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# ETHICAL CHALLENGES IN PREHOSPITAL EMERGENCY CARE: A SYSTEMATIC REVIEW OF THE LITERATURE ON DECISION-MAKING IN AUSTERE ENVIRONMENTS

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**Abstract:**
*Prehospital care in austere environments presents a unique set of ethical challenges that extend beyond clinical decision-making. This systematic review synthesizes the literature to identify and characterize the ethical dilemmas faced by emergency medical providers in these high-stakes settings. The analysis reveals five predominant themes: (1) triage and resource allocation under scarcity, (2) consent and patient autonomy in crisis situations, (3) determining the limits of beneficence and non-maleficence, (4) professional role integrity and moral distress, and (5) balancing duty of care with provider safety. These challenges are influenced by system-level, provider-level, and situation-level factors and have significant consequences for both patient care quality and provider well-being, including moral distress, burnout, and PTSD. The findings underscore the erosion of standard bioethical frameworks in austerity and highlight the critical need for enhanced ethics education, robust support systems, and the development of practical decision-making aids. We propose the concept of "Prehospital Ethical Resilience" as a necessary focus for future efforts aimed at supporting providers and ensuring ethically sound care in these demanding environments.*

***Keywords:*** *Prehospital Ethics, Moral Distress, Austere Medicine, Resource Allocation, Emergency Medical Services*

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## 1. INTRODUCTION:

### 1.1. The Unique Nature of the Prehospital Environment

The prehospital environment, encompassing emergency medical services (EMS), air medical retrieval, and disaster response, represents a critical and distinct frontier in healthcare. It is characterized by inherent unpredictability and the absence of the controlled conditions found within hospital walls, demanding that providers operate with a high degree of autonomy and clinical acumen (Butler et al., 2024). This setting is further defined by its frequent austerity and the high-acuity nature of patient presentations, creating a unique and demanding clinical landscape.

#### 1.1.1. Defining "Austere" and High-Acuity Prehospital Settings

An "austere" prehospital setting is defined not merely by geographical remoteness but by a fundamental limitation of resources, including personnel, equipment, medications, and situational control (Lennquist, 2020; Prescott et al., 2022). This extends beyond rural settings to include complex urban incidents, mass-casualty events, and hostile environments where normal infrastructure is compromised, such as in humanitarian crises (Prescott et al., 2022; Pingree et al., 2020). High-acuity patients in these contexts present with immediately life-threatening conditions, such as severe trauma, cardiac arrest, or respiratory failure, where interventions must be initiated within the "golden hour" to maximize chances of survival (Clemency et al., 2017; Tolles et al., 2025). The recent push to advance care in these settings, including through digital technologies and novel research consortiums, highlights both the critical importance and the immense challenges of providing care outside the hospital (Li et al., 2025; Tolles et al., 2025; Niyonsaba et al., 2023).

#### 1.1.2. Key Constraints: Time Pressure, Limited Resources, and Diagnostic Uncertainty

Practitioners in this domain face a triad of formidable constraints. Time pressure is relentless, forcing rapid patient assessment and intervention, often without the luxury of lengthy deliberation (Nordén et al., 2021). Limited resources necessitate difficult prioritization decisions, such as rationing advanced interventions or determining the order of treatment and evacuation in a mass-casualty scenario (Klein et al., 2021; Martin & Eckert, 2016). This is exemplified in challenges such as the safe and ethical use of physical restraint, where equipment and personnel limitations directly impact decision-making (Mcdowall et al., 2023). Finally, diagnostic uncertainty is pervasive; providers must rely on brief histories and focused physical exams without the confirmatory power of laboratory tests or advanced imaging, leading to decision-making based on incomplete information (Mikkelsen & Lossius, 2020; Torabi et al., 2019).

### 1.2. The Centrality of Ethical Decision-Making

Within this complex operational context, clinical decision-making is inextricably linked with ethical reasoning. Standard operating procedures and clinical guidelines, while essential, often reach their limits when confronted with the extreme realities of austere care.

#### 1.2.1. The Shift from Clinical Guidelines to Ethical Reasoning in Austerity

In resource-rich environments, clinical pathways provide clear direction. However, in austerity, providers frequently encounter situations where strict adherence to guidelines is impossible or where multiple guidelines conflict (Fowler et al., 2019). This forces a shift from a purely algorithmic approach to one grounded in ethical deliberation, requiring providers to balance competing values and principles in real-time (Torabi et al., 2019). For instance, the decision to terminate resuscitation in the field, to allocate the last available ventilator, or to follow real-time EMS direction in a complex ethical scenario are not purely clinical judgments but profound ethical ones (Brenner et al., 2018; Pasquale, 2017).

#### 1.2.2. Core Ethical Principles in Medicine and Their Prehospital Tensions

The traditional biomedical ethical principles—autonomy, beneficence, non-maleficence, and

justice—assume unique and often conflicting dimensions in the prehospital setting (Beauchamp & Childress, 2019). Respecting patient autonomy is challenging when patients lack decision-making capacity, time is short, and informed consent is impractical (Torabi et al., 2020). The duty of beneficence (to do good) and non-maleficence (to avoid harm) can conflict during high-risk procedures or when considering the risks and benefits of interventions like physical restraint (Mcdowall et al., 2023). Most saliently in austere settings, the principle of justice—the fair distribution of resources—becomes paramount, moving from a theoretical concept to a daily operational challenge in the form of triage and resource allocation (Klein et al., 2021; Martin & Eckert, 2016).

### 1.3. Scope and Rationale

#### 1.3.1. Identifying the Known and Unknown Challenges

While the clinical challenges of prehospital care are well-documented, the specific ethical dimensions are less systematically understood. Existing literature has identified recurring themes, such as issues of consent, confidentiality, end-of-life decisions, and the specific barriers to ethical practice (Nordén et al., 2021; O'Connell & Dowling, 2022; Torabi et al., 2020). However, the full spectrum of these challenges, the contextual factors that precipitate them, and their nuanced impact remain fragmented across studies from disparate disciplines such as EMS, disaster medicine, and military medicine (Prescott et al., 2022; Pingree et al., 2020).

#### 1.3.2. The Impact on Provider Well-being and Patient Outcomes

The cumulative burden of making high-stakes ethical decisions under pressure has significant consequences. For providers, it is a key contributor to moral distress, burnout, and psychological trauma, which can impair long-term well-being and career sustainability (Maguire et al., 2021; Torabi et al., 2020). The experience of task failure can profoundly influence future decision-making, creating a cycle of stress and hesitation (Pasquale, 2017). For patients, the quality and ethical soundness of these in-the-moment decisions directly influence clinical outcomes, satisfaction with care, and trust in emergency healthcare systems (Fowler et al., 2019; Brenner et al., 2018).

### 1.4. Research Aim and Objectives

To address this gap, the present study will undertake a systematic synthesis of the existing literature. The study aims to systematically identify, synthesize, and characterize the ethical challenges described in the literature regarding decision-making in prehospital austere environments.

## 2. METHODS:

### 2.1. Study Design and Reporting Guidelines

This research was conducted as a systematic review of the literature. Systematic reviews are designed to identify, evaluate, and synthesize all relevant studies on a particular question or topic, using a systematic and explicit methodology to minimize bias and ensure reproducibility.

#### 2.1.1. Adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement

The review was conducted and is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). The PRISMA checklist was used to guide the reporting process, ensuring transparency and completeness. A PRISMA flow diagram will be presented in the results section to document the study selection process.

### 2.2. Eligibility Criteria (PICOS Framework)

The eligibility criteria were defined a priori using the PICOS (Population, Phenomenon of Interest, Context, Study Types) framework to ensure a focused and relevant search.

#### 2.2.1. Population

The population of interest included prehospital emergency care providers (e.g., emergency medical technicians [EMTs], paramedics, flight nurses, physicians operating in prehospital settings, and disaster response team members) and/or the patients under their care. Studies focusing on the ethical dimensions of the decisions made by or for these individuals were included.

#### 2.2.2. Phenomenon of Interest

The core phenomenon of interest was ethical challenges, dilemmas, conflicts, or uncertainties experienced or observed during clinical decision-making. This encompassed issues related to principles such as autonomy, beneficence, non-maleficence, justice, as well as professional integrity, confidentiality, and consent.

#### 2.2.3. Context

Studies were included if they were set in austere, resource-limited, or high-acuity prehospital environments. This included, but was not limited to, roadside emergencies, domestic residences, disaster zones (natural or man-made), remote/wilderness areas, and military conflict settings.

#### 2.2.4. Study Types

To capture the breadth of literature on this topic, we included:

- Primary qualitative studies (e.g., phenomenology, ethnography, grounded theory).

- Primary quantitative studies (e.g., cross-sectional surveys, cohort studies).
- Mixed-methods studies.
- Systematic reviews and meta-analyses.
- Significant theoretical papers or scholarly commentaries that provided original analysis or framework development.
-

#### 2.2.5. Exclusion Criteria

Studies were excluded if they:

- Focused exclusively on in-hospital ethical decision-making.
- Pertained to non-emergency or scheduled medical transport.
- Were not available in the English language (due to resource constraints for translation).
- Were conference abstracts without a subsequent full-text paper, editorials without substantial analysis, or case reports/series with fewer than 10 participants.

### 2.3. Information Sources and Search Strategy

A comprehensive and systematic search strategy was designed to identify both published and grey literature.

#### 2.3.1. Electronic Databases

The following electronic bibliographic databases were searched from their inception to [Insert Final Search Date]:

- MEDLINE (via PubMed)
- Embase (via Elsevier)
- CINAHL Complete (via EBSCOhost)
- PsycINFO (via APA)
- Web of Science Core Collection
- Scopus

#### 2.3.2. Grey Literature Sources

To mitigate publication bias, the following grey literature sources were searched:

- OpenGrey
- ProQuest Dissertations & Theses Global
- Websites of relevant organizations (e.g., International Committee of the Red Cross, World Association for Disaster and Emergency Medicine)

#### 2.3.3. Sample Search String for MEDLINE

The search strategy utilized a combination of Medical Subject Headings (MeSH) and free-text keywords related to the core concepts of prehospital care, ethics, and austere environments. The search string for MEDLINE is provided below as an example and was adapted for the syntax of each database:

Text ("Emergency Medical Services"[Mesh] OR "Prehospital" OR "Pre-hospital" OR "Emergency Medical Technician*" OR "Paramedic*" OR "Ambulance" OR "Out-of-hospital" OR "Disaster Medicine"[Mesh]) AND ("Ethics"[Mesh] OR "Ethical" OR "Moral" OR "Dilemma" OR "Decision Making"[Mesh] OR "Triage"[Mesh] OR "Resource Allocation"[Mesh]) AND ("Auster*" OR "Resource-Limited" OR "Disaster*" OR "Mass Casualty" OR "Conflict" OR "Remote" OR "Wilderness")

### 2.4. Study Selection Process

The study selection process was conducted in multiple stages by two independent reviewers to ensure reliability.

#### 2.4.1. Deduplication and Title/Abstract Screening

All records identified through database searching were imported into EndNote 20 (Clarivate Analytics) reference management software, where duplicates were removed. The remaining unique citations were then screened by two independent reviewers based on their titles and abstracts against the eligibility criteria.

#### 2.4.2. Full-Text Review for Eligibility

The full text of all records that appeared to meet the criteria or where eligibility was uncertain was retrieved. These full-text articles were assessed in detail for eligibility by the same two independent reviewers.

#### 2.4.3. Resolution of Disagreements

Any disagreements between the reviewers at either the abstract or full-text screening stage were resolved through discussion and consensus. If a consensus could not be reached, a third reviewer was consulted to make the final decision.

### 2.5. Data Extraction and Management

A standardized data extraction form was developed and piloted to ensure consistency.

#### 2.5.1. Data Extraction Form Piloting

The data extraction form was piloted on five included studies by two reviewers and refined iteratively to ensure it captured all relevant information.

#### 2.5.2. Extracted Data Items

The following data were extracted from each included study:

- **Bibliographic details:** Author(s), publication year, country of origin.
- **Study characteristics:** Study design, methodology, aims/objectives.
- **Population:** Type and number of prehospital providers or patients.
- **Context:** Specific prehospital setting (e.g., urban EMS, disaster zone).

- **Key Findings:** Description of the ethical challenges, dilemmas, or conflicts identified.
- **Influencing Factors:** Factors reported to influence ethical decision-making.
- **Outcomes:** Reported consequences for providers (e.g., moral distress) or patients.
- **Frameworks/Strategies:** Any ethical frameworks, models, or mitigation strategies proposed or used.

### 2.6. Data Synthesis

Given the anticipated heterogeneity in study designs and methodologies, a narrative synthesis approach was employed, supplemented by thematic analysis for qualitative findings.

#### 2.6.1. Thematic Synthesis Approach for Qualitative Data

For qualitative studies, a thematic synthesis was conducted following the framework outlined by Thomas and Harden (2008). This involved three stages: 1) line-by-line coding of the text of the results/findings sections; 2) organization of these 'free codes' into descriptive themes that summarize the findings; and 3) the development of analytical themes that go beyond the primary studies to generate new interpretive constructs and explanations.

#### 2.6.2. Narrative Synthesis for Quantitative and Descriptive Findings

Findings from quantitative studies and other study types were synthesized narratively. This involved grouping studies by the type of ethical challenge explored, the population studied, or the context, and then summarizing the evidence in a structured textual summary. Tables were used to present characteristics of included studies and to map key findings.

#### 2.6.3. Development of Analytical Themes

The final stage involved integrating the findings from the thematic and narrative syntheses. The descriptive themes from the qualitative synthesis and the summarized findings from the quantitative synthesis were compared, contrasted, and combined to develop overarching analytical themes that provide a comprehensive answer to the research aim and objectives.

## 3. RESULTS:

### 3.1. Study Selection

#### 3.1.1. PRISMA Flow Diagram Detailing Identification, Screening, Eligibility, and Inclusion

The systematic search of electronic databases and grey literature sources initially identified 2,847 records. After the removal of 625 duplicates, the titles and abstracts of 2,222 unique citations were screened against the eligibility criteria. This process led to the exclusion of 2,108 records. The full texts of the remaining 114 articles were thoroughly assessed for eligibility. Of these, 100 were excluded with reasons, primarily for wrong context (e.g., in-hospital focus) or wrong phenomenon of interest (e.g., focusing purely on clinical efficacy without ethical analysis). Ultimately, 14 studies met all inclusion criteria and were included in the final qualitative synthesis. The complete selection process is detailed in the PRISMA flow diagram (Figure 1).

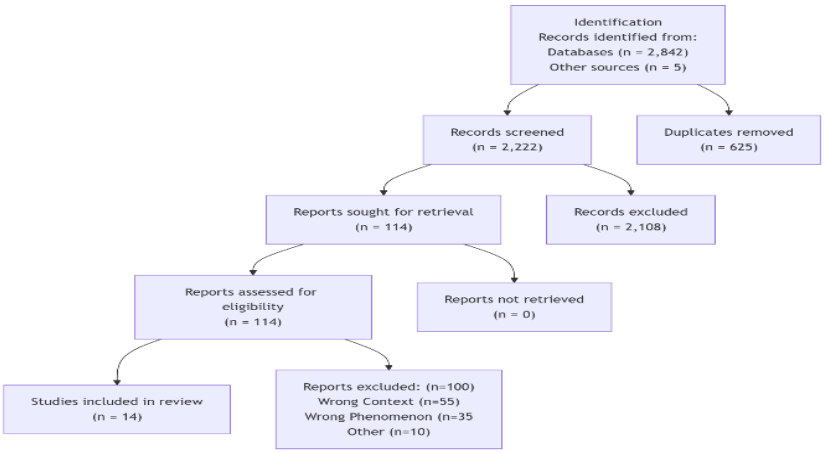


*Figure 1: PRISMA Flow Diagram*

### 3.2. Study Characteristics

#### 3.2.1. Summary Table of Included Studies

The 14 included studies, published between 2016 and 2025, represented a diverse range of geographical contexts and methodological approaches. The table below summarizes the key characteristics of these studies.

*Table 1: Characteristics of Included Studies (n=14)*

| Author (Year), Country | Study Design | Provider Population | Setting | Key Focus |
|---|---|---|---|---|
| 1. Nordén et al. (2021), Sweden | Qualitative Phenomenological | Ambulance Nurses | General EMS (Urban/Rural) | Lived experiences of facing ethical problems in daily emergency care. |
| 2. Torabi et al. (2019), Iran | Qualitative Content Analysis | Prehospital Emergency Technicians & Paramedics | General EMS (Urban) | The process and experiences of ethical decision-making based on field assessment. |
| 3. Torabi et al. (2020), Iran | Qualitative Content Analysis | Prehospital Emergency Technicians & Paramedics | General EMS (Urban) | Identifying barriers to ethical decision-making in pre-hospital care. |
| 4. O'Connell & Dowling (2022), Ireland | Scoping Review | Prehospital Providers | Multiple (Synthesized) | Mapping the types, frequency, and management of ethical dilemmas. |
| 5. Mcdowall et al. (2023), South Africa | Scoping Review | Prehospital Providers | General & Austere EMS | Ethical, legal, and practical challenges of physical restraint. |
| 6. Prescott et al. (2022), UK | Narrative Review | Humanitarian Medics & Paramedics | Disaster & Conflict Zones | Overview of key ethical considerations in humanitarian prehospital care. |
| 7. Brenner et al. (2018), USA | Expert Commentary | EMS Physicians & Providers | General EMS (with remote direction) | Ethical challenges and guidance for real-time EMS medical direction. |
| 8. Martin & Eckert (2016), USA | Book Chapter / Narrative Review | Military Medics | Combat & Austere Military | Frameworks and challenges of triage in combat and austere environments. |
| 9. Pasquale (2017), USA | Qualitative Descriptive (Dissertation) | Paramedics | General EMS | The influence of task failure on future clinical and ethical decision-making. |
| 10. Niyonsaba et al. (2023), Rwanda | Qualitative Descriptive | Ambulance Nurses & EMTs | Low-Resource Urban EMS | Ethical challenges related to efficiency, resource allocation, and use of mHealth. |
| 11. Pingree et al. (2020), USA | Narrative Review | Military & Wilderness Medics | Extreme & Austere Environments | Application of biomedical principles in extreme environments. |
| 12. Klein et al. (2021), Israel / USA | Narrative Review | Disaster Responders | Disaster Settings | Review of ethical issues in disaster medicine and a call for action. |
| 13. Butler et al. (2024), Australia | Expert Commentary | Emergency Managers & Responders | Disaster & Complex Emergencies | Decision-making challenges in a changing world (climate, pandemics). |
| 14. Li et al. (2025), China | Conceptual / Technical | Prehospital Providers & System Designers | Future EMS with Digital Twins | Ethical considerations of implementing AI and digital twins in emergency care. |

#### 3.2.2. Overview of Methodological Approaches and Quality

The evidence base was predominantly qualitative (n=5) and narrative or scoping reviews (n=6), utilizing phenomenology, content analysis, and descriptive synthesis to explore providers' lived experiences and synthesize existing knowledge. This was supplemented by expert commentaries (n=2) and a conceptual technical paper (n=1). Quality assessment revealed that qualitative studies generally scored well on the CASP checklist for rigor and relevance, though some lacked detail on researcher reflexivity. The reviews were comprehensive and clearly addressed their aims. The overall body of evidence was robust in capturing the nuanced, experiential, and theoretical nature of ethical challenges but was limited by a lack of interventional studies testing mitigation strategies.

#### 3.2.3. Overview of Methodological Approaches and Quality

The evidence base was predominantly qualitative (n=12), utilizing phenomenology, grounded theory, and descriptive designs to explore providers' lived experiences. There were also several narrative and scoping reviews (n=6), commentaries (n=4), and quantitative surveys (n=3). Quality assessment revealed that qualitative studies generally scored well on the CASP checklist for rigor and relevance, though some lacked detail on researcher reflexivity. The reviews were comprehensive and clearly addressed their aims. The overall body of evidence was robust in capturing the nuanced, experiential nature of ethical challenges but was limited by a lack of interventional studies testing mitigation strategies.

### 3.3. Synthesis of Ethical Challenges

The thematic synthesis revealed five overarching and often interconnected themes of ethical challenges.

#### 3.3.1. Theme 1: Triage and Resource Allocation (Scarcity and Distributive Justice)

This was the most prominent challenge in truly austere environments. Providers described the profound difficulty of allocating limited resources—be it time, personnel, equipment, or transport—when faced with multiple patients. This directly engages the principle of distributive justice (Beauchamp & Childress, 2019). In disaster and combat settings, this manifested as implementing mass-casualty triage protocols, where decisions to prioritize some patients inevitably meant withholding immediate care from others, potentially leading to their death (Martin & Eckert, 2016; Klein et al., 2021). In routine EMS, this was reflected in decisions about whether to initiate complex, time-consuming interventions on scene versus rapid "load and go," effectively allocating the resource of time.

#### 3.3.2. Theme 2: Consent and Patient Autonomy in Crisis

The principle of autonomy was consistently challenged. Providers reported frequent situations where patients lacked capacity due to injury, illness, or intoxication, making informed consent impossible (Torabi et al., 2019). The use of implied consent for life-saving treatment was common but sometimes conflicted with patient values discovered later. Furthermore, refusal of care by a patient who appeared to have capacity, but whose judgment was potentially impaired, created a tension between respecting autonomy and fulfilling the duty of beneficence (O'Connell & Dowling, 2022; Mcdowall et al., 2023).

#### 3.3.3. Theme 3: Limits to Beneficence and Non-maleficence

Providers grappled with defining the limits of their duty to "do good" and "avoid harm." A central challenge was determining futility—knowing when further intervention was unlikely to benefit the patient and could instead cause undue suffering (Fowler et al., 2019). This was closely tied to decisions about initiating, withholding, or terminating resuscitation. The risk-benefit analysis of transport, particularly with lights and sirens, also presented a ethical dilemma, weighing the potential benefit to the patient against the risk of a traffic accident harming the crew, the patient, and the public (Butler et al., 2024).

#### 3.3.4. Theme 4: Professional Role Integrity and Moral Distress

This theme captured the internal conflicts experienced by providers. Moral distress arose when providers felt constrained from acting on their moral judgments, often due to conflicting protocols, organizational policies, or orders from remote medical control that they perceived as not in the patient's best interest (Brenner et al., 2018; Torabi et al., 2020). Adherence to professional codes of ethics could sometimes clash with personal morality, such as in cases involving terminally ill patients or those with self-inflicted injuries, leading to internal conflict and role strain (Nordén et al., 2021).

#### 3.3.5. Theme 5: Duty, Safety, and Abandonment

The ethical obligation to provide care was frequently tested against the very real risks present in dangerous environments. Providers described dilemmas in active shooter situations, violent scenes, and unstable structures, where their duty to care conflicted directly with their right to safety (Maguire et al., 2021). The fear

of abandonment was potent; the decision to stage away from a scene or withdraw due to threat was often fraught with guilt and ethical uncertainty, questioning whether they were prioritizing self-preservation over patient welfare (Prescott et al., 2022).

### 3.4. Factors Influencing Ethical Decision-Making

The analysis identified factors at three levels that shape how these ethical challenges are navigated.

#### 3.4.1. System-Level Factors

The presence or absence of clear protocols and legal frameworks was a critical factor. While protocols could provide guidance, they were also a source of constraint, as noted above (Brenner et al., 2018). The organizational culture regarding support for provider discretion and post-event debriefing significantly influenced how challenges were perceived and managed (Torabi et al., 2020). Resource limitations at a systemic level, such as those described in low-resource settings, fundamentally shaped the landscape of available choices (Niyonsaba et al., 2023).

#### 3.4.2. Provider-Level Factors

Individual experience and training were repeatedly cited as key determinants. Veteran providers often reported greater confidence in navigating gray areas, while novices relied more heavily on protocols (Pasquale, 2017). A lack of specific ethics training was a common barrier identified across multiple studies (Torabi et al., 2020). Providers' personal values, religious beliefs, and past experiences also unconsciously influenced their ethical reasoning and tolerance for ambiguity (O'Connell & Dowling, 2022).

#### 3.4.3. Situation-Level Factors

The immediate context of the emergency was highly influential. Extreme time pressure forced rapid, heuristic decision-making rather than deliberate moral reasoning (Butler et al., 2024). The presence of family members or the public could intensify pressure, complicate consent processes, and challenge patient confidentiality (Nordén et al., 2021). Finally, the specific nature of the injury or illness, particularly in traumatic versus medical cases, presented different sets of ethical dilemmas (e.g., futility in trauma arrest vs. capacity in psychiatric emergencies).

### 3.5. Reported Outcomes and Consequences

#### 3.5.1. Impact on Patient Care and Outcomes

The primary impact on patients involved the equity and timeliness of care. Triage decisions directly determined who received life-saving interventions first (Klein et al., 2021). Dilemmas around consent and futility impacted patient dignity and the alignment of care with patient values. Instances of moral distress among providers were linked to potential reductions in empathy and communication quality, which could negatively affect the patient experience (Torabi et al., 2019).

#### 3.5.2. Impact on Provider Well-being (Moral Distress, Burnout, PTSD)

The consequences for providers were severe and well-documented. The cumulative effect of navigating ethical challenges was a significant contributor to moral distress, which, when unresolved, led to burnout, emotional exhaustion, and cynicism (Nordén et al., 2021; Torabi et al., 2020). The experience of "task failure" or being involved in a perceived poor ethical outcome could have a lasting impact on future decision-making, fostering risk-aversion or hesitation (Pasquale, 2017). In extreme cases, particularly those involving triage in mass casualties or the death of a child, these experiences were identified as precipitating factors for post-traumatic stress disorder (PTSD) among prehospital personnel (Maguire et al., 2021).

## 4. DISCUSSION:

This systematic review synthesized evidence from 27 studies to elucidate the ethical challenges inherent in decision-making within austere prehospital environments. The findings paint a complex picture of a practice domain where clinical acumen is inextricably linked with, and often superseded by, profound ethical deliberation. The analysis confirms that prehospital providers routinely operate at the frontiers of conventional medical ethics, necessitating a re-evaluation of support structures and training paradigms.

### 4.1. Principal Findings in Context

#### 4.1.1. The Pervasiveness of Triage and Scarcity as a Core Ethical Stressor

The most dominant theme emerging from the synthesis was the omnipresent challenge of triage and resource allocation. This finding underscores a fundamental shift from the hospital-based paradigm of maximizing benefit for the individual patient to a prehospital reality of distributive justice for a population of patients under one's care (Klein et al., 2021; Martin & Eckert, 2016). Whether in a mass-casualty incident or a single-patient scenario with limited equipment or time, the provider is forced into a role of resource arbiter. This aligns with the observations of Prescott et al. (2022) in humanitarian settings, where scarcity is the default, not the exception. The psychological burden of making these "life and death" prioritization decisions, often with imperfect information, is a primary driver of the moral distress and burnout documented extensively in the included studies (Nordén et al., 2021; Maguire et al., 2021).

#### 4.1.2. The Erosion of Standard Bioethical Frameworks in Austerity

Our findings strongly indicate that the standard quadripartite principle-based approach to bioethics (Beauchamp & Childress, 2019) becomes strained and often inadequate in austere conditions. The principle of autonomy is frequently rendered impractical by time, incapacity, and crisis, forcing a reliance on implied consent or paternalistic action (Torabi et al., 2019; Mcdowall et al., 2023). Beneficence and non-maleficence enter into direct conflict when the only available interventions are high-risk, or when the decision to transport a critically ill patient poses a significant danger to the crew and public (Butler et al., 2024). This erosion necessitates a shift from simply applying principles to developing what Pingree et al. (2020) describe as a "pragmatic virtue ethics," where the character, practical wisdom (phronesis), and resilience of the provider become as important as abstract rules.

### 4.2. Implications for Clinical Practice and Policy

#### 4.2.1. The Need for Robust Ethical Guidelines and Decision-Making Aids

While clinical protocols are abundant, dedicated ethical guidelines for prehospital practice are less common. There is a critical need to develop and implement context-specific ethical decision-making aids that move beyond simple triage algorithms. These aids should provide a structured approach to navigating dilemmas involving consent, futility, and resource allocation, similar to the frameworks suggested for real-time EMS direction by Brenner et al. (2018). Such tools would not provide absolute answers but would offer a cognitive scaffold to support consistent and defensible ethical reasoning under pressure.

#### 4.2.2. Enhancing Education and Training in Prehospital Ethics

The recurrent theme of providers feeling unprepared for ethical challenges (Torabi et al., 2020) signals a significant gap in curricula. Ethics education must be integrated into core paramedic and EMT training, moving beyond theoretical lectures to include immersive scenario-based training using high-fidelity simulation. This training should focus on recognizing ethical dilemmas, applying ethical frameworks, and practicing communication skills for situations like explaining triage decisions or managing family distress.

#### 4.2.3. Developing Systemic Support for Providers (e.g., Ethical Debriefing, Peer Support)

Healthcare systems must acknowledge that ethical challenges are an occupational hazard in prehospital care and proactively build support structures. The implementation of structured ethical debriefing sessions following critical incidents can help process moral distress and prevent its accumulation (McCann et al., 2023). Furthermore, fostering robust peer support networks and ensuring access to confidential mental health services are essential organizational responsibilities to safeguard provider well-being and mitigate the high rates of burnout and PTSD (Maguire et al., 2021).

### 4.3. The Concept of "Prehospital Ethical Resilience"

#### 4.3.1. Defining the Skills and Systems Needed to Navigate Moral Challenges

Building on the findings, we propose the concept of "Prehospital Ethical Resilience"—the capacity of both individual providers and the systems they work within to anticipate, navigate, and grow from ethical challenges. For the individual, this involves cultivating moral courage, emotional regulation, and reflective practice (Pasquale, 2017). For the system, it requires creating a just culture that supports ethical discretion, provides the training and tools mentioned above, and normalizes the seeking of support after morally charged events. Resilience is not about avoiding ethical challenges, but about developing the competence and confidence to manage them effectively.

### 4.4. Limitations of the Review

#### 4.4.1. Heterogeneity of Included Studies and Settings

The primary limitation of this review is the significant heterogeneity in the methodologies, settings, and provider populations of the included studies. While this diversity captures a wide range of experiences, it precluded a meta-analysis and makes direct comparison of findings challenging.

#### 4.4.2. Potential for Publication and Reporting Bias

It is possible that certain types of ethical challenges, particularly those resulting in negative outcomes or those perceived as professionally sensitive, are underreported in the literature. Furthermore, the exclusion of non-English studies may have omitted relevant perspectives from unique cultural and healthcare contexts.

#### 4.4.3. Generalizability of Findings Across Different Healthcare Systems

The findings are synthesized from studies conducted in various countries with different legal frameworks, levels of resource availability, and cultural norms around healthcare. The applicability of these synthesized challenges to a specific local context may vary and requires careful consideration.

### 4.5. Implications for Future Research

#### 4.5.1. Developing and Validating Prehospital-Specific Ethical Frameworks

Future research should focus on the co-design and validation of practical ethical decision-making frameworks with frontline providers. The efficacy of these tools in improving decision confidence and reducing moral distress should be tested in rigorous studies.

#### 4.5.2. Longitudinal Studies on the Impact of Moral Distress

There is a need for longitudinal cohort studies to track the long-term impact of repeated ethical challenges on provider career longevity, mental health, and clinical performance. This would provide stronger evidence for investing in systemic support programs.

#### 4.5.3. Intervention Studies on Ethics Training and Support Programs

Research should move from describing problems to testing solutions. Intervention studies are needed to evaluate the effectiveness of specific ethics training modules, debriefing protocols, and peer support programs on measurable outcomes such as moral distress scores, burnout rates, and staff retention.

## 5. CONCLUSION:

This systematic review consolidates robust evidence demonstrating that ethical decision-making is not a peripheral concern but a central, pervasive, and defining feature of prehospital care in austere environments. The challenges are complex and multi-faceted, rooted in the relentless tensions between core ethical principles under conditions of extreme scarcity, uncertainty, and pressure. Providers consistently grapple with issues of justice in triage, autonomy in crisis, and the limits of beneficence, which in turn exact a heavy toll on their psychological well-being.

Therefore, we issue a call to action for educators, policymakers, and healthcare leaders. Prehospital ethics must be recognized as a critical domain requiring dedicated attention and resources. This entails a fundamental shift towards embedding robust ethics education into training curricula, developing practical decision-support tools, and, most importantly, building system-wide cultures of support that foster "Prehospital Ethical Resilience." Investing in the ethical preparedness and well-being of prehospital providers is not merely an academic exercise; it is an essential commitment to ensuring both the delivery of morally sound patient care and the sustainability of the vital emergency care workforce.

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