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ORIGINAL ARTICLE

Use of healthcare services by injured people in Khartoum State, Sudan

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Background: Trauma care is an important factor in preventing death and reducing disability. Injured persons in low- and middle-income countries are expected to use the formal healthcare system in increasing numbers. The objective of this paper is to examine use of healthcare services after injury in Khartoum State, Sudan.

Methods: A community-based survey using a stratified two-stage cluster sampling technique in Khartoum State was performed. Information on healthcare utilisation was taken from injured people. A logistic regression analysis was used to explore factors affecting the probability of using formal healthcare services.

Results: During the 12 months preceding the survey a total of 441 cases of non-fatal injuries occurred, with 260 patients accessing formal healthcare. About a quarter of the injured persons were admitted to hospital. Injured people with primary education were less likely to use formal healthcare compared to those with no education. Formal health services were most used by males and in cases of road traffic injuries. The lowest socio-economic strata were least likely to use formal healthcare.

Conclusions: Public health measures and social security should be strengthened by identifying other real barriers that prevent low socio-economic groups from making use of formal healthcare facilities. Integration and collaboration with traditional orthopaedic practitioners are important aspects that need further attention.

Keywords: Health utilisation, Household survey, Socio-economic factors, Sudan, Trauma care

Introduction

Global public health strategies are currently aimed towards universal health coverage. The growing burden of injuries in low- and middle-income countries (LMIC) represents serious public health challenges in the field of prevention, treatment and rehabilitation.[1] In the case of injuries, emergency and trauma care should be an essential part of universal health coverage.[1] Understanding how healthcare services are currently sought, accessed and utilised by injured persons is important to reduce the fatal and non-fatal consequences of injuries. Yet, a major problem is the lack of data about early health-seeking behaviour, first responder care and the quest for treatment when people are injured.[2]

Sudan is a country with scarce health resources. The total expenditure on healthcare per capita is US$180 compared to US$310 dollars in Egypt.[3] A national survey, the Sudan Household Health Survey (SHHS), was carried out by the Ministry of Health and Central Bureau of Statistics in 2010, in collaboration with other institutions and organisations.[4] The SHHS recently explored injury occurrence at a national level with a short injury module. The findings from the SHHS revealed that about half of the injured people took advantage of formal healthcare, while about 30% went to a traditional healer.[4] Besides formal healthcare offered by trained professionals in public and private institutions, traditional healing is common in several urban and rural populations in low-income countries, and it has strong historical and socio-cultural roots. In Sudan, as in many other developing countries, traditional orthopaedic practice is a key domain of local health knowledge.[5,6]

In the case of Khartoum State, formal health services are heavily centralised. This is reflected by a specialist services coverage that is double the national ratio in Sudan, as is the case for other health services and cadres.[7] In Khartoum State, injuries are one of the ten leading reasons for attending the outpatient clinics and formal health units.[7] Traditional healers and bone

setters are also widely sought for treatment of injuries.[8] Therefore, this state presents an interesting setting for studying a combination of both formal and informal healthcare systems.

Previous work in Sudan has not addressed healthcare utilisation for injury in sufficient detail. This study seeks, in particular, to explore early health-seeking trajectories and interventions. The purpose is to determine the extent to which first aid is provided, to examine the means of transport used to reach healthcare facilities, to identify population groups that are most likely to use formal healthcare, and to explore the reasons behind the choice of formal versus informal healthcare.

Materials and methods

Study setting

Khartoum State is the most populous state in Sudan with a total population of 5.2 million. It is geographically centrally located in the country, and administratively it is divided into seven localities. The majority of this state's population, about 80%, lives in urban areas. In terms of economic opportunities it is the most privileged state, as it contains the capital city of the country.

The Sudanese healthcare system hierarchy is composed of three main levels: Federal, State and Locality Health Management Authorities. Hospitals are classified as teaching, general and speciality hospitals.[7] In total, Khartoum State has 49 hospitals and 15 intensive care units, with 9 hospitals located in rural areas. Trauma care is provided through emergency departments in four teaching hospitals. The state has 26% of the country's total hospital beds and 70% of emergency room beds. As an indicator of surgical capacity, half of all Caesarian sections in Sudan are carried out in Khartoum State.[7]

Sampling technique

A retrospective cross-sectional community-based survey was conducted in Khartoum State in 2010, using a stratified two-stage cluster sampling technique. The cluster was the smallest geographical bordered unit, which is the popular administrative unit in the case of urban localities, and the village in rural areas. The cluster represented the primary sampling unit in this study. Cluster size was partly determined by how many households could be interviewed per day, which was identified as 20 households per day. The sampling technique has been described elsewhere in detail.[9]

The target sample size calculated was 1006 households in Khartoum State. Sample size calculation was based on an estimated injury prevalence of 50% with 95% confidence level, 5% absolute precision, design effect of 2, and an average household size of 6 as determined by the latest Sudanese census. The sample size was further increased to accommodate precise estimation of statistics within subgroups.[10–12]

The first stage of sampling was to stratify data according to urban/rural status. Urban areas constitute 80% of the state, while 20% is made up of rural areas. These percentages were attained by dividing the total number of households in urban areas by the total number of households in the whole state. Our stratification and sampling frame were based on the latest census results.[12] The probability proportionate to size technique was applied to randomly select clusters from the seven localities of Khartoum State. Twenty households were selected from each cluster using systematic random sampling.

Data collection

Data were collected by 3 teams, made up of a total of 12 research assistants and 3 field leaders. The data collection teams were trained on how to perform face-to-face interviews. Information was collected by the teams from all household members. In Sudan, female heads of household are usually more knowledgeable of the events affecting the family and other relevant details, and national surveys (e.g., SHHS) normally rely on them as main respondents. In our study, the female heads of household were identified as respondents. If a female head of a household was absent, the next eligible adult was interviewed. In case of injury, the injured person was also interviewed. If this person was absent or under 18 years of age, an adult proxy was assigned. No one under the age of 18 was interviewed alone.

The survey utilised three questionnaires. Each questionnaire has been described elsewhere in detail.[9] The injury definition was adopted from WHO's definition and examples of injuries were given to respondents.[11] First aid was defined in our study as any initial care given to injured persons and examples such as help with breathing, control of bleeding by pressure and fixing fractures were given to respondents. Formal healthcare refers to treatment at a governmental or private health facility licensed by the Ministry of Health. Those who utilised home treatment, traditional healers and bone setters were grouped under informal healthcare. Injury-related data were collected with a recall period of 12 months and each injury's medical care history was explored. Questions were asked about first aid, means and duration of transport to a formal health facility, the type of health facility used and the reasons behind the choices. We also asked respondents about their reasons for not utilising the formal healthcare system. The survey tool was constructed in English and translated into Arabic and then back translated. Survey methods and instruments were pre-tested and as a result modifications to the tool were made.

Data analysis

Data entry and double data entry for verification were performed using CSPro V.4.1 (US Census Bureau, Washington DC, USA). Data cleaning and analysis were carried in IBM SPSS V.21 (IBM Corp., Armonk, NY, USA). For the purpose of this paper, only data collected from injured persons were analysed. Injuries that resulted in at least 1 day of normal daily activity loss were included in the analysis.

Principal component analysis was used to construct a composite household wealth index. Socio-economic status categories were defined by the quintiles of this index.[13,14] We performed cross tabulations to show the type of health services used by injured persons and factors promoting and inhibiting their utilisation. A logistic regression analysis was carried out for all injury-related events to determine which factors affected the probability of using formal healthcare. The factors considered were residence, sex, age, education, socio-economic status, cause of injury and place where the injury occurred. All cases with missing information on healthcare use were excluded from the analysis, except in the logistic regression, where they were

included in the category representing those who did not explicitly use formal healthcare.

The study was approved by the National Health Research Ethical Committee (Sudan) and written consent was obtained from all respondents interviewed.

Results

The household response rate in urban and rural popular administrative units was 97.3% (778/800) and 97.5% (195/200), respectively. The average household size was 5.9 in urban and 4.9 in rural areas. The total number of individuals included was 5661, residing in 973 households. Injuries that resulted in at least 1 day of normal daily activity lost occurred in 441 cases. Among these, 168 injuries (38.1%; 168/441) occurred in individuals aged 0–15 years, 197 (44.7%; 197/441) in individuals aged 16–44 years and 76 (17.2%; 76/441) in those aged 45 years or older. First aid was provided in almost half of the total injury events (203/441). It was administered by family or friends in 33.6% (148/441) of all cases, while less than 1.6% (7/441) of the injured received first aid from medical personnel.

About 20.9% (92/441) of the injured persons who utilised formal healthcare were admitted to a hospital (data not shown). The formal health sector is classified into public and private services, while the informal sector is divided into home treatment and traditional healers/bone setters. Table 1 shows the cause of injury and type of health facility used as a first option. Public healthcare facilities treated half of the total number of injuries. Seventy seven percent (51/66) of those suffering road traffic injuries (RTI) used public health services, while 37.6% (53/141) of those injured after falls were treated at public facilities. Forty two percent (19/45) of the burns were treated at home. Formal healthcare was used to treat a total of 260 injuries classified as follows: 177 (68.1%) went to hospitals, 66 (25.4%) went to clinics/health units/doctors and the remaining 17 (6.5%) used other options.

Informants were asked about their second choice of health provider sought after their first option. A total of 74 patients utilised a second option of which 60% (44/74) sought formal health services and 39% (29/74) used the informal health sector.

Table 2 shows the means of transport used to reach formal healthcare, cross-tabulated by socio-economic status and urban/rural residence. In the lowest socio-economic group, 16% (7/44) walked or used public transport to reach a healthcare facility. In the case of the highest socio-economic group, 53% (29/55) used a private car. Table 2 shows that nearly a quarter of the injured from both urban (26%; 56/215) and rural (27%; 12/45) residents used a private car as means of transport to reach the health facility, with hardly any difference between the two areas. A taxi or public transport was used by 59% (30/51) of people in the middle socio-economic group. The majority of people reached the healthcare facility in less than an hour in urban areas (90.0%; 194/218), while in rural areas, 80.4% (37/46) had travel time of under an hour.

Males were almost twice as likely to use formal healthcare services compared to females, with an adjusted odds ratio of 1.88 (95% CI 1.16–3.04) (Table 3). Age was not a significant predictor of using formal healthcare, in particular after adjustment for other factors. After adjustment, significant contributions were made by level of education, socio-economic status and cause and place of injury, in addition to sex. As compared to those with no education, persons with primary/khalwa (Qoranic preschool) education were less likely to use the healthcare service with an estimated OR of 0.39. The group with lowest socio-economic status was less likely to use formal health services, with an estimated adjusted odds ratio of 0.26 (95% CI 0.11–0.61) compared to those belonging to the highest status. The cause of injury also played an important role in determining the type of healthcare sought, with those injured by falls and burns being rather unlikely to use formal healthcare. Those acquiring a sports injury were also less likely to use formal healthcare (OR 0.23; 95% CI 0.10–0.54), compared to home injuries.

Table 4 shows the reasons given for using formal healthcare, stratified by sex and socio-economic status. In the lowest socio-economic strata the main reason given was the seriousness of the injury, while for the highest socio-economic stratum, distance to health facility was the main reason provided. The proximity of the healthcare facility was expressed as one of the main reasons to use formal healthcare service across all socio-economic groups.

Table 1. Type of healthcare facility visited for each cause of injury, Khartoum State, Sudan, 2010

Type of health facility	RTI	Falls	Mechanical injuries	Burns	Poisoning	Violence	Others	Total[a] n (%)
Formal healthcare								
Public	51 (77%)	53 (37.5%)	30 (38%)	15 (33%)	14 (52%)	24 (69%)	11 (50%)	198 (47.5%)
Private	6 (9%)	15 (10.6%)	18 (23%)	10 (22%)	4 (15%)	4 (11%)	5 (23%)	62 (14.9%)
Informal healthcare								
Home treatment	7 (11%)	36 (25.5%)	25 (31%)	19 (42%)	9 (33%)	6 (17%)	5 (23%)	107 (25.7%)
Traditional healers/bone setter	2 (3%)	37 (26.2%)	7 (8%)	1 (2%)	0 (0%)	1 (3%)	1 (5%)	49 (11.7%)
Total	66 (100%)	141 (100%)	80 (100%)	45 (100%)	27 (100%)	35 (100%)	22 (100%)	416 (100%)

RTI: Road traffic injuries.
[a] 25 cases with missing information.

Table 2. Means of transport to reach the formal healthcare facilities by residence and socio-economic status, Khartoum State, Sudan, 2010

Means of transport	Residence		Socio-economic status					Total n (%)
	Urban	Rural	Lowest	Low	Middle	Higher middle	High	
By foot	21 (9.7%)	6 (13%)	7 (16%)	8 (13%)	5 (10%)	4 (8%)	3 (5%)	27 (10.3%)
Private car	56 (26.0%)	12 (27%)	6 (13%)	12 (19%)	7 (14%)	14 (29%)	29 (53%)	68 (26.1%)
Taxi	52 (24.1%)	8 (18%)	6 (13%)	12 (19%)	15 (29%)	15 (31%)	12 (22%)	60 (23.0%)
Public transport	44 (20.4%)	7 (16%)	7 (16%)	11 (17%)	15 (29%)	11 (23%)	7 (13%)	51 (19.6%)
Ambulance	6 (2.7%)	4 (9%)	3 (7%)	3 (5%)	1 (2%)	2 (4%)	1 (2%)	10 (3.8%)
Animal cart	1 (0.4%)	2 (4%)	3 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (1.1%)
Others	35 (16.2%)	6 (13%)	12 (27%)	16 (26%)	8 (16%)	2 (4%)	3 (5%)	41 (15.7%)
Total	215 (100%)	45 (100%)	44 (100%)	62 (100%)	51 (100%)	48 (100%)	55 (100%)	260 (100%)

For those who did not use formal healthcare the main reason given for both sexes was that no serious injury was sustained (Table 5). Distance was another barrier expressed by persons from the lower socio-economic strata. Affordability of the formal health service ranked third in defining the type of care chosen among the injured.

Discussion

The post-millennium development goals, with a special emphasis on improving universal health coverage for injured people, are central to the discussion of our findings on pre-hospital trauma care trajectories, including first aid responses, transport to health facilities and choice of type of healthcare. The results of this community-based survey study in Sudan highlight the need to understand the dynamics of healthcare utilisation in detail.

We have found pre-hospital care to be given in a form of first aid by relatives or friends in less than half of the injured persons. There is existing evidence showing how pre-hospital care can reduce mortality.[15,16] Pre-hospital care is scarce in most LMICs, and investing in training potential first-responders identified by local communities can be valuable.[17] Adequate pre-hospital and hospital care can reduce both mortality and disability.[18] For instance, the training of healthcare workers in trauma care in Iraq and Cambodia have led to lower mortality rates.[19] Training of lay first responders in Iraq also proved to be crucial for trauma survival when transport times were long.[20]

In relation to emergency transport, there are 22 strategically located ambulance centres in the state of Khartoum, with 28 ambulance cars to serve communities. In 2009, Khartoum State officially opened a free call centre for the ambulance services.[21] However, the main means of transport used in our study were similar to what was found in other LMICs, where those injured were mainly dependent on the use of a commercial or private car.[22,23] This could indicate that the ambulance services are still not readily available for injured people. Possibly some injuries were not perceived by those injured or their families to be severe enough to warrant calling an ambulance. Another possible explanation can be that ambulance services may still be perceived as nothing more than means of transport.

Similar to the pattern of healthcare utilisation in Ghana,[24] only about half of the injured used formal healthcare. A difference is that hospitals were more frequently attended in our study, while in Ghana where the study was conducted in a predominantly rural setting, injured persons mainly used primary healthcare centres. Nevertheless, the injured in rural Khartoum also attended hospitals more frequently. As for those who sought informal healthcare, short distance and severity of the injury were the main reasons expressed.

In Sudan, traditional healers and bone setters are involved in treating many types of injuries. Traditional medicine is deeply embedded in the culture and it has strong historic roots making its use still common today.[25,26] In Nigeria, similar patterns of traditional medicine use in case of injuries have been observed, where the reasons given for opting for traditional healers and bone setters were close proximity and low cost.[27] The use of traditional orthopaedic practitioners thus resembles a similar situation in sub-Saharan African countries.[5,6] Despite the use of traditional medicine by large parts of rural populations in LMICs and despite the shortage of trauma care professionals, traditional orthopaedic practitioners seem to be neglected by official health-care programmes.[5] Collaborative programmes for re-training and integrating the work of these practitioners could be effective in reducing post-trauma morbidity.[19,28,29] Our results indicate that this is an important alternative that needs to be considered when planning injury healthcare in Sudan.

After controlling for confounding factors such as education, occupation and socio-economic status, males in our study were more likely to use formal care. Although the reason for this gap was not examined, this finding implies an inequality in access to services that is common in other settings.[30] More attention should be given to gender inequality and other socio-cultural factors. The lowest socio-economic group was less likely to use formal healthcare, which could be due to financial barriers. However, this was not evident from the reasons provided for not using formal healthcare, although this may be related to the reduced sample size after further aggregation of the data. These results need further exploration in future research.

According to Andersen's behavioural model, perceived health status is a major determinant of healthcare choice.[31] This may explain why perceived injury severity was the main reason for choosing formal healthcare in our study. People with major injuries preferred the formal healthcare sector, whereas those with minor injuries were more likely to choose informal care.

Table 3. Logistic regression analysis showing characteristics of injured persons who are most likely to use formal healthcare in Khartoum State, Sudan, 2010

Characteristics	Utilised formal healthcare	Total injured[c]	Crude OR	95% CI	p-value	Adjusted OR[d]	95% CI	p-value
Residence					0.10			0.18
Rural	44	86	0.67	(0.42–1.08)		0.68	(0.39–1.20)	
Urban	216	355	1.00			1.00		
Sex					0.03			0.01
Male	171	272	1.52	(1.03–2.25)		1.88	(1.16–3.04)	
Female	89	169	1.00			1.00		
Age groups (years)					0.06			0.60
45+	51	76	1.85	(1.05–3.27)		1.36	(0.69–2.66)	
16–44	121	197	1.45	(0.95–2.20)		1.22	(0.73–2. 04)	
0–15	88	168	1.00			1.00		
Level of education[a]					0.19			0.02
Diploma/University	57	112	1.47	(0.81–2.68)		0.69	(0.29–1.63)	
Secondary	57	146	0.89	(0.52–1.54)		0.51	(0.26–1.00)	
Primary/khalwa	79	100	0.79	(0.48–1.30)		0.39	(0.21–0.73)	
No education	67	83	1.00			1.00		
Socio-economic status[b]					0.004			0.003
Lowest	46	102	0.32	(0.17–0.60)		0.26	(0.11–0.61)	
Low	63	111	0.51	(0.27–0.96)		0.48	(0.21–1.09)	
Middle	50	74	0.81	(0.40–1.63)		0.94	(0.39–2.23)	
Higher middle	47	79	0.57	(0.29–1.12)		0.50	(0.23–1.09)	
High	54	75	1.00			1.00		
Cause of injury					0.001			0.002
Falls	65	139	0.23	(0.12–0.45)		0.17	(0.07–0.42)	
Mechanical injuries	77	126	0.41	(0.21–0.81)		0.40	(0.17–0.94)	
Burns	25	46	0.31	(0.14–0.71)		0.24	(0.08–0.69)	
Poisoning	13	23	0.34	(0.13–0.93)		0.35	(0.10–1.15)	
Others	23	35	0.50	(0.20–1.24)		0.51	(0.18–1.46)	
Road traffic injuries	57	72	1.00			1.00		
Place of injury					0.002			0.002
School	10	13	2.70	(0.72–10.12)		2.51	(0.59–10.60)	
Street/highway	86	127	1.70	(1.07–2.71)		0.75	(0.39–1.42)	
Sports/athletic area	13	40	0.39	(0.19–0.80)		0.23	(0.10–0.54)	
Industrial/construction area	15	21	2.03	(0.76–5.44)		1.98	(0.64–6.12)	
Others	25	39	1.45	(0.71–2.95)		1.41	(0.63–3.13)	
Home	111	201	1.00			1.00		

[a] Education of head of household was taken as proxy for children aged <15 years.
[b] Quintiles of wealth index based on factors such as home ownership, number of rooms and households assets.
[c] 27 cases with missing information were included in the 'not utilised healthcare' category.
[d] Adjustment carried out for all other characteristics included in the table.

When relating data on the cause of injury to the utilisation of health services, persons injured due to falls were found to be less likely to seek formal healthcare. One explanation could be that falls are generally less serious, resulting in less need for hospital care, while RTIs more likely require professional care. Another explanation could be that regardless of severity, the injured are checked in hospital to evaluate the level of harm incurred by RTIs, which is part of the legal process in Sudan.

The strength of this study is that there was a high response rate from injured people in the community regarding their choices of healthcare. The results can be generalised to the largest state in Sudan. A limitation of the study is that we were unable to adjust for severity due to the lack of a meaningful measure of severity in the cross-sectional retrospective survey. We recognise that application of stricter inclusion criteria for the injuries experienced could have led to a somewhat different

Table 4. Main reasons given by injured persons for using formal healthcare, Khartoum State, Sudan, 2010

	Sex		Socio-economic status					Total[a] n (%)
	Female	Male	Lowest	Low	Middle	Higher middle	High	
Affordable	2 (2%)	5 (3.0%)	1 (2%)	4 (7%)	1 (2%)	0 (0%)	1 (2%)	7 (2.8%)
Close to residence	23 (27%)	46 (28.0%)	13 (29%)	14 (23%)	17 (35%)	11 (25%)	14 (26%)	69 (27.6%)
Drugs are available	1 (1%)	5 (3.0%)	1 (2%)	0 (0%)	4 (8%)	0 (0%)	1 (2%)	6 (2.4%)
Major injury	32 (37%)	64 (39.0%)	25 (56%)	27 (45%)	16 (33%)	16 (36%)	12 (23%)	96 (38.4%)
Minor injury	3 (3%)	5 (3.0%)	2 (4%)	3 (5%)	0 (0%)	1 (2%)	2 (4%)	8 (3.2%)
Short waiting time	0 (0%)	2 (1.2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (4%)	2 (0.8%)
Experienced health provider	10 (12%)	9 (5.4%)	1 (2%)	4 (7%)	2 (4%)	6 (14%)	6 (11%)	19 (7.6%)
Insurance to cover costs	4 (5%)	4 (2.4%)	0 (0%)	1 (2%)	1 (2%)	4 (9%)	2 (4%)	8 (3.2%)
Others	11 (13%)	24 (14.6%)	2 (4%)	7 (12%)	7 (15%)	6 (14%)	13 (25%)	35 (14.0%)
Total	86 (100%)	164 (100%)	45 (100%)	60 (100%)	48 (100%)	44 (100%)	53 (100%)	250 (100%)

[a] 10 cases with missing information.

Table 5. Main reasons for not using formal healthcare after an injury, Khartoum State, Sudan, 2010

Reasons	Sex		Socio-economic status					Total[a] n (%)
	Female	Male	Lowest	Low	Middle	Higher middle	High	
Too far	11 (16%)	10 (14%)	12 (24%)	6 (17%)	2 (10%)	0 (0%)	1 (7%)	21 (15.0%)
Cannot afford service	8 (12%)	8 (11%)	8 (16%)	3 (8%)	4 (19%)	0 (0%)	1 (6%)	16 (11.4%)
No serious injury	36 (54%)	42 (55%)	18 (35%)	19 (51%)	15 (71%)	16 (89%)	10 (63%)	78 (55.7%)
No insurance to cover cost	2 (3%)	3 (4%)	0 (0%)	4 (11%)	0 (0%)	1 (6%)	0 (0%)	5 (3.5%)
Long waiting time	0 (0%)	1 (1%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.7%)
Mistreatments by health provider	0 (0%)	1 (1%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.7%)
Other	10 (15%)	8 (11%)	11 (22%)	4 (11%)	0 (0%)	1 (6%)	2 (13%)	18 (12.8%)
Total	67 (100%)	73 (100%)	51 (100%)	36 (100%)	21 (100%)	18 (100%)	14 (100%)	140 (100%)

[a] 41 cases with missing information.

impression of healthcare preferences. Furthermore, the recall period of 12 months may have biased the information collected. Recalling specific details may be challenging to one's memory mainly due to memory decay or loss. Information collected may also be affected by a telescoping effect, which is the tendency for events happening outside the recall period to be included erroneously, introducing a bias. The reasons given by respondents for using formal and informal care are also subject to social desirability bias. For example, respondents with higher education may not have disclosed their use of traditional care. Lastly, we have not included the health providers' perspectives in this study.

Conclusions

This study determined that people of low socio-economic status were less likely to use formal healthcare when injured. Public health and social security measures should be taken into account to reduce the costs of accessing emergency healthcare services to ensure universal health coverage for trauma care. Various barriers to early intervention should be identified and dealt with, promoting increased awareness about the importance of prompt trauma care to prevent long term disability. Pre-hospital care and training of first aid providers, as well as potential collaboration with traditional orthopaedic practitioners, are important dimensions that need further attention.

Authors' contributions: SET conceived the study, carried out the data collection, data analysis, interpretation of data, drafting and revision of the manuscript; SA, IH and GVDB contributed to the study conception, to the analysis, interpretation of data and to revising the manuscript. All

authors read and approved the final version of the manuscript. SET is the guarantor of the paper.

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