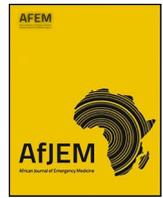


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## Experiences of injured patients referred to higher levels of care after initial assessment and management at non-tertiary hospitals in Ghana

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### ABSTRACT

**Background:** The experiences of trauma patients referred from Ghanaian non-tertiary hospitals for definitive care at higher levels is not well-known. Understanding the motivations of injured patients who do not attend their referral for definitive management may inform interventions to improve injury outcomes.

**Methods:** This study is a follow-up survey of participants of a larger study involving initial management of injured patients presenting to 8 non-tertiary hospitals in Ghana from October 2020 to March 2022. Injured patients referred to higher levels of care were surveyed by phone using a structured questionnaire and patients who could not be reached were excluded. The main outcome was referral non-attendance and differences between patients who attended the referral and those who did not were determined with chi squared tests. Variables with intergroup differences were included in a multivariable logistic regression. Open-ended survey responses were analyzed using thematic content analysis.

**Results:** Of 335 referred patients surveyed, 17 % did not attend the referral. Factors associated with referral non-attendance included being male (Adjusted odds ratio (AOR)=2.70,  $p = 0.013$ ), sustaining a fracture (AOR=2.83,  $p = 0.003$ ), and having less severe injury (AOR 2.84,  $p = 0.017$ ). Primary drivers of referral non-attendance included financial problems (59 %), family influence (45 %), and lack of transportation (20 %). The majority of patients (77 %) not attending the referral sought treatment from traditional healers, citing lower cost, faster service, and a perception of equivalent outcomes. Reported facilitators of referral attendance included positive hospital staff experiences and treatment while barriers included higher hospital costs, lack of bed space, and poor interhospital communication.

**Conclusions:** An important proportion of injured patients in Ghana do not attend referrals for definitive management, with many seeking care from traditional healers. Our study identified possible targets for interventions aimed at maintaining the continuum of hospital-based care for injured patients in order to improve outcomes.

### African relevance

- Traumatic injury continues to be a leading cause of death and disability in Sub-Saharan Africa with persistent barriers to timely referral for definitive management.
- Being male, sustaining a fracture, and having less severe injuries were most associated with referral non-attendance after traumatic injury in Ghana.

- Most Ghanaian patients who did not attend their referral sought treatment from traditional healers, reporting that it is cheaper, care is faster, and perceived outcomes are similar to hospital-based care.
- Targeted engagement of patients with fractures and public health guidelines to improve trauma care cost and delivery may improve the rate of referral attendance in the Ghanaian context.

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## Introduction

Traumatic injury continues to be a leading cause of death and disability, disproportionately affecting low- and middle-income countries (LMICs).<sup>1</sup> Referral systems connect smaller hospitals to higher levels of care according to patient needs and the level of clinical expertise required to meet those needs.<sup>2</sup> Within this framework, a well-functioning referral network is critical to balancing a health system's resource allocation with patient access to care. However, for many LMICs, limitations on the workforce, surgical facilities, and patient resources make access to appropriate higher levels of care for trauma patients difficult.<sup>3–6</sup> This raises the need to understand gaps within the referral system to inform strategies aimed at maintaining the continuum of hospital-based care for the injured.<sup>2</sup>

In Ghana, trauma care constitutes 15 % of the total annual surgical volume. However, this meets only 12 % of the estimated trauma surgical need.<sup>7</sup> While significant strides have been made in the availability of resuscitative equipment, trauma care training, and surgical capabilities, opportunities remain for improving timely access to definitive management.<sup>8</sup> Prior work has demonstrated persistent barriers to the referral process in Ghana due to gaps in patient insurance, staff shortages, transportation coverage, reliance upon traditional healers, and incomplete documentation.<sup>4,5,9</sup> Despite this evidence, the experiences of traumatically injured patients referred from non-tertiary hospitals for definitive care at higher levels remain poorly understood.

To address this gap, we conducted a survey-based content analysis of the experiences of patients referred to higher levels of care after initial management for their injury at non-tertiary hospitals. By so doing, we sought to evaluate the barriers and facilitators of successful referral and propose policy measures to improve patient access to trauma care.

## Methods

Ghana is a lower middle-income country with a population of 33 million.<sup>10</sup> Provision of trauma care occurs at district (first-level), regional (referral), and tertiary hospitals. District hospitals are staffed by nurses, general doctors, and/or physician assistants, and sometimes by specialists and provide basic trauma care. When necessary, patients are referred to regional hospitals, usually staffed by specialists (e.g., general and orthopedic surgeons) and tertiary hospitals, which usually offer advanced trauma care.<sup>7</sup> Transportation for referrals in Ghana mimics the pattern of prehospital transportation and is formally carried out by the National Ambulance Service (NAS).<sup>11</sup> Despite increases in capacity, NAS utilization of 0.3 responses per ambulance per day is low compared to 2–20 reported from other countries.<sup>12</sup> Insufficient funding to meet the needs of a growing population, leading to high out-of-pocket costs remains a major contributor to low NAS utilization rates. The majority of acute patient transports thus occurs via non-ambulance means including private vehicles and taxis.<sup>11</sup>

The Ghana Health Service has a defined referral pathway, allowing health workers to use their discretion when identifying an appropriate referral hospital. However, holistic referral guidelines at the national level in Ghana have not been achieved.<sup>13</sup>

## Participants

The current study is a follow-up from another study involving initial management of injured patients presenting to 8 non-tertiary hospitals in Ghana between October 2020 to March 2022. The methods and results of the original study have already been reported.<sup>14</sup> Briefly, injured patients were initially assessed and managed by emergency health service providers at the emergency units of these hospitals after which they were discharged, admitted, or referred. Injured patients who were referred to higher levels of care either directly from the emergency units or following a period of admission were included in the current study. Relevant patient demographic and clinical information were extracted

from the original study database. Variables included in the current study were age, sex, mechanism of injury, intent of injury (unintentional, assault, self-harm), injury type, consciousness level at ER arrival (on AVPU scale), length of stay, and injury severity score. At referral, the patient's name and contact number were recorded for the purpose of a follow up survey by telephone.

## Data collection and analysis

Patients were contacted by telephone 2 weeks after referral and surveyed, using a structured questionnaire, about attending the referral and their experiences at the referral hospital. Those who did not attend the referral were asked about how they managed their injury (Appendix). They were also asked about their reasons for not attending and multiple responses were accepted, including distance to referral hospital, transportation, and financial difficulties. Similarly, multiple responses were accepted for reasons why patients preferred treatment from traditional healers for their injury after being referred to a hospital. Patients who attended the referral were asked to describe their experiences at the referral hospital and any suggestions to improve upon their experiences. Referral transportation type and availability were not assessed for this study. For patients who could not be reached 2 weeks after referral, additional attempts were made the next week and the week after. Those who could not be reached one month after referral were deemed lost to follow-up. Identifiable patient information (e.g. patient names, telephone numbers) were removed from the database before analysis with Stata v17 (College Station, TX, USA).

All patients who could be reached consented to the survey and were included in analysis. Demographic data were presented as descriptive statistics. The main outcome was referral non-attendance and differences between patients who attended the referral and those who did not were determined with a chi squared test. Variables with differences between the 2 groups ( $p < 0.10$ ) were included in a multivariable logistic regression. There was no evidence of significant multicollinearity among the covariates in the model (mean variance inflation factor = 1.04). A content analysis framework was used to analyze responses to qualitative questions.<sup>15</sup> Similar responses were initially grouped into categories, which were then refined into useful themes and described.

## Ethics

The Committee for Human Research and Publication Ethics of Kwame Nkrumah University of Science and Technology approved the study (CHRPE/AP/274/22). Verbal consent was obtained from patients to be interviewed over the telephone.

## Results

### Demographics and clinical characteristics

Four hundred forty-five patients were referred after initial presentation to emergency units of the study hospitals. One hundred and ten patients were excluded due to loss to follow-up. Of the remaining 335, 279 (83 %) attended the referral; 56 (17 %) did not. The distribution of age, mechanism, and intent of injury was similar between the 2 groups. Types of injury were also similar between the 2 groups, with the exception of fractures, which were higher among patients who did not attend the referral (73% vs 57 %,  $p = 0.020$ ). Consciousness level on arrival and length of stay (LOS) were similar between the 2 groups, with most patients (>80 %) being alert on arrival and having a LOS <24 h. Patients who did not attend their referral were less severely injured (13% vs 25 %,  $p = 0.041$ ) (Table 1). Being male and having a fracture, and having a less severe injury were associated with increased odds referral non-attendance (Table 2).

Common reasons provided by patients who did not attend the referral included financial problems (59 %), the influence of family or

**Table 1**  
Characteristics of injured patients referred after initial management at emergency units of select Ghanaian district and regional hospitals (Total N = 335).

	Did not attend referral (N = 56)		Attended referral (N = 279)		p-value
	N	(%)	N	(%)	
<b>Sex</b>					
Male	47	(84)	197	(71)	0.041
Female	9	(16)	82	(29)	
<b>Age, Mean (Range), Years</b>	31	(12–83)	32	(1–82)	0.544
<b>Mechanism of injury</b>					
Blunt	54	(96)	251	(90)	0.275
Penetrating	2	(4)	23	(8)	
Burns	0	(0)	5	(2)	
<b>Intent</b>					
Unintentional	53	(95)	261	(94)	0.677
Assault	1	(2)	13	(5)	
Self-harm	0	(0)	1	(0)	
Unknown/Missing	2	(4)	4	(1)	
<b>Injury type</b>					
Laceration	20	(36)	129	(46)	0.164
Fracture	41	(73)	160	(57)	0.020
Bruise/ Superficial injury	6	(11)	30	(11)	0.986
Sprain/ Dislocation	3	(5)	13	(5)	0.810
Burns	0	(0)	4	(1)	0.370
Pneumothorax/ Hemothorax	0	(0)	3	(1)	0.438
Hemoperitoneum	1	(2)	4	(1)	0.835
Multiple injuries	16	(29)	89	(32)	0.599
<b>Consciousness level at ER arrival</b>					
Alert	46	(82)	231	(83)	0.233
Responds to verbal stimuli	2	(4)	4	(1)	
Responds to pain stimuli	1	(2)	6	(2)	
Unresponsive	0	(0)	15	(5)	
Missing	7	(13)	23	(8)	
<b>LOS &lt;24, hours</b>	45	(80)	225	(81)	0.960
<b>Injury Severity Score ≥9</b>	7	(13)	70	(25)	0.041

Chi-square tests excludes missing data. LOS, length of stay; ER, emergency room

**Table 2**  
Factors associated with non-attendance of referral after initial management of injury at emergency units of select Ghanaian district and regional hospitals.

Variable	Crude OR (95 % CI)	p-value	Adjusted OR (95 % CI)	p-value
<b>Sex</b>				
Female	Reference			
Male	2.17 (1.02 - 4.64)	0.045	2.70 (1.24 - 5.89)	0.013
<b>Severely injured*</b>				
Yes	Reference			
No	2.34 (1.02 - 5.41)	0.046	2.84 (1.20 - 6.71)	0.017
<b>Fracture</b>				
No	Reference			
Yes	2.14 (1.12 - 4.11)	0.022	2.83 (1.44 - 5.57)	0.003

\* Severely injured: Injury severity score ≥9.

friends (45 %), and difficult means of transport (20 %). The majority (77 %) of patients who did not attend the referral went for treatment from traditional healers, most commonly because of the lower cost (79 %) and provision of quicker service (51 %). In terms of perceived outcomes of traditional healer treatment, 95 % reported that their condition “improved a lot” or “improved a bit”. Almost all patients (98 %) who

went to traditional healers felt that traditional and hospital treatments gave equal results (Table 3).

Thematic analysis of the open responses from patients who did attend the referral is shown in Table 4. Positive referral experiences were a dominant theme, shaped by the responsiveness and professionalism of the receiving hospital staff. One patient described, “I was received with much urgency. I was treated very well; the hospital workers were always conscious.”

Potential barriers to referral attendance included a lack of bed space at the referral hospital and impersonal treatment from some healthcare providers. For example, a patient remarked, “the treatment received was very bad at the hospital. The attitude of the nurses towards me was impersonal.”

A subset of referred patients reported seeking traditional treatment even after attending their hospital referral, with themes of unaffordable hospital charges, and feeling that their health did not improve. However, patients also discussed seeking traditional care even after improvements in their health with hospital-based care. Patients who sought traditional care due to unaffordable charges at the referral hospital more often noted a positive hospital experience, punctuated by inability to pay the bill. For example, one patient notes, “I did not have enough money for the hospital treatment so I was on herbal treatment for 5 months. After 5 months I got money to afford the hospital treatment so I had my surgery done and I am much better now. The hospital service was good. I was given intensive treatment.” Patients who reported seeking traditional care because their health did not improve with referral hospital care focused primarily on their health status. One patient remarked, “I was discharged even though my condition had not improved. I further received treatment from a traditional healer and my condition has improved a bit.” Finally, themes of how to improve the referral experience arose, focused on interhospital communication and policy development and enforcement, suggesting, “the referring hospital should communicate well with the referral hospital before a referral note is given.”

## Discussion

Referral systems are central to trauma care provision and understanding patient motivation to attend referrals after traumatic injury is necessary to facilitate the acceptance of definitive medical treatment and to improve outcomes. In this survey-based qualitative study of patient referral attendance, we found that non-attendance was associated with being male, sustaining a fracture and having less severe injuries. Furthermore, the majority of patients who did not attend their referral

**Table 3**  
Responses of injured patients who did not attend referrals after initial management at emergency units of select Ghanaian district and regional hospitals (N = 56).

	N	(%)
<b>Reason for not attending the referral</b>		
Due to financial problems	33	(59)
Due to difficult means of transport	11	(20)
Because the referral hospital is far away from where I live	3	(5)
Due to influence of family or friends	25	(45)
Referral hospital was out of service on the weekend	1	(2)
Multiple reasons	24	(43)
Went to the traditional healer	43	(77)
<b>Reasons for preferring traditional healer (n = 43)</b>		
Due to cultural reasons	5	(12)
Because they provide quicker service	22	(51)
Because their service is cheaper	34	(79)
<b>Outcome of traditional healer treatment (n = 43)</b>		
No change in condition	2	(5)
Condition improved a bit	10	(23)
Condition improved a lot	31	(72)
<b>Traditional and hospital treatments give equal results (n = 43)</b>		
No	1	(2)
Yes	42	(98)

**Table 4**  
Description of themes emerging from reported experiences of patients who attended referrals.

Theme	Subcategories	Statement Examples
<b>Positive referral experience</b>	Professionalism	<i>The nurses were friendly they received me well, treatment was good.</i>
	Responsiveness	<i>I was received with much urgency. I was treated very well, the hospital workers were always conscious</i>
<b>Seeking traditional treatment after attending referral</b>	Concern for referral hospital charges	<i>The way they received me was very welcoming, but after explaining everything to me, I could not afford the bill, so I considered a traditional herbalist.</i> <i>I did not have enough money for the hospital treatment so I was on herbal treatment for 5 months, after 5 months I got money to afford the hospital treatment so i had my surgery done and i am much better now. The hospital services was good, I was given intensive treatment.</i>
	Lack of health improvement	<i>I was treated at the referral hospital, but after I was discharged, my condition was not much better, so I considered a traditional herbalist and I think my condition has improved very well.</i> <i>I was discharged even though my condition had not improved. I further on received treatment from a traditional healer and my condition has improved a bit.</i>
	Health improvement but still sought traditional treatment	<i>I was admitted for a week and treatment was given to me, I am better now, but I also tried the traditional treatment for sometime after I was discharged I was treated good and medically well attended to as well. Few weeks later after been discharged, my family sent me to a traditional herbalist. But for a while now I have not been feeling too well and as a result of that, my family is planning to send me back to the hospital again.</i>
<b>Barriers to referral attendance</b>	Bed Space	<i>There was no bed at the referral hospital so I went to another hospital</i>
	Impersonal Treatment	<i>The treatment received was very bad at the hospital. The attitude of the nurses towards me was impersonal.</i> <i>Some of the nurses were good towards me, others were so impersonal, that is human nature so I cannot complain much</i>
<b>Improving the referral experience</b>	Interhospital communication	<i>The referring hospital should communicate well with the referral hospital before a referral note is given</i>
	Referral policy development	<i>[The] government should place much focus in our health sectors, so that patients do not get stranded when they are to receive treatment, and also enforce policies about referrals, to make it smoother</i>

sought treatment from traditional healers, reporting that it is cheaper, care is faster, and outcomes are similar to hospital-based care. Patients also addressed additional barriers to referral attendance, including impersonal treatment at the hospital and lack of bed space. These findings suggest that targeted engagement of patients with fractures, alongside policies to improve trauma care cost and delivery, may improve the rate of referral attendance in the Ghanaian context.

Trauma patients who do not attend a referral after initially presenting to a hospital represent a unique population of patients who initially seek hospital-based assessment, but ultimately do not pursue definitive hospital-based treatment. Our findings that higher referral non-attendance was associated with male sex, sustaining a fracture, and having a less severe injury resonate with prior research on care delays after injury, both in the Sub-Saharan African region, and globally. A prior study of 18 LMICs comparing care delays for patients with open versus closed fractures found that the median time to hospital admission was five and seven hours for open and closed fractures, respectively, with over 27 % of patients experiencing delays of over 24 h.<sup>16</sup> Specifically in Africa, the most frequent reason for delays was interfacility referral, followed by treatment from a traditional healer. Similarly, Nkurunziza et al., found that among 1227 injured patients in Rwanda who were given a referral, having a closed fracture or dislocation was associated with 16 times higher odds of a delay in referral attendance.<sup>17</sup> We also found that higher proportions of men did not attend their referrals. Similarly, prior studies of trauma care delays in Rwanda and Tanzania have found that men are over-represented in comparison to women when examining delayed fracture care and delayed initial presentation after injury.<sup>17,18</sup> As such, men may be a population to focus on when implementing interventions to help patients receive definitive trauma care.

Previous studies of the trauma referral system in Ghana have identified financial exposure and care disorganization as primary causes of referral non-attendance.<sup>19–21</sup> Another leading reason for referral non-attendance in our study cohort was preference for treatment from the traditional healer. This finding, contextualized by existing literature, suggests that although the decision to attend or not attend a referral after traumatic injury is multifactorial, it may be primarily influenced by patient-held beliefs. When examining the preference for traditional bone healers in Northern Ghana, Kuubiere et al., also found that beliefs were the driving factor in patient decision making followed by costs, while Yempabe et al., found that cost was the most frequently cited reason for preferring bone setters in the same region, although with a smaller sample size.<sup>20,22,23</sup>

Several facilitators and barriers to referral attendance emerged from our data. Among those who attended their referral, positive experience with staff and conscientious treatment were the dominant theme facilitating referral attendance. Despite this, poor interhospital communication, lack of referral hospital bed space, and impersonal treatment were cited as persistent barriers to referral attendance. Some patients who sought care from traditional healers, did so due to the high cost of hospital treatment or feeling that their health was not improving with hospital-based care. This points yet again to the multifactorial nature of deciding to follow through with presentation to a referral hospital. Specifically, there appears to be a convergence of familial/community beliefs, compounded by cost of care and a perceived low severity of injury, that contributes to a patient preferring the traditional healer, rather than continuing their care within the hospital system. The majority of our patients who did not attend the referral but rather went to the traditional healers (95 %) self-reported some improvement in their condition. Although we do not have data to objectively verify their claim, it is worth noting that only 14 % of them had a severe injury (ISS  $\geq$ 9). Hence, it is plausible that these patients are appropriately self-triaging their injuries for treatment. In a report from Ethiopia, where local belief in traditional bone setters is widespread, 73 % of fracture patients reported that they were cured following utilization of their services.<sup>24</sup>

A minority (9 %) of severely injured patients did not attend the referral, reflecting the weakness in Ghana's trauma care system to adequately deliver care for the severely injured without a break in the continuum of care.

Finally, two themes relevant to policy considerations arose from the patient perspective: first, improving interhospital communication, and second enacting and enforcing context-specific referral protocols. With respect to interhospital communication, prior work by Gyedu et al., demonstrated that structured referral forms can improve communication of essential concerns, particularly when paired with feedback from referral hospitals.<sup>21</sup> Regarding referral protocols, several publications have similarly called for national protocols for triaging common surgical conditions<sup>2</sup>; however, these do not address mechanisms for improving referral attendance. A third policy consideration would be to increase resources at district hospitals. Nkurunziza et al., advocate for improving the capacity of district hospitals to manage less severe fractures in order to mitigate referral delays and referral non-attendance.<sup>17</sup> Although regionalized trauma systems are the bulwark of modern trauma care,<sup>25–27</sup> context-specific needs at LMICs are worth considering.

Our study has some limitations that must be addressed. First, the number of hospitals involved in the study may not be enough to represent all non-tertiary hospitals in Ghana. However, these were purposively selected to represent hospitals with high inflow of injured patients in the country ( $\geq 75$  per month). Second, 25 % of referred patients could not be reached despite repeated attempts to contact them. However, these patients were not different in characteristics from those who were reached and surveyed (Supplement Table 1). Despite these limitations, to our knowledge, this study has one of the largest sample sizes among published studies on injury referral non-attendance in Ghana that incorporates qualitative, open-ended responses from the patient perspective.

In conclusion, males, sustaining fractures, and low severity injuries in Ghana are associated with increased odds of not following through with referrals from non-tertiary hospitals, with care seeking from traditional healers largely driven by community influence and concerns of cost, and specific hospital-based factors. Targeted engagement of patients with fractures and low severity injuries, context-driven referral protocols, capacity-building at district hospitals, and continued strengthening of various components of the nation's trauma system represent opportunities to improve referral attendance for trauma care in Ghana and other LMICs.

#### Declaration of competing interest

The authors declare no conflict of interest.

#### Author contribution

Authors contributed as follows to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: AG 30 %; LLA, AI 25 % each; SS 20 %. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

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#### Data availability

The datasets generated during and/or analyzed during the current

study are not publicly available but are available from the corresponding author on reasonable request.

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#### Dissemination of Results

Findings of this study were shared with staff members at the study hospitals from which the injured patients were referred in an informal presentation in the grand rounds.

#### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.afjem.2024.04.001.

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