

Original Research Article

Surgeon perspectives on musculoskeletal injury and trauma system gaps in The Gambia: a qualitative analysis

Abdoulie Njai^{1*}, Abdoulie Secka², Kebba Marenah², Sheryne Zietoun³, James L. Cook², Jessica Pelletier⁴, Trever Simon¹, Kiran A. Harding⁵, Lisa A. Royse¹

¹Department of Orthopaedic Surgery, University of Missouri, Columbia, Missouri, USA

²Department of Surgery, Edward Francis Small Teaching Hospital, Banjul, The Gambia

³Yale University School of Medicine, New Haven, Connecticut, USA

⁴Department of Emergency Medicine, University of Missouri, Columbia, Missouri, USA

⁵Harvard Global Orthopaedics Collaborative, Boston, Massachusetts, USA

Received: 06 March 2026

Revised: 30 July 2026

Accepted: 21 August 2026

*Correspondence:

Dr. Abdoulie Njai,

E-mail: aonggb@umsystem.edu

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: In The Gambia, Edward Francis Small Teaching Hospital (EFSTH) is unique in being the only tertiary hospital with a dedicated orthopaedic and trauma department, providing critical insights into the challenges of delivering trauma and orthopaedic care in the country. This qualitative study explored surgeon perspectives on musculoskeletal injury and barriers to trauma care delivery in The Gambia using the socioecological model.

Methods: The study was conducted in January 2025 at EFSTH. Structured interviews were conducted, audio-recorded, and transcribed verbatim. Data were analyzed using inductive and deductive thematic analysis by two independent reviewers.

Results: Five EFSTH surgeons participated in the study, representing multiple surgical specialties involved in musculoskeletal trauma, including orthopaedic surgery (n=2), urology (n=1), general surgery (n=1), and neurosurgery (n=1). Barriers to trauma and orthopaedic care were identified across socioecological levels. At the individual level, gaps in trauma and emergency training were noted. Interpersonal and community-level barriers included limited prehospital care and the absence of trained first responders. Institutional barriers involved weak referral pathways, poor inter-facility communication, and inadequate infrastructure, particularly in rural settings. At the policy level, participants highlighted misalignment between national priorities, funding, and implementation mechanisms.

Conclusions: This study demonstrates that the burden of musculoskeletal injury in The Gambia is driven not only by injury mechanisms but by interconnected barriers spanning individual knowledge, interpersonal connections, community norms, institutional capacity, and national policy. Addressing these challenges will require deliberate investment in trauma systems, workforce development, and injury prevention strategies grounded in the Gambian context.

Keywords: Capacity building, Sustainable development, Orthopaedic trauma, Trauma systems

INTRODUCTION

Musculoskeletal injury and trauma are major contributors to global morbidity, mortality, and disability, disproportionately affecting low- and middle-income countries (LMICs) where more than 90% of the world's

injury-related deaths occur.^{1,2} Rapid urbanizations, increasing motorization, and limited trauma system capacity are major drivers of these disproportionate outcomes. Sub-Saharan Africa experiences one of the highest trauma burdens, reflecting persistent gaps across the trauma care continuum.³⁻⁷

The Gambia, the smallest country on mainland Africa, exemplifies these LMIC and regional disparity patterns. Trauma represents one of the leading causes of emergency department presentations and surgical admissions across the country, commonly resulting from road traffic injuries and falls, amongst other causes.⁸ With a population of approximately 2.7 million people and a highly centralized health system, trauma care capacity in The Gambia is limited and concentrated within a small number of facilities.⁹ Edward Francis Small Teaching Hospital (EFSTH) and Serrekunda General Hospital (SGH) are the country's primary tertiary referral hospitals for managing patients with complex trauma, with EFSTH being unique in having a dedicated orthopaedic and trauma department and its functions as the national referral center for musculoskeletal injuries.⁹⁻¹¹ Therefore, EFSTH provides an essential vantage point for examining trauma system challenges.

Although quantitative assessments of trauma burden and surgical capacity are essential, they are insufficient to fully capture the contextual, operational, and policy-level barriers that shape trauma care delivery in these settings. Qualitative research, especially that involving frontline healthcare providers, offers valuable insight into health system gaps in practice across multiple levels of trauma care delivery.¹²⁻¹⁴ Furthermore, this approach captures surgeon perspectives in settings where specialists routinely navigate resource limitations, referral delays, and infrastructural constraints.^{15,16}

To date, there has been limited qualitative work exploring surgeon-identified barriers to musculoskeletal trauma care in The Gambia.¹⁷ Addressing this gap is essential for informing locally grounded trauma system-strengthening efforts. Therefore, this study aims to explore surgeons' perspectives on gaps in the musculoskeletal injury and trauma system in The Gambia, using a socioecological framework to characterize barriers across individual, interpersonal, community, institutional, and policy levels.

METHODS

All participants provided informed consent prior to data collection. Participation was voluntary, and surgeons were assured of confidentiality and the right to withdraw at any time.

Study design

A qualitative approach was used to explore surgeon perspectives on the causes of musculoskeletal injuries and the barriers to providing trauma care in The Gambia.

The socioecological model (SEM) was used as the guiding analytical framework to examine how individual, interpersonal, community, institutional, and policy-level factors intersect to shape musculoskeletal and trauma care delivery (Figure 1).^{18,19}

Study setting

The study was conducted in January 2025 at EFSTH in Banjul, The Gambia. EFSTH is the only hospital in the country with a dedicated orthopaedic and trauma unit and it manages a substantial proportion of The Gambia's complex trauma cases, receiving referrals from district hospitals, private clinics, and rural health centers.²⁰ This setting provided a unique insight into the barriers towards delivering trauma and musculoskeletal care nationwide.

Participant recruitment and sampling

Surgeons were recruited purposively to capture diverse perspectives from their practice at EFSTH involving trauma and orthopaedic care. Participant criteria included surgeons currently or recently practicing at EFSTH with direct involvement in musculoskeletal trauma care, representing relevant surgical specialties. Exclusion criteria included surgeons without trauma or orthopaedic involvement, and those not practicing at EFSTH during the study period. Snowball sampling was used to reach additional surgeons with relevant expertise. The sample size was determined by the total number of surgeons who met the inclusion criteria at EFSTH. Because only a small number of surgeons practice at this site, all eligible individuals were invited and interviewed. As such, sampling was driven by complete inclusion of the eligible population rather than by the pursuit of thematic saturation.

Data collection

Data were collected through structured interviews conducted in private rooms within EFSTH to ensure confidentiality. Each interview lasted approximately 15 to 30 minutes. An interview guide was developed using existing literature on orthopaedic and trauma systems in LMICs and the SEM domains. All interviews were conducted in English by a single interviewer, a trained qualitative researcher with no prior relationship with the surgeons. Interviews were audio-recorded using Apple iPhone voice memo and transcribed verbatim with Rev.com.²¹ Transcripts were shared with participants for their input, allowing them to add any additional reflections before analysis. Field notes were taken to supplement the transcripts and capture relevant contextual observations.

Data analysis

Data were analyzed using thematic analysis. Two reviewers independently reviewed the transcripts and conducted inductive coding to develop an initial set of codes grounded in the data. Following this inductive coding process, codes and emergent themes were organized into domains of the SEM to support interpretation across individual, interpersonal, organizational, community, and policy levels. Coding was conducted using QDA miner, which facilitated the systematic organization and comparison of emerging

patterns.²² Coding conflicts were resolved through discussion between the reviewers whenever discrepancies were identified.

Theory

Trauma and surgical outcomes are shaped by health system factors such as resource availability, workforce capacity, and coordination across levels of care. In LMICs, patients with musculoskeletal injuries often encounter multiple barriers along the care pathway, including limited prehospital services, delayed referrals, inadequate diagnostic resources, provider shortages, and misalignment between policy priorities and clinical needs.¹⁻³ Because these constraints are interconnected, failures at one point in the system can exacerbate delays and deficiencies elsewhere, contributing to preventable morbidity and mortality. Therefore, understanding trauma care in these settings requires a systems-based perspective that captures how barriers interact across levels of care rather than treating them as discrete challenges.

The SEM provides a useful framework for examining these interconnected factors. Originally developed to describe how different environmental contexts shape individual development, it has been widely adapted in public health to conceptualize the interaction of factors operating at individual, interpersonal, organizational, community, and policy levels. In the context of this study, the individual level includes personal knowledge, skills, and beliefs. The interpersonal level reflects the influence of family, peers, and professional relationships. The organizational level captures health facility capacity, including workforce, infrastructure, equipment, and clinical processes. The community level encompasses social norms, transportation, informal care systems, and inter-facility relationships. The policy level includes national laws, financing, and workforce policies that shape access, resources, and system sustainability.^{23,24} The SEM has been used to explain why isolated interventions often fail to produce sustained improvements in limited-resource settings.^{25,26} Applied to trauma and orthopaedic care, this framework enables a structured assessment of barriers across the continuum of care. By organizing surgeons' perspectives within this framework, our study aims to clarify how barriers to trauma care in The Gambia's centralized, resource-limited health system is interconnected across multiple levels and to identify leverage points for capacity building and trauma system strengthening grounded in local clinical contexts.

RESULTS

Five surgeons from EFSTH participated in the study, representing multiple surgical specialties, including orthopaedic surgery (n=2), urology (n=1), general surgery (n=1), and neurosurgery (n=1). Four participants were fellowship-trained attending surgeons, while one participant was an orthopaedic surgery resident. All participants were male and Gambian nationals (Table 1).

Individual level

Clinician-related factors

Gaps in trauma knowledge and skills

Healthcare providers in rural and district settings often lack specialized trauma training, limiting effective emergency and operative care. Surgeons emphasized the need for systematic training in basic trauma management and emergency life support for frontline clinicians. Continuing trauma education remains concentrated at tertiary centers such as EFSTH, leaving providers at peripheral facilities with limited exposure. Although the healthcare workforce is expanding, training remains largely generalized with minimal emphasis on trauma or orthopaedic specialization (Table 2).

Public-related factors

Low literacy and road safety awareness

Low road safety literacy among the general population poses a significant challenge to public education on road safety. Many individuals are unable to interpret road signs or understand written safety information. Consequently, even when traffic signs are installed, their purpose is often misunderstood. Respondents noted that licensing processes fail to adequately assess drivers' ability to identify and interpret signs, leading to unsafe driving practices on the roads. There is also a broader deficiency in civic education that leaves little acknowledgement of traffic laws and community responsibility, contributing to persistent patterns of unsafe road behavior (Table 2).

Limited health knowledge and reliance on traditional bone setters

Limited health literacy and poor understanding of when hospital care is needed contribute to delayed presentation and reliance on traditional bone setting, particularly in rural communities where it is familiar, low-cost, and perceived as effective. Inadequate awareness of injury prevention, safe fracture management, and the risks of unregulated bone setting—such as infection, malunion, and long-term disability—perpetuates continued use of these practices (Table 2).

Interpersonal level

Dependence on untrained first responders

Pre-hospital care is limited in The Gambia. There is no reliable ambulance service, no trained paramedics, and no centralized emergency number. Taxi drivers, police officers, and bystanders are often the first at an accident scene. Interviewees suggested that targeted training programs for these groups in basic trauma response could have a significant impact. However, the absence of national frameworks, funding, and infrastructure for such

training has prevented meaningful implementation (Table 2).

Lack of coordination across levels of the health system

Coordination between facilities is limited, resulting in fragmented care for trauma patients. Rural and district hospitals often lack the capacity and training to stabilize injuries before referral, leading to avoidable transfers and delays. Weak communication channels and the absence of standardized referral protocols further hinder smooth transitions across levels of care, contributing to inconsistent management and prolonged time to definitive treatment (Table 2).

Organizational/institutional level

Critical workforce shortages

A consistently emphasized barrier is the shortage of trained personnel to meet the country's trauma care needs. The entire country relies on only three orthopedic surgeons and very few neurosurgeons for a population of 2.7 million. The shortage of physiotherapists, paramedics, and other allied health professionals places an additional burden on the few specialists available. This results in overwhelming caseloads that are "almost impossible" to manage (Table 2).

Strained capacity

Surgeons noted that only one national hospital manages the entire orthopedic surgical workload; with just a handful of surgeons, and just two operating theaters available most days, the system is stretched far beyond capacity with the high volume of patients (Table 2).

Inadequate infrastructure and unreliable supply chains

Surgeons described persistent gaps in diagnostic capacity, treatment infrastructure, and supply chain reliability that limit effective trauma care. Many facilities lack essential diagnostic tools, such as functional X-ray machines and adequate radiology services, which require clinicians to rely heavily on clinical judgment and contribute to delays in definitive care. These infrastructural deficiencies are compounded by the inconsistent availability of surgical supplies and implants. Essential materials often depend on external donations or patient out-of-pocket purchases, creating inequities in access and interrupting care delivery (Table 2).

Absence of formal prehospital and paramedic systems

The absence of formal prehospital care systems, trained paramedics, and adequately equipped ambulance services emerged as a major barrier to effective trauma care. Surgeons emphasized the need for investment in structured emergency response systems that enable timely scene assessment, stabilization, triage, and transport, rather than

reliance on informal or improvised transport methods, to improve outcomes for trauma patients (Table 2).

Community level

Cultural use of traditional bone setting

Traditional bone setting remains a deeply rooted cultural practice in The Gambia and continues to serve as a primary source of fracture management for many communities, particularly in rural areas. The persistence of traditional bone setting reflects gaps in public health education, access to formal healthcare, and trust in the medical system (Table 2).

Lack of traffic rules and enforcement

Surgeons noted that although The Gambia has strong road safety policies, they are rarely enforced, limiting their effectiveness in reducing road traffic injuries. Weak traffic control, inadequate licensing practices, and a lack of penalties for violations, such as drunk driving during festive periods, were viewed as major contributors to preventable crashes. Participants emphasized that improving road safety requires stronger enforcement and coordinated action across sectors. Participants also stressed the need for broader community engagement, including drivers, media, and public education campaigns, to promote safe driving and increase awareness of how adherence to traffic rules can save lives (Table 2).

Limited public safety education and health promotion

Surgeons emphasized that inadequate public safety messaging and weak health promotion efforts contribute significantly to preventable injuries. Although resources such as emergency helplines exist, low public awareness leaves many unsure of their availability or use. Similarly, despite the presence of road safety initiatives, respondents felt their impact is limited by insufficient civic education and poor adherence to traffic rules. Participants stressed the need for stronger, more visible public education campaigns to promote safe driving, proper traffic behavior, and awareness of emergency services, noting that coordinated, multidisciplinary efforts involving drivers, police, healthcare providers, and media are essential to reducing road traffic injuries and the overall trauma burden (Table 2).

Policy/system level

Inadequate national funding, policies, and systems

Despite recognition of the need for organized trauma systems, policy development and execution have remained stagnant. Constraints in leadership coordination, resource allocation, and strategic oversight have limited the effective translation of policy intent into sustainable system-level improvements. Healthcare leaders have reported limited opportunities for feedback or

collaboration with the Ministry of Health. There are calls for investment in comprehensive trauma centers with proper labs, radiology, and pre-hospital systems, including well-equipped ambulances. Longstanding underinvestment in surgical and trauma care infrastructure continues to impede service delivery in The Gambia. Inadequate funding mechanisms and competing national health priorities further deprioritize surgical and trauma services, exacerbating disparities in access and contributing to suboptimal outcomes (Table 2).

Inadequate government strategies for workforce development

Weak policies around trauma systems and workforce development delay progress in building sustainable human resources (Table 2).

Limited national investment in health promotion and injury prevention

Health promotion efforts in The Gambia remain sporadic, underfunded, and limited in reach, reducing their impact on public awareness of injury prevention, road safety, traditional bone-setting risks, and timely healthcare-seeking behaviors. Surgeons noted that simple, low-cost

interventions such as regular radio or television campaigns could significantly improve prevention if consistently supported, but such initiatives are rarely sustained. The absence of structured educational programs in schools and communities further limits the dissemination of safety and prevention messages, contributing to preventable injuries and delays in seeking appropriate surgical care (Table 2).

Table 1: Characteristics of surgeon participants.

Characteristic	Description
Total participants	5
Institution	EFSTH
Sex	Male (100%)
Nationality	Gambian (100%)
Training level	Fellowship-trained surgeons (n=4); resident orthopaedic surgeon (n=1)
Years in practice	>5 years for attending surgeons
Orthopaedic Surgery	2
Urology	1
General surgery	1
Neuro surgery	1

EFSTH=Edward Francis Small Teaching Hospital

Table 2: Barriers to orthopaedic trauma system development in The Gambia organized by the social ecological model.

SEM level	Theme	Summary of findings	Representative quote(s)
Individual (clinician)	Gaps in trauma knowledge and skills	Rural clinicians often lack formal trauma training, and continuing education is largely concentrated at tertiary hospitals.	"We don't have enough healthcare providers, and when you do have healthcare providers, there often is not enough training in trauma care for them to apply that effectively on the ground." "This must be an ongoing process because trauma care is not a large part of the curriculum."
	Low literacy and road safety awareness	Limited literacy and poor understanding of road safety contribute to unsafe driving practices and difficulty implementing traffic regulations.	"Most of these drivers are not literate, so even if you put signs, they don't know the meaning."
Individual (public)	Limited health knowledge and reliance on traditional bone setters	Poor health literacy delays hospital presentation and reinforces dependence on traditional fracture care.	"The health-seeking behavior of most here tends to delay hospital care." "Many just believe more in the traditional approach because it's close by and accessible."
	Dependence on untrained first responders	Without organized EMS, police, taxi drivers, and bystanders transport injured patients with little or no trauma training.	"There's no number you can call if you see an accident." "Those with spine injuries are often pulled out of vehicles and taken straight to the hospital."
Interpersonal	Poor coordination across the health system	Fragmented referral pathways and weak communication between facilities contribute to delays in definitive care.	"You have to get sent to a district hospital before they send you to a tertiary trauma center."

Continued.

SEM level	Theme	Summary of findings	Representative quote(s)
Organizational/ institutional	Critical workforce shortages	Severe shortages of orthopaedic surgeons, neurosurgeons, physiotherapists, and allied health personnel overwhelm the health system.	"We have three surgeons currently in country. It's an almost impossible task."
	Strained surgical capacity	A single national trauma center with limited operating theatres manages nearly the country's entire trauma burden.	"We have two theaters... and this hospital is supposed to manage the whole capacity for the whole country."
	Inadequate infrastructure and unreliable supply chains	Limited diagnostic equipment, inconsistent implant availability, and shortages of basic supplies restrict trauma care.	"Sometimes even sterile gloves may not be available."
	Absence of formal prehospital and paramedic systems	There are no structured ambulance services or trained paramedics capable of providing prehospital stabilization.	"We don't have an ambulance service, we don't have paramedics."
Community	Cultural use of traditional bone setting	Traditional bone setters remain widely used because of accessibility, affordability, and longstanding cultural trust.	"The first protocol for many is going to a traditional healer."
	Weak traffic rule enforcement	Existing road safety legislation is poorly enforced, contributing to preventable road traffic injuries.	"We have a lot of good things on paper, but nothing in practice."
	Limited public safety education	Public awareness campaigns regarding injury prevention and emergency services are insufficient and inconsistent.	"It requires the collaboration of everybody... to educate people about proper traffic rules."
Policy/ system	Inadequate national funding and trauma policy implementation	Trauma system development is limited by insufficient funding, competing priorities, and poor coordination between policymakers and healthcare institutions.	"There are competing priorities, and health may not always figure on top." "There is a disconnect between what happens at the Ministry of Health and what happens at the institution level."
	Limited workforce development policies	National strategies to develop trauma specialists and strengthen the workforce remain insufficient.	"The policies need to be improved so that trauma systems can be developed."
	Limited investment in health promotion	Injury prevention and public education initiatives are underfunded and inconsistently implemented.	"The impact is not felt much-probably the reach isn't there, and sometimes funding is an issue."

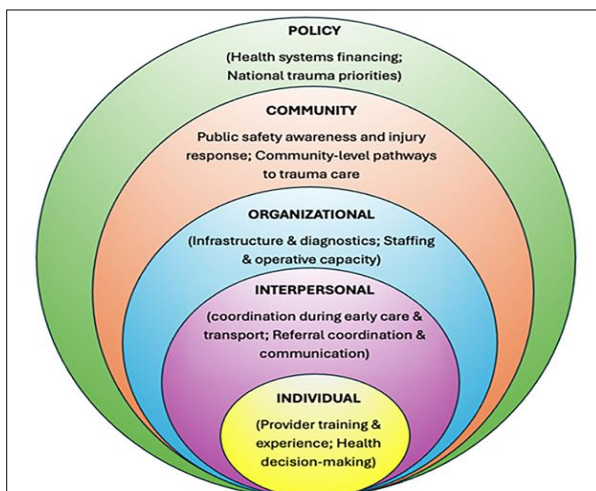


Figure 1: Social ecological model applied to trauma and orthopaedic care.

DISCUSSION

Using an SEM analytic framework, the findings from this qualitative study of Gambian surgeons' insights into barriers to trauma and orthopaedic care delivery highlight the importance of intersecting individual, interpersonal, community, institutional, and policy-level factors. Collectively, these findings underscore the urgent need for coordinated trauma system strengthening in The Gambia.

Trauma care as an interconnected system

Surgeon perspectives consistently emphasized the interconnectedness of weaknesses in hospital response, referral pathways, facility capacity, and policy implementation. Limited public awareness and first-responder capacity at the individual and interpersonal levels intersect with the absence of formal prehospital systems at the organizational level, weak referral

coordination at the community level, and persistent challenges in resource allocation and policy coordination at the national level. These multilevel barriers mirror findings from a holistic health system assessment in Malawi, which used nine integrated methods to identify cost, transport, and physical resources as the most important barriers driving delays to seeking, reaching, and receiving injury care, respectively.²⁷ A Delphi study among LMIC health system and injury care experts noted patients frequently experience delayed presentation, unsafe transport, and prolonged time to definitive care, even when surgical expertise is available.²⁸ These patterns highlight the need for coordinated interventions that address multiple levels simultaneously rather than isolated investments.

Opportunities for trauma system strengthening

Improving access to trauma training

Surgeons described improving trauma care training as a vital strategy for addressing barriers across multiple socioecological levels. Integrating basic trauma and emergency response training into medical and nursing school curricula can strengthen individual clinician knowledge and skills while improving early stabilization at rural and district facilities. A meta-analysis of quality improvement interventions in LMIC trauma systems found that in-hospital trauma training with certified courses reduced mortality by 29%, while training first responders resulted in a 53% decrease in mortality.²⁹ Extending this training to informal first responders, such as police officers and taxi drivers, can enhance scene-level care and help reduce unsafe transport practices, while addressing interpersonal and community-level barriers and supporting organizational workforce constraints. A study in Kampala, Uganda demonstrated that lay first responders (police, taxi drivers, and community leaders) who completed a one-day basic prehospital trauma care program retained high knowledge at six months (mean correct score 92%) and 97% had used at least one skill from the course.³⁰

Strengthening prehospital and first-response systems

Given the absence of a formal emergency response system, surgeons identified opportunities to incrementally strengthen prehospital care. A scoping review of prehospital trauma care in LMICs identified four key barrier themes: deficits in provider training, inadequate infrastructure and communication systems, fragmented governance, and sociocultural obstacles while highlighting that the most effective facilitators centered on context-specific training, community-based first responder initiatives, and low-cost technology for communication and dispatch.³¹

Community first-responder programs that provide basic trauma training, first aid equipment, and formal triage assistance could improve scene-level care while reducing unsafe transport practices.^{32,33}

Referral pathways and inter-facility communication

Improving referral pathways represents another intervention that operates across several SEM levels. A scoping review of surgical referral systems in LMICs found that comprehensive protocols for surgical referrals are lacking in most settings, and that established patient pathways, when in place, are not correctly followed; the review concluded that interventions to improve coordination and communication between different-level facilities may enhance efficiency of referral pathways.³⁴ A multi-disciplinary study in Rwanda identified "lack of protocol for bypass to referral centres" and "geographical coverage of referral trauma centres" among the highest-priority barriers to injury care.³⁵ At the organizational and community levels, low-cost digital communication platforms such as call-ahead systems or messaging groups linking district and tertiary hospitals may reduce unnecessary transfers and improve preparedness for incoming trauma patients. Strengthening the capacity of referring hospitals to manage more surgical conditions locally could also improve outcomes, decrease the need for referral, and reduce the burden on tertiary facilities.³⁴ When embedded within national referral frameworks, these strategies lead to policy-level coordination.

Community engagement, injury prevention, and health literacy

Surgeons emphasized that community engagement and injury prevention are critical to reducing trauma burden. A qualitative study across Ghana, South Africa, and Rwanda identified low health literacy and inadequate information provision as common barriers to accessing quality injury care, while improved health literacy and empathetic, responsive care were identified as key facilitators.³⁶ Public education campaigns addressing road safety, fall prevention, interpersonal violence, and the risks of delayed presentation can influence individual behaviors and address cultural norms. Engaging traditional bone setters as community partners within these educational efforts may offer an opportunity to improve early referral and reduce complications from delayed or inappropriate care. A systematic review found that traditional bone setting complications are associated with significant morbidity, yet traditional bonesetters have the potential to contribute positively to primary fracture care when trained.³⁷ A study in Ghana demonstrated that a 4-day training course for 157 traditional bonesetters produced an overall knowledge gain of 19.7% (from 67.2% to 86.9%), with improved practices in record-keeping, hand hygiene, and patient rehabilitation at 6 months, and 37 patients referred to local hospitals as a result of newly established referral pathways.³⁸ In Nigeria, both traditional bonesetters and orthopaedic surgeons recognized the feasibility and willingness for formal training and integration of bonesetters into the healthcare system.³⁹ When delivered through trusted channels such as radio, television, schools, and religious leaders, and aligned with national road safety

strategies—these efforts can reinforce policy-level initiatives while remaining culturally appropriate.

Policy alignment and sustainable system growth

At the policy level, this study highlights a persistent gap between perceived national plans and implementation. It has been estimated that 2 million lives could be saved through the implementation of modern trauma systems in LMICs.⁴⁰ Phased investments such as piloting prehospital programs, protecting funding for trauma care, and integrating trauma indicators into national health information systems could improve coordination, accountability, and system performance. Rwanda's experience offers a useful model: a multi-disciplinary collaboration standardized prehospital care delivery through context-appropriate short courses, implemented 42 protocols and checklists, and instituted the WHO Trauma Registry across four major referral centers, all embedded within the Ministry of Health's sector wide approaches to planning process.⁴¹ Importantly, sustained involvement of frontline surgeons and clinicians in policy design and evaluation ensures that strategies remain grounded in operational realities, enhancing feasibility and long-term impact.

Limitations

The primary limitation in this study is its sample size. It is a small sample and limited to surgeons only practicing at a single tertiary institution, which may not capture perspectives from other healthcare workers or patients. However, given the limited number of surgeons nationally and the central role of EFSTH as the country's primary referral center for complex trauma, the perspectives captured provide critical insight into system-level challenges in trauma and orthopaedic care delivery. Future studies should incorporate perspectives from diverse healthcare team members, policymakers, and patients, and include quantitative assessments of trauma burden and outcomes to complement these findings.

CONCLUSION

This qualitative study demonstrates that surgeons perceive trauma and musculoskeletal injury care in The Gambia to be shaped by interconnected barriers operating across individual, interpersonal, organizational, community, and policy levels. These barriers reinforce one another, producing delays and deficiencies that begin at the scene of injury and persist through definitive care, contributing to preventable morbidity and mortality. Surgeons identified pragmatic, multi-level opportunities for improvement, including task-sharing trauma training, community-engaged injury prevention and health literacy efforts, and integration of informal first responders into basic trauma response systems. Together, these findings underscore the need for coordinated, contextually grounded interventions that span levels of care and offer

actionable pathways for strengthening trauma systems in The Gambia and similar settings.

ACKNOWLEDGEMENTS

Authors would like to thank the Edward Francis Small Teaching Hospital, The Harvard Global Orthopaedics Collaborative, and the University of Missouri Department of Orthopaedic Surgery for their support in conducting this project.

Funding: The study was funded by JRGOS Zimmer Biomet Research Grant, grant number: 00085395, The Barry J. Gainor Resident Research and Scholarship Endowment Fund, and the University of Missouri Orthopaedic Association Research Fund

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Soni KD, Bansal V, Arora H, Verma S, Wärnberg MG, Roy N. The state of global trauma and acute care surgery/surgical critical care. *Crit Care Clin.* 2022;38(4):695-706.
2. DeMaio EL, Marra G, Suleiman LI, Tjong VK. Global health inequities in orthopaedic care: perspectives beyond the US. *Curr Rev Musculoskelet Med.* 2024;17(11):439-48.
3. Graham SM, Chokotho L, Mkandawire N, Laubscher M, Maqungo S, Haonga B, et al. Injury: a neglected global health challenge in low-income and middle-income countries. *Lancet Glob Health.* 2025;13(4):e613-5.
4. Miclau T, Hoogervorst P, Shearer DW, El Naga AN, Working ZM, Martin C, et al. Current status of musculoskeletal trauma care systems worldwide. *J Orthop Trauma.* 2018;32(7):S64-70.
5. Pouramin P, Li CS, Busse JW, Sprague S, Devereaux PJ, Jagnor J, et al. Delays in hospital admissions in patients with fractures across 18 low-income and middle-income countries (INORMUS): a prospective observational study. *Lancet Glob Health.* 2020;8(5):e711-20.
6. Widiyawati K, Lestari R, Suryanto. Emergency response in resource-constrained settings: A scoping review of prehospital trauma care in LMICs. *Am J Emerg Med.* 2025;97:220-6.
7. Edmiston T, Bath MF, Ratnayake A, Reyes LF, Reffin E, Zhang Z, et al. What is the need for and access to trauma surgery in low- and middle-income countries? a scoping review. *World J Surg.* 2025;49(7):1928-40.
8. Sanyang E, Peek-Asa C, Bass P, Young TL, Jagne A, Njie B. Injury factors associated with discharge status from emergency room at two major trauma hospitals in The Gambia, Africa. *Injury.* 2017;48(7):1451-8.

9. Singh U, Jindal J. Comprehensive overview of The Gambia's health landscape. *Universal Res Rep.* 2023;10(3):111-23.
10. Touray S, Sanyang B, Zandrow G, Dibba F, Fadera K, Kanteh E, et al. An assessment of critical care capacity in The Gambia. *J Crit Care.* 2018;47:245-53.
11. Gambia Bureau of Statistics (GBoS) and ICF. 2021. The Gambia Demographic and Health Survey 2019-20. Banjul, The Gambia and Rockville, Maryland, USA: GBoS and ICF. Available at: <https://dhsprogram.com/publications/publication-FR369-DHS-Final-Reports.cfm>. Accessed on 15 May 2026.
12. Bakhshaie J, Fishbein NS, Woodworth E, Liyanage N, Penn T, Elwy AR, et al. Health disparities in orthopedic trauma: a qualitative study examining providers' perspectives on barriers to care and recovery outcomes. *Soc Work Health Care.* 2023;62(6-7):207-27.
13. Kennedy C, Ignatowicz A, Odland ML, Abdul-Latif AM, Belli A, Howard A, et al. Commonalities and differences in injured patient experiences of accessing and receiving quality injury care: a qualitative study in three sub-Saharan African countries. *BMJ Open.* 2024;14(7):e082098.
14. Whitaker J, Nepogodiev D, Leather A, Davies J. Assessing barriers to quality trauma care in low and middle-income countries: A Delphi study. *Injury.* 2020;51(2):278-85.
15. Virk A, Bella Jalloh M, Koedoyoma S, Smalle IO, Bolton W, Scott JA, et al. What factors shape surgical access in West Africa? A qualitative study exploring patient and provider experiences of managing injuries in Sierra Leone. *BMJ Open.* 2021;11(3):e042402.
16. Wilson S, Bah MM, George P, Caulker A, Holmer H, Leather AJ, et al. Challenges and solutions to providing surgery in Sierra Leone hospitals: a qualitative analysis of surgical provider perspectives. *BMJ Open.* 2022;12(2):e052972.
17. Njai A, Nak Y, Kah M, Joof M, Secka A, Royse LA, et al. Understanding barriers to orthopaedic and trauma care delivery in The Gambia utilizing the social ecological model: a scoping review. *J Glob Surg (ONE).* 2025;1(2):172-86.
18. Kilanowski JF. Breadth of the socio-ecological model. *J Agromedicine.* 2017;22(4):295-7.
19. Bronfenbrenner U. Ecological systems theory. In: Vasta R, editor. *Annals of Child Development: Vol 6.* London, UK. Jessica Kingsley Publishers; 1989:187-249.
20. AO Alliance. Profile: The Gambia Country Initiative and Dr Kebba Marenah. AO Alliance. Available at: <https://ao-alliance.org/profile-the-gambia-country-initiative-and-dr-kebba-marenah/>. Accessed on 15 May 2026.
21. Rev.com. Rev transcription services. Available at: <https://www.rev.com/transcription>. Accessed on 15 May 2026.
22. Provalis Research. QDA Miner qualitative data analysis software [computer program]. Montreal, QC: Provalis Research. 2024. Available at: <https://provalisresearch.com/products/qualitative-data-analysis-software/>. Accessed on 15 May 2026.
23. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q.* 1988;15(4):351-77.
24. Golden SD, Earp JA. Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Educ Behav.* 2012;39(3):364-72.
25. Zulkipli SH, Rosliza AM. Application of socio-ecological model in developing preventive strategies against suicidal ideation and suicidal attempt among youth in low and middle-income countries: A scoping review. *Med J Malaysia.* 2022;77(6):755-63.
26. Bamuya C, Correia JC, Brady EM, Beran D, Harrington D, Damasceno A, et al. Use of the socio-ecological model to explore factors that influence the implementation of a diabetes structured education programme (EXTEND project) in Lilongwe, Malawi and Maputo, Mozambique: a qualitative study. *BMC Public Health.* 2021;21(1):1355.
27. Whitaker J, Edem I, Togun E, Amoah AS, Dube A, Chirwa L, et al. Health system assessment for access to care after injury in low- or middle-income countries: A mixed methods study from Northern Malawi. *PLoS Med.* 2024;21(1):e1004344.
28. Whitaker J, Nepogodiev D, Leather A, Davies J. Assessing barriers to quality trauma care in low and middle-income countries: A Delphi study. *Injury.* 2020;51(2):278-85.
29. Jin J, Akau'ola S, Yip CH, Nthumba P, Ameh EA, de Jonge S, et al. Effectiveness of Quality Improvement Processes, Interventions, and Structure in Trauma Systems in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis. *World J Surg.* 2021;45(7):1982-98.
30. Jayaraman S, Mabweijano JR, Lipnick MS, Caldwell N, Miyamoto J, Wangoda R, et al. First things first: effectiveness and scalability of a basic prehospital trauma care program for lay first-responders in Kampala, Uganda. *PLoS One.* 2009;4(9):e6955.
31. Widiyawati K, Lestari R, Suryanto. Emergency response in resource-constrained settings: A scoping review of prehospital trauma care in LMICs. *Am J Emerg Med.* 2025;97:220-6.
32. Delaney PG, Eisner ZJ, Pine H, Klapow M, Thullah AH, Bamuleke R, et al. Leveraging transportation providers to deploy lay first responder (LFR) programs in three sub-Saharan African countries without formal emergency medical services: Evaluating longitudinal impact and cost-effectiveness. *Injury.* 2024;55(5):111505.
33. Moussally J, Mirza UJ, Delaney PG. Emergency medical services infrastructure development and operations in low- and middle-income countries: Community first responder-driven (Tier-1)

- emergency medical services systems. *Surgery.* 2024;176(4):1305-7.
34. Pittalis C, Brugha R, Gajewski J. Surgical referral systems in low- and middle-income countries: A review of the evidence. *PLoS One.* 2019;14(9):e0223328.
 35. Odland ML, Whitaker J, Nepogodiev D, Aling' CA, Bagahirwa I, Dushime T, et al. Identifying, Prioritizing and Visually Mapping Barriers to Injury Care in Rwanda: A Multi-disciplinary Stakeholder Exercise. *World J Surg.* 2020;44(9):2903-18.
 36. Kennedy C, Ignatowicz A, Odland ML, Abdul-Latif AM, Belli A, Howard A, et al. Commonalities and differences in injured patient experiences of accessing and receiving quality injury care: a qualitative study in three sub-Saharan African countries. *BMJ Open.* 2024;14(7):e082098.
 37. Onyemaechi NO, Menson WNA, Goodman X, Slinkard S, Onwujekwe OE, Enweani UN, et al. Complications of traditional bonesetting in contemporary fracture care in low- and middle-income countries: A systematic review. *Trop Med Int Health.* 2021;26(11):1367-77.
 38. Konadu-Yeboah D, Yempabe T, Bo-Ib Buunaaim AD, Konadu P, Owusu R, Arthur J, et al. Training Traditional Bonesetters in Basic Principles of Fracture Treatment: A Proof of Concept in Ghana. *J Bone Joint Surg Am.* 2023;105(24):1995-2001.
 39. Onyemaechi NO, Itanyi IU, Ossai PO, Ezeanolue EE. Can traditional bonesetters become trained technicians? Feasibility study among a cohort of Nigerian traditional bonesetters. *Hum Resour Health.* 2020;18(1):24.
 40. Razzak JA, Bhatti J, Wright K, Nyirenda M, Tahir MR, Hyder AA. Improvement in trauma care for road traffic injuries: an assessment of the effect on mortality in low-income and middle-income countries. *Lancet.* 2022;400(10348):329-36.
 41. Jayaraman S, Ntirenganya F, Nkeshimana M, Rosenberg A, Dushime T, Kabagema I, et al. Building Trauma and EMS Systems Capacity in Rwanda: Lessons and Recommendations. *Ann Glob Health.* 2021;87(1):104.

Cite this article as: Njai A, Secka A, Marenah K, Zietoun S, Cook JL, Pelletier J, et al. Surgeon perspectives on musculoskeletal injury and trauma system gaps in The Gambia: a qualitative analysis. *Int J Res Orthop* 2026;12:1264-73.