointly (Alebaji et al., 2022; Afshin Khazaei, 2024).

Western and Middle Eastern emergency systems differ substantially. Middle Eastern summers are much hotter than seasonal winter rises or episodic heatwaves for Western responses (Sun et al., 2021). GCC expatriate ESPs are more susceptible to mental health disorders due to cultural displacement, language barriers, and social isolation (Albazoon et al., 2023). West responders work in their native culture with more mental health institutions. Western systems have superior cooling, climate-controlled buildings, and dispatch systems than many Middle Eastern locales (Bassey et al., 2025). Cross-regional comparisons show Middle Eastern emergency personnel' unique and difficult psychological challenges (Albazoon et al., 2023; Bassey, 2025).

Middle Eastern ESPers' Heat-Related Psychological Strain

High summer heat is the leading cause of psychological anguish, say Middle Eastern emergency care researchers. Summer heat increases irritation, anxiety, emotional volatility, and stress tolerance in Qatar, UAE, Saudi Arabia, and Iran (Al Hurini et al., 2024). Heat exposure increases sympathetic activation and perceived exertion, which enhances emergency emotional response and psychological instability. Prehospital care personnel, ambulance staff, firefighters, and rapid-response units experience emotional stress from extreme temperatures. Climate worsens occupational stress pathways, as Iranian and Saudi Arabian studies reveal that high call volume and environmental discomfort promote psychological distress (Al Hurini et al., 2024).

Research shows that extreme heat accelerates emotional regulation, increasing frustration, poor patience, and irritation during emergency calls. Heatstroke, dehydration, asthma attacks, and cardiovascular events increase with operational stress in summer, exacerbating these emotional reactions (Korakot Apiratwarakul et al., 2024). Heat increases work difficulty and fatigue, making responders more emotionally exhausted. Regional study strongly suggests that heat is a separate psychological stressor that alters ESPs' emotional functioning (Korakot Apiratwarakul et al., 2024; Al Hurini, 2024).

Heat Stress Cognitive, Performance, and Decision-Making Evidence

Numerous studies show that extreme heat affects emergency responders' cognition, decision-making, and performance. Heat exposure reduces working memory, attention span, psychomotor coordination, and response time, essential for emergency medical judgment, in controlled tests (Canetti et al., 2022). Thermal strain slows brain thinking and prefrontal cortex function, making vital signs, drug calculations, triage decisions, and scene assessments difficult for rescuers (Sun et al., 2021). In simulated fireground investigations, responders under extreme heat showed worse situational awareness, slower task-switching, and more procedural errors (Canetti et al., 2022). Heat exposure appears to directly impair cognitive integrity, mental health, performance confidence, and safety (Sun et al., 2021; Canetti, 2022).

Another study found that heat-induced cognitive depletion increases emergency stress. Trying to focus under heat stress causes concern, irritation, and fear of errors, which raises psychological distress (McKoy, 2022). Heatwaves increase confusion-related patient visits, behavioral agitation, and mental health crises in emergency systems, straining responders' cognitive and emotional resources, according to Chinese and Australian research. Complex situations require cognitive acuity, but heat hinders responses. Climate and cognitive stress are linked, as regional Middle Eastern research shows that ESPs typically experience mental fog, declining attention, and difficulty noticing dynamic emergency situations during extreme heat (Sun et al., 2021; McKoy, 2022).

Heat impacts neurocognitive function, decision-making, and executive control beyond emotional suffering, according to the study. Cognitive strain over shifts causes secondary psychological stress, self-doubt, and decreased resilience in responders during prolonged emergency operations (Canetti et al., 2022; Sun et al., 2021).

Burnout, Trauma, Sleep Troubles, Long-Term Mental Health Evidence

ESPs working in severe temperatures typically burnout, study shows. Qatari and UAE systematic assessments and national-level study demonstrate alarming levels of emotional tiredness, depersonalization, and professional competence among emergency medical staff (Albazoon et al., 2023). Warmer temperatures and heat-related exertion promote summer burnout (ALmutairi & El.Mahalli, 2020). Heat causes seasonal burnout peaks by exhausting the body, draining the mind, and lowering cognitive resilience. Due to months-long Middle Eastern heat, burnout occurs fast with limited recovery time (Albazoon et al., 2023; ALmutairi & El.Mahalli, 2020).

Environmental heat worsens depression, anxiety, and PTSD. PTSD was more common in Saudi emergency medical professionals in high-stress, high-heat conditions (Sattam Zaid Alanazi et al., 2024). Heat stress, chronic fatigue, and death dread also harm mental health in Iranian multicenter studies (Ghahramanipirsalami et al., 2025). Heatwaves increase mental illness emergency visits, including suicidal thoughts, acute agitation, and depression, which add emotional labor to emergency workload and enhance responder trauma symptoms, according to global climate-health studies. (McCoy, 2022; Runkle et al., 2025). Ambient heat, trauma exposure, and ESP mental diseases may be linked over time (Sattam Zaid Alanazi et al., 2024; Runkle, 2025).

Research suggests sleep disruption is another important finding. Due to nighttime thermoregulation disruption, extreme heat causes fragmented sleep, insomnia, and delayed deep sleep cycles, which lowers emotional regulatory and increases irritability (McKoy, 2022). Heat-related sleep disruption enhances fatigue, anxiety, and cognitive function in irregular-shift emergency responders. In peak summer, Middle Eastern ESP populations experience burnout, depression, and trauma-related problems due to chronic sleep deprivation (McKoy, 2022; Ghahramanipirsalami et al., 2025).

Regional, Organizational, and Environmental Comparisons

An environmental research found that heat directly impacts emergency call volumes and responder effort. Qatar and Shenzhen research show that rising temperatures increase heatstroke, dehydration, and cardiovascular ambulance dispatches (Maidina Jingesi et al., 2024; Nour Alhuda Alaghawani, 2025). Call volume lowers rest intervals, exposes responders to awful occurrences, and requires lengthy hours in unsafe conditions, which causes psychological stress. Heatwaves increase seasonal workload, demonstrating the link between climatic events and emergency system pressure (Korakot Apiratwarakul et al., 2024; Yeargin, 2020). Sandstorms, humidity surges, and poor air quality diminish eyesight, respiratory comfort, and emergency navigation, increasing stress (Bassey et al., 2025; Cornish, 2024).

Organizational factors strongly impact heat's psychological consequences. Poor ambulance cooling, limited rest areas, insufficient cooling apparel, and outdated ventilation systems plague Middle Eastern emergency services (Alebaji et al., 2022). Qatari research shows that fast response vehicles' interior temperatures remain dangerously high despite air-conditioning, exposing responders to thermal stress before emergency conditions (Nour Alhuda Alaghawani et al., 2025). Shortages of staff, especially in summer when call levels peak, increase effort and reduce shift recovery time. Many respondents feel organizationally unsupported, under-recognized, and emotionally drained in high-heat seasons (Afshin Khazaei et al., 2024; ALmutairi & El.Mahalli, 2020). These findings show that environmental stress dynamically interacts with organizational shortcomings to raise ESP psychological strain (Alebaji et al., 2022; Afshin Khazaei, 2024).

Studies reveal that Middle Eastern emergency responders face higher psychological and environmental challenges than Westerners. Western responders have episodic heat stress from seasonal heatwaves, which are shorter, less intense, and better supported by cooling infrastructure and occupational safety legislation (Sun et al., 2021). Middle Eastern heat is severe, protracted, and connected to high humidity and urban heat island effects, causing long-term stress. Workforce composition matters: Cultural isolation, communication challenges, and limited social support plague Middle Eastern emergency services expats (Albazoon et al., 2023). Middle Eastern ESPs' psychological stress is more chronic and severe than Western ones due to infrastructural shortages including cooling systems, technology, and upgraded rescue vehicles (Bassey et al., 2025; Albazoon, 2023).

Coping Strategies and Resilience Factors

Personal Coping Systems

In summer heat, Middle Eastern emergency service providers (ESPs) adopt customized coping methods to stay calm. Hydration control is crucial for self-regulation since dehydration produces cognitive

fatigue, emotional distress, and physiological strain. Hydrated responders exhibited greater awareness, thermal comfort, and mental control during stressful operations (Alebaji et al., 2022). Rest pacing, brief breaks for cooling, rehydration, and muscular relaxation, improves resilience, especially during heatwaves when call volumes soar. Meditation, deep breathing, and grounding techniques diminish sympathetic arousal and stress reactivity in chaotic emergencies (Afshin Khazaei et al., 2024). Higher cardiovascular training helps responders withstand heat, maintain cognitive sharpness, and minimize stress-related weariness (Korakot Apiratwarakul et al., 2024; Alebaji, 2022).

Team and Peer Support

Mental stress from heat is reduced by teamwork. Colleagues' support amid high-pressure situations reduces workload and emotional stress (Lawn et al., 2020). Teamwork including exchanging responsibilities in hot weather, buddy checks for dehydration, and emotional load sharing increases group stability and reduces burnout. Peer support reduces isolation during upsetting calls and promotes open discourse and stress identification (ALmutairi & El.Mahalli, 2020). Team debriefings after extended summer operations allow emotional venting and collaborative problem-solving, minimizing long-term psychological distress and building heat tolerance (ALmutairi & El.Mahalli, 2020; Lawn et al.2020).

Religion-Culture Coping Paths

Middle Eastern ESPs use religion and culture to manage professional stress. Spirituality, prayer, and religious meaning assist trauma survivors accept (Alghamdi, 2022). Islamic beliefs regarding duty, loyalty, and divine reward reduce pessimism and increase psychological endurance after intense heat exposures. Cultural norms promoting communal identity, familial centrality, and honour foster secondary resilience through personal network help-seeking (Chemali et al., 2019). Cultural qualities such as patience and endurance help responders cope with stress during prolonged heatwaves (Alghamdi, 2022; Chemali et al., 2019).

Mental Health First Aid and Crisis Intervention

ESPs under high stress in extreme temperatures are using Psychological First Aid (PFA) as an urgent coping mechanism. Responders may manage acute stress during overwhelming emergencies with PFA's fast emotional stabilization, practical support, and reassurance (Sattam Zaid Alanazi et al., 2024). More summer traumas occur, but regulated post-incident debriefing, guided emotional processing, and short cognitive reframing help responders recover. PFA slows the transition from acute stress to PTSD and depression (Ghahramanipirsalami et al., 2025). During heatwaves, EMS units with trained psychological support workers boost responder resilience and reduce long-term mental distress (Sattam Zaid Alanazi et al., 2024; Ghahramanipirsalami, 2025).

Stress Simulation/Resilience

Effective resilience training can improve mental endurance heat stress. To help responders handle pressure, programs offer adaptive coping, stress inoculation, cognitive restructuring, and self-regulation (Afshin Khazaei et al., 2024). Rescuers learn adaptive physiological and psychological reactions before genuine crises by simulating heat, physical strain, and high-stakes scenario pressure (Canetti et al., 2022). Realistic simulations minimize fear, improve decision-making, and raise confidence when rescuers face equal heat stress during operations, according to research. Simulation-based stress exposure reduces emergency worker fatigue and enhances resilience (Canetti et al., 2022; Khazaei, 2024).

Leadership Builds Resilience

Leadership affects summer ESP stress. Supportive leaders increase psychological safety by prioritizing team wellness, hydration breaks, rest rotation, and calm decision-making (Albazoon et al., 2023). Leaders who communicate well, identify worker tiredness, and validate emotional distress reduce burnout and improve team resilience. In difficult weather, unsupportive leadership produces emotional exhaustion and burnout (Chemali et al., 2019). To strengthen frontline resilience, Middle Eastern EMS systems must engage in leadership development (Albazoon et al., 2023; Chemali, 2019).

Institutional, Technological, & Policy Interventions

Organizations mitigate heat-related psychological strain using structured heat adaption techniques. A mandatory rest-cooling cycle, water checkpoints, shaded recovery zones, and rotation schedule avoid prolonged heat exposure (Bassey et al., 2025). Such strategies reduce heat exhaustion, cognitive instability, and emotional reactivity during emergency operations in heat-prone areas. Pre-planned heatwave activation protocols, triggered by humidity index and radiant heat thresholds, help EMS teams

adjust deployment and resource management in severe conditions (Korakot Apiratwarakul et al., 2024; Bassey, 2025).

Many modern cooling systems reduce heat strain. Cooling vests, phase-change packs, vented helmets, and mist-based cooling devices maintain physiological stability during long outdoor activities (Alebaji et al., 2022). Updated AC systems, insulated interiors, and temperature-regulating panels reduce heat buildup in ambulances where responders spend long periods (Nour Alhuda Alaghawani et al., 2025). Crisis cooling strategies improve cognition, irritability, and emotional stability (Canetti et al., 2022; Alebaji, 2022).

Summer Shift Reorganization

Institutional seasonal shift reconfiguration increases in summer. Short shifts, evening-night scheduling, peak heat days with more staff, and rapid-cycle worker turnover reduce physical and mental fatigue (ALmutairi & El.Mahalli, 2020). Gulf EMS systems discovered that altering shift load during severe temperatures minimizes burnout and psychological strain, enhancing responder resilience and performance (Albazoon et al., 2023; ALmutairi & El.Mahalli, 2020).

Mental Health Support Systems

Organizational mental health infrastructure strongly predicts ESP mental health. Counseling, peer-support groups, confidential helplines, and on-site psychologists reduce trauma and help improve coping (Chemali et al., 2019). Mental health checks throughout shifts might detect tiredness and PTSD. Iranian and Saudi researchers emphasize institutionalized psychological treatment since respondents often use personal coping techniques due to stigma or lack of resources (Afshin Khazaei, 2024; Sattam Zaid Alanazi, 2024).

National Occupational Health Policies of GCC

Government policies dramatically affect severe heat ESP safety. Midday outdoor work limitations, heat-stress standards, and worker protections are in GCC nations, however emergency workers are exempt due to operational considerations (Cornish, 2024 Iran and Lebanon have heat-health surveillance and disaster planning standards, but resources impede implementation (Mustapha Amoadu et al., 2023). Areawide, emergency personnel heat safety needs improvement (Cornish, 2024; Mustapha Amoadu et al., 2023).

ILO (International Labour Organization), WHO (World Health Organization), and OSHA (Occupational Safety and Health Administration) Guidelines

International frameworks can assist Middle Eastern EMS adapt. WHO and ILO propose heat-stress management, physiological monitoring, hydration, and worker protection in high-risk industries (Bassey et al., 2025). Cooling breaks, worker education, acclimatization schedules, and environmental hazard evaluation are OSHA requirements. The frameworks lower perceived risk and boost responder safety confidence, boosting psychological outcomes (Mustapha Amoadu et al., 2023; Bassey, 2025).

AI Monitoring, Smart Sensors, Early Warning

In real time, temperature sensors, wearable hydration monitors, heart-rate variability trackers, and AI-based heat alert systems prevent heat-induced psychological strain. These devices warn respondents of temperature, dehydration, and weariness thresholds, preventing cognitive decline and emotional instability (Nour Alhuda Alaghawani et al., 2025). Smart dispatch systems combining climate data and AI projections might help EMS agencies avoid overload and stress during heatwaves (Korakot Apiratwarakul et al., 2024; Nour Alhuda Alaghawani, 2025).

Limitations and Potential Risks

Strong evidence links high heat exposure to psychological distress in Middle Eastern emergency service providers (ESPs), but research limits limit our understanding of this complex phenomenon. Psychological symptoms are underreported in emergency healthcare due to stigma, which associates emotional resilience with expertise and trustworthiness. Fear of being regarded as incapable or losing professional prospects discourages respondents from revealing stress, burnout, or trauma, leading in inflated prevalence rates and poor psychological profiles (Chemali et al., 2019). In Gulf and Levant nations, cultural expectations of emotional strength limit self-reporting, especially in male-dominated EMS groups where weakness is socially ostracized (Alghamdi, 2022). Untreated psychological distress can cause burnout, depression, or PTSD, jeopardizing patient safety and workforce stability (Chemali et al., 2019; Alghamdi, 2022).

Lack of region-specific, high-quality empirical data links heat exposure to psychological impacts hampers research. Many Qatar, UAE, and Iran studies reveal significant associations, however most employ cross-sectional data, convenience sampling, or limited geographic coverage (Al Hurini et al., 2024). This makes it hard to generalize research across Middle Eastern climes, where humidity, calamity frequency, and workforce composition impact stress. Using different heat indices such wet bulb globe temperature (WBGT), humidity index, or radiant heat load gives varied definitions of "extreme heat," limiting cross-study comparability (Bassey et al., 2025). Burnout, anxiety, and trauma diagnoses are challenging to standardize due to uneven and non-validated psychological metrics (ALmutairi & El.Mahalli, 2020). Female ESPs are underrepresented in most Middle Eastern EMS systems, therefore little is known about their stress pathways despite worldwide healthcare studies demonstrating gender disparities in emotional tiredness and burnout development (Albazoon et al., 2023). These methodological constraints raise the possibility of overlooking psychological injuries, especially those emerging gradually under heat stress, and lead to institutional complacency when mental health issues may be overlooked (Afshin Khazaei, 2024; Sattam Zaid Alanazi, 2024).

Future Directions

ESPs' acute and increasing psychological problems at high temps require specialized study and therapeutic techniques because of these limits. AI-driven heat stress detection systems that combine physiological data like heart rate, hydration level, and thermal load with environmental cues to predict cognitive decline or psychological dysregulation are promising (Nour Alhuda Alaghawani et al., 2025). By assessing responders' physiological and psychological stress, wearable sensors and real-time feedback loops may increase safety. Phase-change vests, heat-resistant garments, and ambulance ventilation systems may reduce thermal and psychological stress (Alebaji et al., 2022). Cortisol levels and heart-rate variability can be used in routine evaluations to objectively assess stress building and enable early treatments and more tailored mental health care (Sun et al., 2021; Canetti, 2022).

Cross-sectional methods fail to account for long-term adaptations, wear-and-tear, or delayed-onset stress, hence longitudinal cohort studies are needed to capture the cumulative psychological effects of heat over seasons. Standardizing mental health standards across Gulf, Levant, and Iranian institutions guarantees ESPs receive psychiatric screening, organized debriefings, and summer-specific operational norms. Mobile mental health units, like mobile ICUs, can help rescuers keep calm during heatwaves (Ghahramanipirsalami et al., 2025). Virtual reality training that replicates heat, fatigue, and complex trauma may reduce stress and teach rescuers coping skills before genuine situations (Canetti et al., 2022). We require gender- and expatriate-focused research because both groups make up a large percentage of the Middle Eastern EMS workforce (Albazoon et al., 2023). ESP psychological health models will be more comprehensive and future-focused with these areas (Albazoon et al., 2023; Ghahramanipirsalami, 2025).

Conclusion

This review reveals that excessive heat, high operational demands, trauma, and organizational restrictions increase Middle Eastern emergency care professionals' psychological burden. Summer causes acute stress, cognitive tiredness, emotional depletion, impatience, burnout, and trauma symptoms, making work risky. Unlike temperate regions where heatwaves occur episodically, Middle Eastern responders experience chronic physiological strain that impacts mental health. These trends indicate psychological readiness gaps during heat-intensive months and the need for summer-specific crisis planning, including heat-adaptive shift scheduling, trauma-informed leadership, improved cooling infrastructure, and mental health surveillance in routine operations. Resilience training, community support, and cultural coping frameworks lower psychological risk, while regional evidence-based policy-level measures standardize safeguards and reduce unnecessary damage. Technological innovation, institutional reform, occupational health policy, and culturally relevant mental health strategies are needed to help ESPs serve safely and effectively in one of the world's most challenging climates.

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