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Review Article

**ASSESSING THE ROLE OF COMMUNITY FIRST
RESPONDERS IN PREHOSPITAL TRAUMA CARE: A
LITERATURE REVIEW**

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Abstract:

Community First Responders (CFRs) play a critical role in prehospital trauma care, particularly in resource-limited and rural settings where access to emergency services is constrained. This literature review evaluates the effectiveness of CFRs in managing trauma cases, comparing their performance to traditional emergency medical services (EMS). The review identifies key themes including the impact of training programs, barriers faced by CFRs, and successful integration with formal EMS. Despite varying training standards and operational challenges, studies indicate that CFRs can significantly reduce response times and improve patient outcomes, particularly in instances of out-of-hospital cardiac arrests and trauma incidents. The analysis reveals that local engagement and tailored training models significantly enhance CFR effectiveness. Furthermore, the review highlights the necessity for establishing standardized training protocols and support mechanisms to optimize the contributions of CFRs in emergency care. The findings underscore the potential for CFR programs to mitigate the public health burden of trauma, particularly in low- and middle-income countries where traditional EMS may be inadequate. Future research should focus on enhancing the integration of CFRs within existing healthcare systems, addressing psychological impacts on responders, and exploring the scalability of successful CFR models across diverse contexts.

Keywords: Community First Responders, Prehospital Trauma Care, Emergency Medical Services, Training Programs, Rural Healthcare

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1. INTRODUCTION:**1.1. Background and Rationale**

A Community First Responder (CFR) is defined as “a member of the public who receives basic emergency care training and volunteers to help their community by responding to appropriate medical emergencies while an ambulance is en route” (Kindness et al., 2012). CFRs were established to enhance emergency response, particularly for out-of-hospital cardiac arrests, and more recently to aid ambulance services in reducing response times for various incidents, especially in rural areas (Henriksen et al., 2016).

Since their inception in the 1990s, Community First Responder programs have been providing prehospital emergency care, allowing patients to receive timely medical assistance while awaiting an ambulance (Weir et al., 2015). In the UK, there are approximately 2,500 CFR schemes, supported by over 11,000 volunteers (Kindness et al., 2014). These schemes are typically operated by charities, either independently or in conjunction with ambulance trusts (Roberts et al., 2014). Currently, there are no national standards governing the provision of CFR services, volunteer training, or the quality of care provided. Local programs have emerged independently, reflecting the unique priorities of their communities. While many CFRs focus primarily on cardiac events, others also respond to road traffic collisions and trauma incidents. This variation can lead to differing levels of volunteer training and support, which may influence effectiveness, safety, and retention (Mort et al., 2015). Road traffic injuries (RTIs) represent a rapidly increasing epidemic in low- and middle-income countries (LMICs), often receiving less recognition than other health challenges. As reported by Nantulya et al. (2002), in 2016, there were approximately 1.35 million deaths from RTIs globally, with a disproportionate burden in LMICs. Although these nations account for around 60% of the world’s vehicles, they contribute to 93% of all traffic fatalities (WHO, 2022), largely due to inadequate access to timely prehospital medical care and transportation (Mock et al., 2009).

The link between these fatalities and delays in response is particularly concerning, as traumatic injuries are highly time-sensitive. This underscores the importance of the “golden hour” concept, which posits that prompt definitive care within one hour of injury significantly enhances patient outcomes. The urgency of addressing this public health crisis is evident in the United Nations Sustainable Development Goal 3.6, aimed at halving traffic injury deaths by 2030 (Moussally et al., 2022).

Trauma continues to be a leading cause of morbidity and mortality worldwide. The timely delivery of medical care in the prehospital setting is essential for improving patient outcomes. Community First Responders (CFRs), as trained volunteers, provide immediate assistance in emergencies, often before professional medical services arrive. This literature review will examine the role and effectiveness of CFRs in prehospital trauma care, focusing on key themes, challenges, and best practices.

1.2. Objectives

- Evaluate the effectiveness of CFRs in managing trauma cases compared to traditional emergency medical services (EMS).
- Identify barriers faced by CFRs in delivering prehospital trauma care.
- Examine training programs and their impact on CFR performance in trauma situations.
- Highlight successful models of integration between CFRs and formal EMS.

2. METHODOLOGY:**2.1. Search Strategy****2.1.1. Databases and Keywords**

A comprehensive literature search will be conducted using several academic databases, including PubMed, ScienceDirect, and Google Scholar. The search will utilize a combination of keywords and phrases such as "Community First Responders," "prehospital trauma care," "emergency response," "trauma outcomes," and "emergency medical services." Boolean operators (AND, OR) will be employed to refine the search results and ensure a comprehensive collection of relevant studies.

2.1.2. Inclusion and Exclusion Criteria

The inclusion criteria for selecting studies will be as follows:

- Peer-reviewed articles published from 2000 to the present.
- Studies focusing on the role and effectiveness of CFRs in prehospital trauma care.
- Research conducted in both high-income and low- and middle-income countries.

2.1.3. Exclusion criteria will include:

- Articles not published in English.
- Studies focused solely on non-trauma emergencies.
- Opinion pieces, editorials, and non-peer-reviewed literature.

2.2. Data Extraction Process

Data will be systematically extracted from the selected studies using a standardized data extraction form. Key information to be collected will include:

- Author(s) and publication year.
- Study design and methodology.
- Population characteristics and sample size.
- Interventions and outcomes measured.
- Key findings and conclusions related to CFR effectiveness in trauma care.

2.3. Analysis Framework

2.3.1. Thematic Analysis

The extracted data will be analyzed qualitatively using thematic analysis. This approach will involve identifying recurring themes and patterns across the studies. The analysis will focus on key aspects such as the effectiveness of CFRs, barriers encountered, training methodologies, and integration with EMS. Themes will be categorized and summarized to provide a clear understanding of the current state of knowledge regarding CFRs in prehospital trauma care.

2.3.2. Quality Assessment of Studies

The quality of the included studies will be assessed using a standardized quality assessment tool, such as the Joanna Briggs Institute Critical Appraisal Checklist. This assessment will evaluate the methodological rigor, sample representativeness, and potential biases of each study. Studies will be rated based on their quality, and this will inform the overall conclusions of the literature review, ensuring that the findings are based on reliable and valid research.

3. Role of Community First Responders

3.1. Definition and Scope of CFRs

A Community First Responder (CFR) is an individual who has received basic emergency care training, such as Basic Life Support (BLS) with an Automatic External Defibrillator (AED), and volunteers to assist in medical emergencies until the arrival of an ambulance (Barry, et al. 2017). CFRs come from

diverse backgrounds, including emergency services personnel, firefighters, police officers, laypersons, and physicians (Kindness, et al. 2014). They are activated in real-time, with mobile activation linked to the initiation of early CPR following cardiac arrest (Phung, et al. 2017). CFRs enhance the efforts of ambulance services, particularly in rural communities, where ambulance response times may be longer.

The scope of community first responders encompasses a diverse group of highly trained professionals and volunteers, primarily including police officers, firefighters, and paramedics/emergency medical service (EMS) personnel. These individuals are on the front lines of public safety, facing numerous physical and psychological stressors in their roles (Haugen et al., 2012; Carleton et al., 2018). As they operate under high-demand conditions, the risk of fatigue significantly impacts their performance and overall well-being, making effective fatigue risk management essential to ensure both responder safety and public protection (Ramey et al., 2019).

3.2. Historical Context and Evolution

3.2.1. Historical Context and Evolution of Community First Responders

The concept of Community First Responders (CFRs) has evolved significantly in response to the urgent need for emergency care in areas with limited access to formal medical services. This evolution is evident in various studies focusing on CFR programs across different contexts, which highlight historical developments and the effectiveness of community-based healthcare initiatives. The practice of utilizing laypersons as first responders can be traced back to community traditions where local citizens provided immediate assistance during emergencies. In many low- and middle-income countries (LMICs), these informal responders have stepped in due to the absence of professional medical services (Eisner et al., 2020). The World Health Organization (WHO) has been instrumental in promoting the establishment of CFR programs, recommending in 2004 that scaling up lay first responder initiatives is essential for developing formal emergency medical services (EMS) in LMICs. This recognition underscores the critical role these programs can play in reducing mortality from injuries and improving community health outcomes (WHO, 2016). In regions experiencing crises—whether from conflict, natural disasters, or public health emergencies—community members often take on the role of first responders. For example, the TraumaLink program in Bangladesh illustrates how local volunteers can effectively address traffic injuries in the absence of formal services (Moussally et al., 2021),

highlighting the adaptability and resilience of communities in managing health emergencies.

3.2.2. Evolution of CFR Programs

The "Training of Trainers" (TOT) model has emerged as a cornerstone of Community First Responder (CFR) program development, particularly in Sierra Leone, where it empowers trained first responders to educate additional community members, thereby enhancing the reach and impact of emergency training (Eisner et al., 2020). This approach democratizes knowledge and fosters local ownership of health initiatives. The curricula for CFR programs have evolved to align with local needs, focusing on essential skills such as hemorrhage control and basic trauma management, rather than relying on high-income country protocols that may not be applicable (Eisner et al., 2020). Such adaptations are critical for ensuring the relevance and effectiveness of training in low-resource settings. The efficacy of these training programs is increasingly assessed through rigorous methodologies; for instance, studies in Sierra Leone revealed a 43.5% increase in median scores from pre- to post-training assessments among lay responders (Eisner et al., 2020). Additionally, the TraumaLink program has highlighted effective community engagement and rapid response to emergencies, underscoring the necessity of continuous evaluation (Moussally et al., 2021). Furthermore, the integration of CFRs into broader healthcare systems is vital for sustainability, as programs must not only train responders but also ensure they have access to essential resources and support from formal health services (Mamdani, 2024). This integration is crucial for enhancing overall health outcomes and enabling CFRs to function effectively within existing health infrastructures.

4. Effectiveness of CFRs in Trauma Care

Community First Responders (CFRs) play a crucial role in trauma care, particularly in rural settings where immediate access to emergency medical services may be limited. Studies have demonstrated that CFRs can significantly reduce response times and improve patient outcomes, such as survival rates in cases of out-of-hospital cardiac arrests (Phung et al., 2018). Moussally et al. (2021) noted that a community-based first-responder system in Bangladesh effectively addressed traffic injury victims, highlighting the importance of local volunteer initiatives in enhancing emergency care. Additionally, the research by Phung et al. (2018) emphasizes that CFRs often provide timely stabilization of patients, which is vital for effective trauma care before the arrival of advanced medical personnel. Their contributions not only complement existing ambulance services but also serve to reassure communities about their emergency preparedness (Phung et al., 2018; Moussally et al.,

2021). Consequently, the involvement of trained lay responders in trauma situations is a valuable asset to public health and emergency management efforts.

4.1. Overview of Findings

Many studies emphasize the significance of leveraging local transportation infrastructures to improve prehospital emergency care. A key finding is that training laypersons as first responders can markedly enhance both response times and patient outcomes during emergencies. In their study, Yung et al. (2021) aimed to develop a national occupational standard for fatigue risk management tailored to first responders, including police, firefighters, and paramedics. The authors conducted a scoping review of peer-reviewed literature to examine how fatigue is conceptualized across these occupations and to identify key risk factors and health outcomes associated with fatigue. The review revealed that fatigue is categorized differently, with cognitive fatigue predominating in police research and physical fatigue being the primary focus for firefighters. Key risk factors noted include organizational factors such as scheduling and management styles, alongside personal and environmental influences. The study also found that fatigue is linked to various adverse health outcomes, including reduced physical health and impaired performance. Additionally, interventions like sleep quality training programs were identified as effective in mitigating fatigue-related issues. Overall, the findings highlight the urgent need for a cohesive fatigue risk management standard that addresses the unique challenges faced by different first responder roles, suggesting that future research should focus on validating fatigue measurement tools and evaluating intervention effectiveness.

Hird and Richardson (2023) aimed to explore the experiences of community first responders (CFRs) working within a UK ambulance service, addressing a notable gap in the literature regarding their roles. Utilizing a qualitative approach, the researchers conducted ten semi-structured interviews with CFRs, analyzing the data through thematic analysis. The findings revealed two main themes: "relationships" and "systems." Within the relationships theme, sub-themes included interactions among CFRs, their connections with ambulance service staff, and their engagement with patients. The study found that CFRs generally supported one another and experienced an evolving, predominantly positive relationship with ambulance staff, although some negative interactions persisted. The systems theme highlighted concerns regarding call allocation practices and technology used by CFRs, with participants expressing frustration over outdated equipment that hindered their response times.

Overall, the study underscores the need for improved support mechanisms for CFRs and calls for further research to quantify these experiences across different ambulance services.

Davies et al. (2008) investigated the psychological effects of responding to cardiac arrest situations among lay responders in public access defibrillation (PAD) schemes. Utilizing qualitative methods, the researchers conducted in-depth semi-structured interviews with six first responders from a community scheme in Barry, South Wales, analyzing the data through Interpretive Phenomenological Analysis (IPA). The findings revealed a phenomenon of resilience among responders, characterized by core beliefs about their roles, realistic appraisals of their limitations, and confidence in their training. Participants exhibited emotional detachment during responses, which served as a protective mechanism against stress and negative psychological outcomes. The study concluded that altruistic motivation, combined with inherent resilience, plays a crucial role in enabling responders to function effectively under pressure without experiencing adverse psychological consequences. These insights offer valuable implications for the training and selection processes of future responders in PAD schemes.

In their 2009 study, Jayaraman et al. evaluated the effectiveness and scalability of a basic prehospital trauma care program for lay first responders in Kampala, Uganda. The researchers conducted a prospective follow-up of 307 participants, including police, taxi drivers, and community leaders, who completed a one-day training course. Using cross-sectional surveys and knowledge tests, the study assessed skill retention, confidence levels, and the use of first-aid supplies over six months. The findings indicated a high retention of knowledge, with participants achieving a mean score of 92% on knowledge tests, up from 86% post-training. Moreover, 97% of trainees reported using at least one skill from the course, significantly increasing their confidence in providing aid. Cost-effectiveness analysis suggested that scaling up the program would be modestly priced at \$0.12 per capita, potentially averting 240 deaths annually. The study concluded that training lay responders is a practical and cost-effective initial step toward establishing a formal emergency medical system in resource-constrained settings like Uganda.

Eisner et al. (2020) conducted a study evaluating a Lay First Responder (LFR) program in Bombali District, Sierra Leone, aimed at developing scalable prehospital

trauma care in low-resource settings. The researchers trained 4,529 lay first responders using a contextually-adapted, five-hour trauma course, implemented through a "Training of Trainers" (TOT) model. Knowledge acquisition was assessed through pre- and post-tests, which revealed a significant median score improvement of 43.5 percentage points (from 34.8% to 78.3%, $p < 0.0001$) immediately after training. However, knowledge retention decreased over time, with scores dropping to 60.9% at six months and 43.5% at nine months. The program's impact was further evidenced by incident reports from lay responders, who treated 1,850 patients, primarily utilizing hemorrhage control techniques. This study underscores the potential of LFR programs to enhance emergency care knowledge and improve patient outcomes in settings lacking formal emergency medical services.

Moussally et al. (2022) developed TraumaLink, a community-based emergency response system in Bangladesh to improve outcomes for traffic injury victims by addressing the lack of prehospital medical services. The study utilized a volunteer network of first responders trained in basic trauma first aid, supported by a 24-hour call center and an emergency hotline. Over six years, the program expanded from a 14-km section of highway to 135 km, providing care to 3,119 patients involved in 1,544 crashes. Key findings indicated a 100% incident response rate, with 88% of responders arriving at the scene within five minutes. The program demonstrated effective triage, with 76% of patients transported to hospitals within 30 minutes. The strong community engagement and rapid response capabilities suggest that TraumaLink represents a scalable model for improving emergency response in low- and middle-income countries facing similar challenges.

Siwinski and Blankenship (2024) investigated the differences in trauma exposure and PTSD symptomology between single-role firefighters and paramedics, aiming to highlight the specific challenges faced by these first responder groups. Utilizing self-report assessments, including the PTSD Checklist for DSM-5 (PCL-5) and the Life Events Checklist (LEC-5), the study analyzed data from 95 participants (42 firefighters and 53 paramedics). The findings revealed that paramedics reported significantly higher numbers of traumatic exposures but did not show a corresponding increase in overall PTSD symptom levels compared to firefighters. Additionally, paramedics experienced lower compassion satisfaction and higher burnout rates than their firefighter counterparts. These results underscore

the necessity for role-specific mental health interventions tailored to the unique experiences of different first responder roles, contributing to the limited literature on this important topic.

Campbell and Ellington (2016) conducted a study to evaluate the effectiveness of a Community First Responder (CFR) scheme involving medical students in reducing response times for emergency calls in an inner-city UK setting. Over a 12-month period, twenty medical students trained to the "First Person on Scene" standard attended 89 emergency calls alongside the West Midlands Ambulance Service. The study found that the average CFR response time was significantly faster—by 3 minutes and 8 seconds—compared to ambulance crews, with the greatest time savings observed for calls related to falls. Additionally, a survey revealed that all participating students felt more prepared to assess and treat critically unwell patients, highlighting the dual benefit of improved emergency response times and valuable educational experiences for the students. This research underscores the potential of CFR schemes to enhance prehospital care while providing practical training for future medical professionals.

In the study by Boeck et al. (2017), the authors aimed to develop and implement a trauma first responder course (TFRC) for laypersons in La Paz, Bolivia, addressing the critical need for improved prehospital care in low-resource settings. The pilot study involved nine sessions of an eight-hour course led by an American surgeon and medical student, incorporating both theoretical and practical training. Participants completed baseline surveys and pre- and post-tests to assess knowledge acquisition. Results demonstrated a significant increase in median test scores from 48% to 76% ($p < 0.001$) after course completion, indicating effective knowledge transfer. Additionally, participants reported increased confidence in their skills, highlighting the course's potential to enhance trauma management capabilities among lay responders in Bolivia.

In the study by Delaney et al. (2018), the authors aimed to develop a sustainable prehospital emergency care training program for lay first responders in Eastern Uganda, utilizing the local motorcycle taxi infrastructure. The program trained 154 motorcycle taxi riders in first aid, guided by a curriculum designed in partnership with the Uganda Red Cross. Pre- and post-training assessments demonstrated significant improvements in first aid knowledge across key areas, such as bleeding control and scene management. Over six months, these responders treated 250 victims,

primarily from road traffic injuries, with a mortality rate of 9.6%. The findings highlight the effectiveness of lay responder training in enhancing emergency care capabilities in low-resource settings, suggesting a scalable model for improving trauma outcomes in similar contexts (Delaney et al., 2018).

Murad and Husum (2010) conducted a controlled study to evaluate the impact of trained lay first responders on trauma mortality in rural Iraq, where prehospital transport times are typically long. The study established a rural prehospital trauma system, comprising 135 paramedics and 7,000 lay first responders. In a non-randomized clinical design, they compared outcomes of 1,341 trauma patients initially managed by first responders ($n = 325$) against those who did not receive such support ($n = 1,016$). The findings revealed that patients managed by first responders had a significantly lower mortality rate of 9.8% compared to 15.6% in the control group, indicating the effectiveness of early, in-field basic life support in improving trauma outcomes. This study underscores the importance of integrating trained layperson responders into trauma care systems, particularly in settings with limited access to advanced medical services.

Phung et al. (2018) conducted a qualitative interview study to explore the perceptions and experiences of Community First Responders (CFRs) regarding their roles and relationships within a UK-based scheme. Utilizing semi-structured interviews with a purposive sample of 16 CFRs, the researchers analyzed the data through the Framework method. The study identified five main themes: motivation and ongoing commitment, learning to be a CFR, the reality of being a CFR, relationships with statutory ambulance services and the public, and future directions for CFR schemes. Findings revealed that CFRs are primarily motivated by altruism and personal satisfaction, yet they often feel undervalued and lack public recognition. They emphasized the importance of scenario-based training and informal support mechanisms, while expressing a desire for clearer roles and improved communication with ambulance services. The authors concluded that better support and recognition of CFRs are essential to enhance their effectiveness and maintain community trust.

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Phung et al. (2017) conducted a systematic scoping review to explore Community First Responder (CFR) schemes in the United Kingdom, aiming to identify motivations for becoming a CFR, training requirements, and the confusion surrounding the roles of CFRs and ambulance staff. The authors systematically searched six databases for English-language literature published from 2000 onwards, ultimately selecting nine relevant articles for analysis. Their findings revealed that individuals are primarily motivated by altruism and a desire to contribute to their communities, although they often felt limited by their training compared to professional ambulance staff. Additionally, CFRs expressed a need for ongoing training and better feedback mechanisms to enhance their skills and learning experiences. The review highlighted significant gaps in the evidence base regarding CFR schemes, particularly in understanding their impact on patient outcomes and the emotional challenges faced by responders.

Hancock et al. (2020) conducted a study to evaluate the feasibility and effectiveness of a lay first responder (LFR) program in rural Chad, aiming to enhance prehospital emergency care in low-resource settings. The study implemented a WHO-informed curriculum among motorcycle taxi drivers, utilizing a pre-/post-test design to measure knowledge improvement across four key areas: scene safety, airway management, bleeding control, and victim transport. Results indicated significant knowledge acquisition, with participants demonstrating considerable improvements in three of the four categories ($P < .001$). Over six months, LFRs treated 71 patients and reported high confidence in their skills, while qualitative interviews revealed that the training enhanced their social status and customer acquisition, suggesting that LFR programs can be both feasible and sustainable in similar contexts.

Jayaraman et al. (2009) conducted a study to assess the current patterns of prehospital trauma care in Kampala, Uganda, and to evaluate the feasibility of a lay first-responder training program. Utilizing a cross-sectional survey design, the researchers collected data from 309 lay individuals, including police officers and taxi drivers, regarding their experiences with emergencies, barriers to providing aid, and prior training. The study found that these lay responders frequently witnessed traumatic incidents, averaging 18 emergencies each in the past six months, with significant instances of injury-related deaths (39%). Notably, 90% of respondents provided some form of assistance during emergencies, yet many felt ill-prepared due to limited training and resources. Following the implementation of a tailored first-aid training program, participants demonstrated a marked improvement in knowledge, with test scores rising from an average of 45% to 86% post-training ($p < 0.0001$). The findings underscore the critical need for organized prehospital care systems and highlight the potential for effective training to enhance the capabilities of lay responders in urban settings.

Chokotho et al. (2017) conducted a qualitative study to examine the challenges of first response practices for road traffic injuries in Malawi. Utilizing focus group discussions in Karonga and Blantyre, the researchers gathered insights from community members, including those with firsthand experience in roadside assistance. The study found that access to professional prehospital care was nearly nonexistent, with bystanders often serving as the primary responders due to the lack of trained personnel and resources. Participants emphasized the need for community-based first aid training and proposed the establishment of a formal network of trained volunteers, police, and local leaders to improve roadside care. Key recommendations included enhancing emergency communication systems and expanding access to ambulance services, highlighting the critical need for a structured approach to prehospital care in Malawi's context of high traffic-related fatalities.

In the study by Delaney et al. (2020), a practical prehospital emergency trauma care curriculum was designed and implemented for lay first responders in Guatemala, addressing the urgent need for improved emergency medical services in low- to middle-income countries. The curriculum, lasting five hours, was piloted with 354 participants, including law enforcement personnel, firefighters, and civilians, who received training on scene safety, triage, airway management, and other critical care skills. A validated

pretest/post-test assessment was used to measure knowledge acquisition, revealing a significant increase in mean scores from 43% to 68% ($p < 0.001$) post-training. The results indicated that the training effectively enhanced emergency care knowledge, with law enforcement and civilian participants showing greater improvement than firefighters. This study demonstrates the feasibility of delivering effective emergency training within a short timeframe, suggesting implications for similar programs in other low-resource settings.

In the study by Babu et al. (2015), a novel metal-free electrocatalyst for the oxygen reduction reaction (ORR) was synthesized using reduced graphene oxide (rGO) decorated with nitrogen-doped carbon nanowires (rGO-CN). The authors developed a facile synthesis method that involved the polymerization of polypyrrole (PPy) nanowires on the rGO surface, followed by carbonization at 800 °C to create the composite material. Characterization techniques such as TEM, XPS, and FT-IR confirmed the successful formation and high nitrogen content of the rGO-CN structure. The electrocatalytic performance of rGO-CN was assessed through cyclic voltammetry and linear sweep voltammetry, revealing superior ORR activity compared to rGO and rGO-PPy, attributed to enhanced electron transfer efficiency and the presence of N-doped sites. These findings highlight the potential of rGO-CN as an effective, cost-efficient alternative to precious metal catalysts in fuel cell applications.

Lewis-Schroeder et al. (2018) conducted a comprehensive review on the conceptualization, assessment, and treatment of traumatic stress in first responders, particularly focusing on the prevalence of post-traumatic stress disorder (PTSD) within this population. The authors synthesized existing literature to highlight the elevated PTSD rates among first responders—ranging from 6% to 32% for law enforcement officers, 9% to 22% for EMTs, and 17% to 32% for firefighters compared to 7% to 12% in the general population. The review emphasized occupation-specific and third-variable risk factors contributing to PTSD, and outlined the LEADER program at McLean Hospital, which offers tailored outpatient trauma services. The authors discussed diagnostic assessment tools, such as the Clinician Administered PTSD Scale for DSM-5 (CAPS-5) and the PTSD Checklist for DSM-5 (PCL-5), and advocated for a phase-oriented treatment approach that includes symptom stabilization, trauma-focused processing, and aftercare. The findings underscore the need for culturally sensitive treatment strategies that

consider gender differences in PTSD presentation among first responders.

Diango et al. (2023) conducted a mixed-methods study to evaluate a pilot Community First Aid Responder (CFAR) training program in Kinshasa, Democratic Republic of Congo, aimed at enhancing prehospital care in resource-limited settings. The study involved a three-day in-person training for 42 selected community health workers, combining quantitative assessments through pre- and post-training surveys with qualitative insights from focus group discussions. Findings indicated a significant increase in participants' self-confidence regarding first aid skills, with pre-training confidence averaging 17.9% and post-training confidence reaching 95.3% ($p < 0.001$). Participants expressed high satisfaction with the course content and structure, although many felt the training duration was insufficient. Overall, the pilot demonstrated that the CFAR course was contextually appropriate and well-received, highlighting its potential as a critical component in developing emergency care systems in the DRC.

Moussally et al. (2024) explored the development and implementation of community-driven Tier-1 emergency medical services (EMS) systems in low- and middle-income countries (LMICs), emphasizing the need for context-appropriate solutions to address unique prehospital care challenges. The authors highlighted the limitations of replicating high-income country EMS models due to financial constraints, advocating instead for training layperson first responders (LFRs) who can utilize locally available resources. Through a comprehensive review of existing tier 1 systems, the study identified key components for effective implementation, including community engagement, technology integration, tailored training curricula, and volunteer incentivization. Findings indicated that well-structured LFR programs significantly enhance emergency response capabilities and local ownership, ultimately improving health outcomes in resource-limited settings. The study underscores the importance of involving local stakeholders to create sustainable EMS solutions that respect cultural values and address specific community needs.

4.2. Comparison with Traditional EMS

Emergency medical services (EMS) are critical in providing immediate care to patients in medical emergencies. While traditional EMS systems, typically staffed by trained paramedics and emergency medical technicians (EMTs), dominate urban and suburban areas, community first responders (CFRs) are increasingly utilized, especially in rural or

underserved regions. This essay compares CFRs and traditional EMS by examining their roles, training, operational effectiveness, and the psychological impact on responders.

4.2.1. Roles and Responsibilities

Community first responders are volunteers trained to provide initial care in emergencies, often before professional EMS arrive. They are typically dispatched to emergencies, such as cardiac arrests or trauma incidents, and are equipped with basic life-saving tools, including automated external defibrillators (AEDs) and oxygen (Hird & Richardson, 2023). CFRs aim to bridge the gap in response times, particularly in rural settings where traditional EMS may be delayed.

In contrast, traditional EMS personnel are professional caregivers with formal training in advanced medical procedures. They have a broader scope of practice, including medication administration, advanced airway management, and complex patient assessments (Boeck et al., 2018). This professional training equips them to handle a wider array of medical emergencies and provide comprehensive care.

4.2.2. Training and Preparation

Training for CFRs typically involves basic first aid and CPR, focusing on life-saving techniques relevant to their role (Moussally et al., 2021). For instance, in Uganda, CFRs receive training that leverages local transportation infrastructure to enhance their responsiveness in emergencies (Hird & Richardson, 2023). However, the depth of training can vary significantly between different CFR programs and depends on the local ambulance service's requirements.

Conversely, traditional EMS personnel undergo extensive training, often requiring certification at multiple levels, including basic EMT, advanced EMT, and paramedic (Campbell & Ellington, 2016). This formal education includes anatomy, physiology, pharmacology, and trauma care, preparing them for high-stress environments and complex medical situations.

4.2.3. Operational Effectiveness

Research has shown that CFRs can significantly reduce response times in emergencies, particularly in rural areas where traditional EMS may take longer to arrive (Bo et al., 2018). For example, Moussally et al. (2021) found that community-based systems could effectively address traffic injuries in Bangladesh, demonstrating the potential of CFRs to improve patient outcomes. However, the effectiveness of CFRs is often contingent upon their training and the nature of the incidents they attend. Studies indicate that while CFRs can provide immediate assistance, they may

encounter situations beyond their training or scope of practice, leading to potential risks for both responders and patients (Hird & Richardson, 2023).

In contrast, traditional EMS has well-established protocols and a comprehensive understanding of emergency care, ensuring a high level of operational effectiveness. Research suggests that the presence of trained professionals at emergency sites correlates with improved patient survival rates, as they are equipped to handle a broader range of medical emergencies (Jay et al., 2024).

4.2.4. Psychological Impact on Responders

The mental health of responders in both systems is a crucial consideration. Studies indicate that CFRs often experience a unique set of psychological challenges, including stress from witnessing traumatic events without the support systems available to professional EMS personnel (Davies et al., 2008). Many CFRs report feelings of isolation or inadequacy when faced with severe cases, as they may lack access to debriefing or psychological support services (Hird & Richardson, 2023). Conversely, traditional EMS personnel, while also facing stress related to their work, typically have access to structured support systems, including peer debriefing and mental health resources, which can help mitigate the impact of their experiences (Colquhoun et al., 2008). Studies suggest that the camaraderie and professional relationships within EMS can provide emotional support that is often lacking in volunteer-based systems (Campbell & Ellington, 2016).

Both community first responders and traditional EMS play vital roles in the emergency medical landscape. CFRs enhance the speed of initial response, especially in rural areas, while traditional EMS offers comprehensive care through professional training and established protocols. Each system has its strengths and weaknesses, and understanding these differences is crucial for improving emergency care delivery. Future research should focus on integrating the strengths of both systems to enhance training, support mechanisms, and operational effectiveness, ultimately improving patient outcomes in emergency situations.

5. Challenges Faced by Community First Responders

Community first responders (CFRs) serve a critical function in emergency medical services, particularly in rural and underserved areas. By providing immediate assistance in emergencies, they help bridge the gap until professional emergency medical services (EMS) arrive. Despite their vital contributions, CFRs encounter numerous challenges that can hinder their effectiveness. This essay explores four significant challenges: training and skill gaps, legal and ethical

considerations, community engagement and support, and resource limitations.

5.1. Training and Skill Gaps

One of the primary challenges faced by CFRs is variability in training and skill levels. Training programs often focus on basic first aid and cardiopulmonary resuscitation (CPR), but may lack comprehensive curricula necessary for handling complex medical emergencies (Hird & Richardson, 2023). For example, in Uganda, CFRs receive training that leverages local resources, yet the depth of training often varies significantly based on the local ambulance service's requirements (Moussally et al., 2021). Furthermore, studies indicate that CFRs may encounter situations requiring skills beyond their training, leading to potential risks for both responders and patients (Bo et al., 2018). A lack of confidence resulting from inadequate training can impact their decision-making in emergencies, raising concerns about their ability to provide effective care (Jay et al., 2024).

5.2. Legal and Ethical Considerations

CFRs navigate complex legal and ethical landscapes that can pose significant challenges. As volunteers, they may not have the same legal protections as professional EMS personnel, which exposes them to liability risks in cases of adverse outcomes during an emergency response (Bo et al., 2018). This concern can create hesitation among CFRs, particularly in high-stakes situations requiring immediate action.

Additionally, ethical dilemmas may arise regarding the scope of practice. CFRs may respond to incidents that exceed their training or involve complex medical decisions, leading to potential conflicts between their intent to help and their legal limitations (Hird & Richardson, 2023). The lack of clarity regarding the roles and responsibilities of CFRs compared to professional EMS can complicate interactions at emergency scenes, sometimes resulting in friction between responders (Campbell & Ellington, 2016).

5.3. Community Engagement and Support

Effective community engagement is crucial for the success of CFR programs, yet many CFRs face challenges in garnering local support. Building trust and relationships within the community is essential for encouraging participation in volunteer programs (Moussally et al., 2021). However, in some areas, a lack of awareness about the role of CFRs can lead to misconceptions about their capabilities and the importance of their work.

Moreover, engaging with local stakeholders, such as health authorities and emergency services, can be challenging. Without strong collaboration and

communication, CFR programs may struggle to integrate effectively into the larger EMS framework (Jay et al., 2024). This disconnect can hinder the development of cohesive emergency response strategies and limit the resources available to CFRs.

5.4. Resource Limitations

Resource limitations are a significant challenge for many CFR programs. Volunteers often operate with minimal funding, which affects their access to essential equipment and training materials (Hird & Richardson, 2023). For instance, many CFRs rely on outdated or insufficient technology for communication and navigation, which can delay their response times and compromise patient care.

Additionally, a lack of financial support can lead to challenges in recruitment and retention of volunteers. Many CFRs are motivated by a desire to serve their communities, but without adequate resources and support, their ability to perform effectively may be compromised (Moussally et al., 2021). This situation can lead to burnout among volunteers who feel overwhelmed by the demands of their role without sufficient backing from local organizations or government entities (Campbell & Ellington, 2016). Community first responders play a vital role in emergency medical services, but they face numerous challenges that can impact their effectiveness. Training and skill gaps, legal and ethical considerations, difficulties in community engagement, and resource limitations all pose significant hurdles. Addressing these challenges requires a concerted effort from local authorities, healthcare organizations, and the communities they serve. By improving training programs, clarifying legal frameworks, fostering community support, and providing adequate resources, we can enhance the effectiveness of CFRs and ultimately improve patient outcomes in emergency situations.

6. DISCUSSION:

6.1. Summary of Key Findings

The literature review highlights the critical role of Community First Responders (CFRs) in enhancing prehospital trauma care, particularly in resource-limited settings. Key findings indicate that CFRs can significantly reduce response times and improve patient outcomes in emergencies, as evidenced by studies in Bangladesh and Uganda, where local initiatives effectively addressed traffic injuries and trauma cases (Moussally et al., 2021; Jayaraman et al., 2009). Additionally, training programs tailored to local contexts, such as those developed in Sierra Leone and Bolivia, have shown substantial improvements in knowledge and skills among lay responders (Eisner et

al., 2020; Boeck et al., 2017). The psychological resilience of CFRs, which allows them to manage stress and perform under pressure, emerged as another vital theme, underscoring the need for supportive frameworks to enhance their effectiveness (Davies et al., 2008; Phung et al., 2018).

6.2. Implications for Policy and Practice

The findings suggest several implications for policy and practice. Firstly, there is a pressing need for standardized training programs that ensure consistency and quality across CFR initiatives. Policymakers should consider adopting frameworks similar to those in high-performing programs like the TraumaLink in Bangladesh, which demonstrated effective community engagement and rapid response capabilities (Moussally et al., 2021). Additionally, integrating CFRs into formal emergency medical systems can enhance overall healthcare delivery, as seen in studies that highlighted successful collaboration between CFRs and traditional EMS (Hird & Richardson, 2023). Furthermore, mental health support systems should be established to address the unique psychological challenges faced by CFRs, ensuring their well-being and sustained engagement in community service (Lewis-Schroeder et al., 2018).

Areas for Future Research

Future research should focus on several areas to further understand and enhance the role of CFRs in trauma care. Longitudinal studies are needed to assess the long-term impacts of CFR training on patient outcomes and responder retention, particularly in regions with varying infrastructural challenges. Additionally, exploring the psychological effects of trauma exposure on CFRs, as discussed in the studies by Davies et al. (2008) and Phung et al. (2018), can inform tailored mental health interventions. Lastly, investigating the scalability of successful CFR models in different cultural contexts could provide valuable insights for implementing effective emergency response systems in low- and middle-income countries (Moussally et al., 2024).

7. CONCLUSION

7.1. Recap of the Importance of CFRs

Community First Responders (CFRs) play a vital role in the landscape of prehospital trauma care, particularly in areas where traditional emergency services may be limited or delayed. The evidence gathered from various studies illustrates that CFRs can significantly improve response times and patient outcomes in emergencies, especially in rural and underserved regions. Their ability to provide immediate care before professional medical assistance

arrives is crucial, as highlighted by successful CFR programs in countries like Bangladesh and Uganda (Moussally et al., 2021; Jayaraman et al., 2009). Additionally, the training and empowerment of laypersons as CFRs not only enhance community resilience but also foster a sense of ownership over local health initiatives.

7.2. Final Thoughts on Enhancing Prehospital Trauma Care

To enhance prehospital trauma care, it is essential to recognize and support the contributions of CFRs within broader emergency medical systems. Standardizing training and integrating CFRs with traditional EMS can optimize the effectiveness of emergency responses. Furthermore, addressing the psychological needs of CFRs through support programs will ensure their sustained engagement and performance. As communities continue to face the challenges posed by traffic injuries and other trauma-related incidents, leveraging the strengths of CFRs will be crucial in building robust and responsive healthcare systems. Future efforts should focus on research and policy initiatives that promote the sustainability and scalability of successful CFR models, ultimately improving health outcomes in diverse contexts.

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