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Assessment of Emergency Care Quality in Public Hospitals of Tigrai, North Ethiopia

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Abstract

Background: Emergency service quality is the degree to which individuals and populations increase the likelihood of desired health outcomes consistent with current professional knowledge. Considering the evidence gap, the study was undertaken to investigate the quality of emergency services in public hospitals of Tigrai, North Ethiopia.

Objective: The objective of the study was to assess the emergency care quality in public hospitals of Tigray region, northern Ethiopia.

Methods: Facility based cross-sectional study was employed and the study was conducted from April-June, 2019. The study assessed the emergency care quality using the main components: Availability of basic infrastructure and resources, access to basic emergency services, and patient and staff satisfaction, and waiting time to emergency care.

Results: The study revealed that the overall emergency service availability and readiness score, and access to basic emergency services score were 64% and 61%, respectively. The emergency patients and staff satisfaction scores were 60% and 65%, respectively. The average patient waiting time to emergency care in the hospitals was 8 minutes. Separate emergency examination (0%) and isolation (56.25%) rooms were rarely in use. Availability of basic medical equipment was nearly 50%. Together with lack of appropriate trainings (50%), scarcity of physicians, pharmacy (29%), and laboratory (43%) professionals were major challenges affecting the human resource of the emergency care. Hence, the laboratory, radiology and pharmacy emergency services were not providing 24 hours a day.

Conclusion: Quality of emergency service was poor and inadequately implemented when compared with the national and regional predetermined targets. Therefore, the regional health bureau should regularly monitor and address the gaps identified together with program implementers, funders and other stakeholders.

Keywords: Emergency care; Service quality; Satisfaction; Waiting time; Availability

Abbreviations: ED: Emergency Department; EHRIG: Ethiopian Hospital Reforms Implementation Guideline; ETAT: Emergency Triage and Treatment; GP: General Practices; RBS: Random Blood Sugar; SPSS: Statistical Package for Social Science

Introduction

Emergency services are a network of services and resources coordinated to provide aid and healthcare assistance from primary response to definitive care, involving trained personnel and use of appropriate technologies in the rescue, stabilization, transportation, and advanced treatment of traumatic, obstetric and medical emergencies [1]. Those services are said to be accessible if they are directly and permanently accessible with no undue barriers of cost, language, culture, or geography. Besides, such services should be close to the people, with a routine point of entry to the service network at primary care levels [2].

Emergency service quality is the degree to which emergency services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge, and has six dimensions: a care that is safe, effective, patient centered, timely, efficient, and equitable [3,4]. Health services are of high quality if they are effective, safe, patient centered and given in a timely fashion.

Patient waiting time is a key indicator of the quality of health service in that it examines the effectiveness and efficiency of the service to patients. Waiting times have constantly been a problem for outpatients [5]. Patients experience in waiting time radically influences his/her perceptions on quality of health service. Emergency patient flow is perceived as a linear construct, and patient wait time become more irritating, frustrating and a source of great dissatisfaction [6-8].

Emergency programs can no longer be considered non-essential in international health development as disease burden is shifting away from communicable disease toward accidents,

injuries, and non-communicable disease [9,10]. There is a heavy patient load on emergency departments worldwide. This massive and often undulating inflow generates suboptimal working conditions, resulting in overcrowding and long waiting time with risks for medical errors. Furthermore, crowding is a major patient safety concern and associated with reduced patient satisfaction [11,12]. Hence, properly designed and implemented hospital based emergency care will reduce patient emergency triage and treatment time; increase provider efficiency, and staff and client satisfaction as well as improve overall quality of care [13].

Hospitals in Africa are often staffed by professionals without the support of emergency care training. Although road traffic incidences and fatality rates are very high, delivering timely care and getting victims to a health care facility is neither performed by emergency trained professionals nor are necessary emergency equipment or ambulances availed. Patients at Emergency seek high quality care but there is an absence of well-organized facilities and experienced staff, and this is a major problem in emergency care leading to patient dissatisfaction [14].

Acknowledging that there is still high burden of preventable emergency morbidity and mortality, Ethiopia has established emergency care services in hospitals [15]. The emergency patient flow in Ethiopia is stated to be conducted according to the Ethiopian hospital reform implementation guideline [16]. However, due to lack of human and material resources, sustainable funding, medical training, coordination and time-sensitive response, there is still high burden of preventable emergency morbidity and mortality [17,18]. The study is hence intended to fill the gap in the paucity of local evidence regarding quality of care in emergency services which could help concerted effort to improve in the service in the region.

Materials and Methods

Study design, setting and sampling

An institution based cross sectional study was employed. The study was conducted in all 14 public hospitals of Tigrai region, from April-June, 2019. The study used quantitative method of data collection entrenched with observation. The hospitals serve for about 7 million populations in and around the region. The study population was all health professionals working in the emergency department of the hospitals, and the study units were the emergency departments along with the emergency care workers. The sample size for the emergency care workers was calculated using a single population proportion formula and finite population correction factor with the assumptions of point prevalence of 50% of quality of emergency service, since there are no similar researches conducted in Ethiopia, 95% confidence interval and 5% of marginal error, and 10% non-response rate.

$$n = \frac{Z^2{}_{\alpha/2}\, p(1-p)}{\varepsilon^2} * d;\ \rightleftarrows Z_{\alpha/2} = 1.96;\ \alpha = 0.05;\ \text{p=0.5 and 1-p=0.5};\ \varepsilon = 0.05$$

$$n = \frac{(1.96)^2 * 0.5 * 0.5}{(0.05)^2} = 385$$

$$n_f = nN/(n + (N - 1)) = 385*245/(385+(245-1)) = 150$$

$$n_{1f} = 150 + (150*10\%) = 165$$

Where us the total sample size for emergency service clients was 424, 10% non-response rate

$$n_2 = \frac{(1.96)^2*0.5*0.5}{(0.05)^2} = 385$$

$$n_{2f} = 385+(385*10\%) = 424$$

Hence, 16 emergency departments by census, 165 emergency care workers and 424 emergency service clients were included in to the study using simple random sampling.

Operational definition

- **Emergency services:** Healthcare service which treat illnesses and injuries that require an urgent medical response providing definitive care in-hospital
- **Emergency care quality:** The excellence of care in the emergency considering availability of basic resources, access to basic emergency services, client and staff satisfaction, and waiting time to emergency care.
- **Emergency service availability and readiness:** Availability of basic infrastructure, medical equipment, amenities, human resources, essential drugs and protocols.
- **Access to basic emergency services:** Access to basic structural, diagnostic services, supportive services, ward services, infrastructure services.
- **Satisfaction:** The level of contentment of the emergency care clients or staff by the service they get or deliver.
- **Waiting time to emergency care:** the time taken from arrival to the hospital till the client gets the first emergency care.

Data collection and analysis

Structured checklist was used to obtain data on availability and access to basic emergency services, as well as client waiting time to emergency care. Data on staff and patient satisfaction were collected using an interviewer administered pre-tested semi-structured questionnaire. Data collection using the checklist and questionnaire was done by trained nurse data collectors supervised by the principal investigators.

Data were coded, entered and analyzed using SPSS Version 22.0 software. Data cleaning was performed to check for accuracy and consistencies and for missed values and variables. Any logical and consistency error identified during data entry was corrected after revision of the original completed questionnaire. Descriptive statistics was employed to calculate frequencies and proportions to determine the emergency indices.

Ethics approval and consent

All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical clearance and approval were obtained from Tigray health research institute Institutional review board by a reference number of 0055/2010, and an official support letter was obtained from Tigray regional health bureau. Respondents were informed about the purpose of the study, and oral informed consent was obtained from each study participants. Confidentiality of the data was secured by assigning unique code to each of the participants and not used for other purpose.

Results

Emergency service availability and readiness

The overall assessment of emergency service availability and readiness based on availability of basic infrastructure, amenities, human resources, protocols, and essential drugs was only 64%. Basic amenities were assessed based on the availability of the following tracer items in emergency department: improved water source, power (grid or generator), sanitation facilities, and examination room with privacy (auditory and visual), communication equipment, emergency transportation and computer with internet. Among the 14 hospitals; all had electric power and improved water sources, and 10 (71%) had adequate sanitation facilities. However, only 4 (29%) had internet, and 9 (64%) communication equipment (land line telephone) (Figure 1).

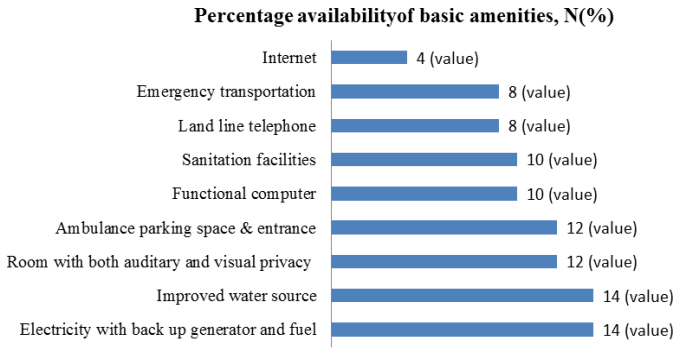

Figure 1: Percentage availability of basic amenities tracer items in emergency department, (N=14) Tigray.

All the hospitals assessed do not have separate examination rooms. Those hospitals with separate operating and isolation rooms were only 6 (43%) (Table 1).

Table 1: Availability and readiness of basic emergency care infrastructure services.

Characteristics	Yes, N (%)	No, N (%)
Examination room	0 (0)	14 (100)
Procedure area	14 (100)	0 (0)
Isolation room	6 (43)	8 (57)
Emergency operating room	6 (43)	8 (57)
Observation and treatment area	12 (86)	2 (14)
Emergency Waiting area for clients	10 (71)	4 (29)
Enough beds, desks, chairs	8 (57)	6 (43)
Nurses/physicians station	11(79)	3(21)
Administration room /Meeting room	7 (50)	7 (50)

With regard to the availability of human resource, the hospitals with specialist doctors, Pharmacists and Laboratory technologists were only 3 (21%), 10 (71%) and 8 (57%), respectively (Figure 2).

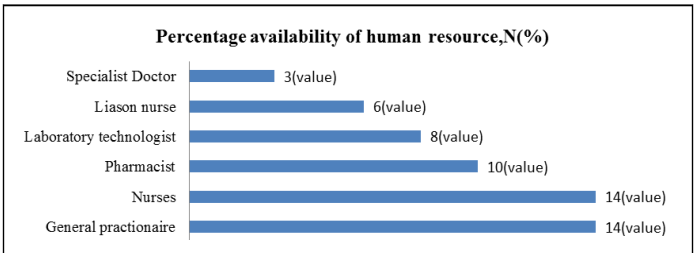

Figure 2: percentage of health care providers working in ED of hospitals, (N=14) Tigray, 2018.

Information exchange among health facilities had not been done in less than one half 6 (43%) of the hospitals. Written information was not provided consistently at discharge in nearly one third 4 (29%) of the hospitals. Pediatric triage protocol was not properly used in 5 (36%) of the hospitals; and obstetric triage protocols was not properly used in 10 (71%) of the hospitals. Regarding the availability of protocols in emergency department, obstetric, pediatric, adult and emergency triage and treatment/ETAT/protocols were available in only 4 (29%), 9 (64%), 10 (71%) and 12 (86%) of the hospitals (Figure 3).

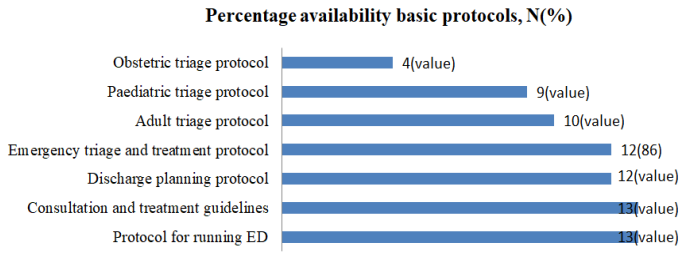

Figure 3: Percentage availability of basic protocols in emergency department (N=14), Tigray.

Availability of essential medicine in emergency department is crucial in order to efficiently and effectively take care of patients. Availability was assessed whether the facilities had tracer drugs in their stock on the day of assessment. Most of the essential drugs were available in the hospitals. However, the least commonly available drugs were Nitroglycerine 0 (0%), Sodium bicarbonate 2 (14%), Suxa-methonium 3 (21%), Anti-snake venom serum 5 (36%) and Mannitol in 6 (43%).

Access to basic emergency services

The overall assessment of access to basic emergency services, based on access to basic structural, medical equipment, supportive services, ward units, and diagnostic services, was only 61.3%. Medical, surgical, pediatric and gyn/obs services were provided in all the hospitals, provision of 24 hours services of laboratory, radiology and pharmacy were limited to 6 (43%), 3 (21%), and 9 (64%) of the hospitals, respectively. Among the 14 hospitals; 12 (86%) had easily accessible emergency department with ambulance entrance. However, only 3 (21%) had access to nurses/physician's stations, 7 (50%) to security and porter services, and 8 (57%) to emergency medical record services (Table 2).

Table 2: Access to basic structural and supportive services for emergency care.

Characteristics	Yes, N (%)	No, N (%)
Access to triage system of screening	10 (71)	4 (29)
Access to efficient patient flow	11 (79)	3 (21)
Easily access to emergency department	12 (86)	2 (14)
Access to 24 hours medical record	8 (57)	6 (43)
Access to cleaning services	14 (100)	0 (0)
Access to security services	8 (57)	6 (43)
Access to porter services	7 (50)	7 (50)
Access to support devices like stretchers	14 (100)	0 (0)
Access to PPE for infection prevention	14 (100)	0 (0)
Access to enough Sterilization equipment	8 (57)	6 (43)

With regard to access to basic emergency diagnostic services on hemoglobin, hematocrit, blood film, blood group and cross match, total cell count, Random Blood Sugar (RBS), urine analysis, stool exam and pregnancy tests, only one half of the hospitals 8 (50%) do have such complete diagnostic services. Regarding to the basic medical equipment (hemodynamic, all the hospitals 14 (100%) had thermometer, stethoscope, tourniquet, IV cannula with infusion set, oxygen, and coach/ stretcher. However, though none of the hospitals were fully equipped, ECG monitor, defibrillator and tracheostomy set were available in only 6 (43%), 8 (57%) and 3 (21%) of the hospitals, respectively. Regarding ambulance service, functional emergency transportation and access to an ambulance service was a challenge in the 5 (36%) of the hospitals. The reported ambulance utilization rate was 89% in the hospitals.

Patient a nd staff satisfaction and waiting time to emergency care

The overall patient satisfaction level among the hospitals attendants was 60%. The total number of patients participated in the health service satisfaction survey were 388. The mean age of the participants were 37 years (SD: 15 years) (Table 3).

Table 3: Patient satisfaction level among general hospitals of Tigrai, 2019.

ED assessment questions	Disagree	Agree
During this visit, nurses treated me with courtesy and respect, explained things in a way I could understand.	27 (7.0)	361 (93.0)
During visit, doctors explained things in a way I could understand, treated me with courtesy and respect.	18 (4.6)	370 (95.4)
The Emergency department and latrine are clean.	103 (26.5)	285 (73.5)
The staff described what the medication is for, the medications possible side effects in a way I could understand.	138(35.6)	250 (64.4)
All the medications I needed are available at drug dispensary and was told what symptoms to look out for after I left	286 (73.7)	102 (26.3)
It is easy for me to find my way around the facility Emergency department	354 (91.2)	34 (8.8)
I would recommend this Emergency department to my friends and family.	386 (99.5)	2 (0.5)
I consider this Emergency visit too expensive.	63 (16.2)	325 (83.8)
	40%	60%

The overall satisfaction level of the staff was 65% in the hospitals. A total of 166 respondents (98% response rate) were taken from the hospitals for the staff satisfaction survey. With regard to the job category of profession of the survey participants, 26 (15.7%) were physicians, 112 (67.5%) were nurses and midwifes, 19 (11.4%) were other health professionals, and 9 (5.4%) were other support staffs. The factors affecting quality of emergency care mentioned by the staff respondents in the hospitals were: Structural, process/ performance, consequential and environmental factors. The average patient waiting time from arrival to receiving clinical care in the hospitals was about 11 minutes.

Discussion

The study revealed that the overall emergency service availability and readiness score was 64%. Availability of basic medical equipment was nearly 50%. Separate emergency examination (0%) and isolation (56.25%) rooms were rarely in use. Similar study conducted in hospitals of five countries indicated less than 65% of all hospitals have basic infrastructure components [19].

Findings from our study also showed that there was inadequacy of essential medicines in the emergency service. However, those essential medicines are intended to be available within the context of functioning health systems at all times, in adequate amounts, in the appropriate dosage, and with assured quality [20,21]. Together with lack of appropriate trainings (50%), scarcity of physicians, pharmacy (29%), and laboratory (43%) professionals were major challenges affecting the human resource of the emergency care. Hence, the laboratory, radiology and pharmacy emergency services were not providing 24 hour's a day. However, numerous studies show evidence of a direct and positive link between the numbers and mix of skills of health workers and health outcomes [22,23].

The study showed that the emergency staff satisfaction score was 65%. This finding was lower than the study conducted in Ram Manohar Lohia Hospital, India 68.5% [24], and higher than the studies conducted in Pakistan 18% [25] and in Sweden 60% [26]. These variations could be attributed to differences in the study settings.

According to the results of this study, the overall access to basic emergency services score was 61%. However, it's known that health services should be accessible directly and permanently with no undue barriers of cost, culture, or geography, and should be close to the people, with a routine point of entry to the service network at primary care levels. The study indicated that rate of ambulance use was 86%. This is higher than the reported 67.3% by a study conducted in India [27].

The study indicated that the emergency patients' satisfaction score was 60%. This was linked with high patient flow, over crowdedness, inadequacy of space and shortage of staffs, which

leads to poor health service delivery to patients and in turn leads to decreased patient satisfaction. This finding is lower than studies conducted in Kenya 82.7%, and Hawassa, Ethiopia 86.7%. In contrary, our finding is higher than the study done in Gondar, Ethiopia 51.7% [28,29]. This variation could be due to differences in the study setting.

This study showed that an average patient waiting time from arrival to receiving emergency care was 11 minutes. The finding is lower than studies conducted in India [30]. Study showed that as waiting time increases, patients are more likely to be dissatisfied with services [31]. Long waiting times indicate that there are insufficient staffs and resources to handle the patient load. Besides, studies indicate that patients admitted to the emergency department during periods of high patient load and crowding died more often than when patients are admitted to the same hospital when the emergency department was less crowded.

The strength of the study lies in that it has reviewed resource availably, observed the structural aspects, and assessed the services on the spot. However, this study has some limitations. Some latent dimensions of emergency care quality might have been unexploited. The patient and staff satisfaction, and patient waiting time surveys might face with social desirability bias.

Conclusion

This study identified a number of challenges and inadequacies in the emergency service. The relatively low scores identified in service availability and readiness, access to basic emergency services, and emergency patients and staff satisfactions indicate the low emergency care quality of hospitals in Tigray. To align with the national and international predetermined targets for emergency care, the health bureau together with program implementers, funders and stakeholders should regularly monitor and address the gaps in service availability, readiness and access compounded with satisfaction of patient and staff. We recommend that in-depth need assessment and evaluation studies be conducted.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors Contributions

Ataklti Gessesse conceived the study idea and performed the analysis. All the authors participated in designing data collection tools, data management and the write-up of the manuscript. The authors agree to be accountable for all aspects of the work related to the integrity of any part of the work. All authors have read and approved the manuscript.

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