Barriers and opportunities of establishing an integrated prehospital emergency response system in North West Ethiopia: a qualitative study

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ABSTRACT

Background Prehospital emergency care helps to reduce mortality and morbidity from time-sensitive conditions. In this study, we summarised the perspectives of various stakeholders on the establishment of a prehospital integrated emergency response system.

Methods We conducted a qualitative study using a key informant interview. We used a purposive sampling technique to select participants from the sector offices based on their proximity to the problem under consideration. We took verbal informed consent from each participant before the interviews. We conducted a thematic content analysis.

Results Twenty-three study participants, working at six sector offices (the zonal health office, University of Gondar, traffic office, fire extinguisher office, the Amhara regional health bureau and the Ethiopian red cross association), were included in this study. Five major themes have emerged. The themes that emerged include participants' views on the importance of prehospital service, barriers and opportunities for establishing the system, and how to start and sustain the system.

Conclusion and recommendation Lack of resources is not the main reason for the lack of prehospital emergency care in the study area rather; lack of commitment, ownership and high turnover of decision-makers were the main reasons for the absence of prehospital care, as viewed by respondents. On the other side, the availability of professionals, training institutions and the fact that emergency care is a shared agenda by different stakeholders were stated as an opportunity to establish the system. With the growing number of injuries and non-communicable diseases, emergency management should get due attention.

INTRODUCTION

Emergency medical services (EMS) refers to out-of-hospital acute medical care and transportation provided to a patient who has life-threatening illness and injuries, as determined by the patient or a medical practitioner (doctor, nurse or paramedic).[1] Prompt care in both prehospital and in-hospital settings minimises the number of people who die from time-sensitive illnesses and lowers the rate of impairment.[2]

Emergency medical care is intended to stabilise patients who have suffered a life-threatening injuries or illness. In contrast to preventative medicine or primary care, emergency medicine focuses on immediate or urgent medical interventions.

It consists of two vital components: medical decision-making and the activities required to avoid unnecessary death or disability from time-critical health problems, regardless of the patient's age, gender, location or condition.[1]

Studies have shown that prompt trauma response improves survival after a traumatic event.[3]

Although health conditions requiring a rapid response are on the rise,[4] EMS is not part of medical care in many low and middle-income countries.[5] Because most of these countries lack an EMS, delays in treatment are prevalent, particularly in rural areas.[6–11]

Many low-income countries have misconceptions about the establishment of out-of-hospital emergency services. One of the common misconceptions is that it is too expensive for low-income countries and should not be a health priority.[5] Other misconceptions include equating emergency care with ambulance transportation, overlooking the importance of community and facility care and presuming that emergency rooms and physicians are the primary sources of acute care. Such a limited perspective undermines the contributions of other fields, skills, and people.[12]

In Sub-Saharan Africa, emergency care got little attention. A previous study has revealed an under-reporting of emergency circumstances as one of the reasons. According to studies in the African region, acute cases presented to clinical areas are seldom documented, with just 1 out of every 10 patients registered. Because of this, an emergency is not regarded as a high-priority health issue.[13 14] Another factor obstructing the visibility of the emergency load in African countries is the lack of an integrated system for treating emergencies, even within a single health facility. Depending on their age, parity and underlying medical issues, emergency cases are handled in separate units of the healthcare facility. As a result, emergency cases will be dispersed, and no consolidated report would be able to indicate the true burden.[15] Some of the hurdles to integrating emergency care into the healthcare system included a lack of uniform regional guidelines at the subdistrict and community level. In addition, a lack of advocacy plans to make emergency care a global health agenda contributes to the under recognition of the issue.[16]

Ethiopia does not have a well-organised national EMS. An effort to establish an EMS was started in 2018 at selected five major cities (Bahirdar, Jimma,

Adama, DireDawa and Mekele), although it has not yet been fully implemented. The present standard of care for prehospital emergency care is limited to ambulance transport, which itself lacks qualified paramedics. Ambulance transport is not available for all emergencies, and it is mostly used for emergency obstetrics. In the study area, commercial vehicles are often used to transport trauma patients and delays in hospital arrival have been identified as one predictor of mortality following road traffic injuries.[17] Ambulances have been provided primarily by the Ethiopian Red Cross Society since 1952,[18] but there are also ambulances provided by the Ministry of Health at the regional, zonal and district levels. However, due to the high prevalence of injuries and obstetric emergencies in the area, the number of available ambulances does not meet the high demand for acute cases. If ambulances are available at all, they only provide transportation; there are no trained professionals or paramedics on hand to provide onsite emergency care. Copassengers or members of the public frequently load victims into cars without knowing how to make a safe transfer, putting them in danger of further injury during the transfer from scene to ambulance or ambulance to HCF (Health Care Facilities). In addition, ambulance is not provided for free when it comes to trauma victims. The user needs to cover cost of fuel and other administrative issues, unlike for obstetric emergencies where it is provided for free.

Even though various sector offices such as healthcare departments, the Ethiopian Red Cross Association, the fire extinguisher department and the police department work on emergencies, there is no coordination between these organisations that allows all services to be available at the same time during an emergency in the country. There is paucity of evidence in the study area about the barriers to establish a prehospital emergency response system from stakeholders' perspective.

The goal of this study was to explore the perspectives of emergency management stakeholders on the barriers and prospects of establishing an integrated prehospital emergency response system.

METHODS
Study design and population
A cross-sectional study design with a qualitative approach was employed to identify barriers and facilitators of establishing an integrated emergency care system in the study area. We used grounded theory, which is a suitable method when new areas are to be investigated.[19]

Study participants
The study population comprised stakeholders working at different sector offices who are proximal to emergency management. We interviewed focal persons working at the zonal health office, hospitals, the University of Gondar, fire extinguisher office, the Ethiopian Red Cross association and the regional health bureau. Participants were selected purposely based on their proximity to the problem under consideration and their responsibility in their respected office.

Data collection
We collected data using a semistructured interview guide, which was developed for each stakeholder based on their role in emergency care. The interview guide was first developed in English and translated to the local language Amharic. Before the data collection process, experts in the field of emergency care and the public health department reviewed the interview guide. The translation and back translation of the interview guide from English to Amharic and back to English was intended to increase the free expression of participants to check the accuracy of the translation, respectively.

We started with general questions, and we gradually progressed to more specific ones. We obtained verbal consent to audio record the interview. Each interview was audiotaped using a high-quality sound recorder. Each interview was conducted by the principal investigator (ZAD), and transcription was done verbatim by the research team. The level of saturation determined the sample size, and the research team did the transcription and translation. Zewditu Abdissa is a PhD student at the University of Gondar who has a clinical background and is an assistant professor of anesthesiology. Kassahun Alemu, Gashaw Andargie and Telake Azale have PhD, and Mensur Osman has MD+. All of the authors are researchers of the University of Gondar with more than 20 years of teaching and research experience. Kassahun Alemu and Gashaw Andargie are professors, while Telake Azale and Mensur Osman are associate professors at the University of Gondar. Zewditu Abdissa is woman, and all others are men. All authors took research methodology. The interviewer had no relation with the participants before the commencement of this study. Some of the participants have prior knowledge about the interviewer, but some had no prior knowledge about the interviewer. Participants were selected purposely based on their proximity to the problem and their responsibilities. The principal investigator and the managers of the sector offices selected participants. Data collection took place at the respective office of participants. Information saturation was reached after interviewing 24 participants. The interviews lasted between 45 min and 65 min. The interviews were conducted between January and June 2021.

Data analysis
The data collection and analysis took place simultaneously to identify the next interview. The interviews, conducted in Amharic, were transcribed by the research team and translated into English. In an inductive procedure, two of the research team coded the interviews. Then, throughout the interview's, related thoughts were coded together. These codes were then arranged, into larger, internally consistent themes. We used Open code software only for coding. The transcribed interview texts were analysed manually using thematic content analysis with an inductive, data-driven approach. Transcripts were read several times, to acquire a better grasp of the data and meaning units. For each meaning unit, explanatory codes were generated, and then codes were assigned to themes. Two researchers performed the coding process, and we solved the differences by discussion. We gave the transcription to the first five participants to ensure whether the transcription was what they provided for trustworthiness. Credibility was checked through triangulation by comparing the responses of different participants.

RESULTS
Twenty-four participants working at six sector offices (Gondar University, Central Gondar zone health office, North Gondar zone health office, west Gondar zonal health office, the Ethiopian Red cross association, the Gondar University Hospital, the Amhara regional health bureau and the fire extinguisher offices) with different responsibilities were approached. Two refused with a response rate of 92% (table 1).

Five major themes were derived from the analysis of the interviews: views of stakeholders on the relevance of integrated

Table 1 Key informant interview profile by department/institution (n=24)

Sector office	Role in the institution	Number
Sector office 1	Top manager	01
Sector office 2	CEO	01
Sector office 2	Emergency professionals	04
Sector office 2	Anaesthesia providers	02
Sector office 2	Blood bank manager	01
Sector office 3	Head	01
Sector office 3	Emergency and critical care focal persons	02
Sector office 4	Head	01
Sector office 4	Emergency and critical care focal person	01
Sector office 5	Driver	01
Sector office 5	Head	01
Sector office 5	Emergency response focal person	01
Sector office 6	Emergency and critical care focal persons	01
Sector office 7	Traffic police	04
Sector office 8	Head	01
Sector office 8	Emergency response focal person	01
Total		24
HCF, Health Care Facilities.		

Table 2 Major themes and sub-themes derived from the data, North West Ethiopia

Themes	Sub-themes
Views of stakeholders on the establishment of the system	It can create a job opportunity for many young people It can save many traumas lives from premature deaths It can fasten hospital response to trauma Care at the scene and on the way to HCF is vital
Challenges to establishing an integrated pre-hospital emergency response	Ambulances related factors Financial constraint Inadequate number of trained emergency professionals Poor infrastructure Lack of ownership and commitment Lack of system High turnover of top managers Lack of coordination between stakeholders Lack of attention by higher officials The referral system is not well established, Lack of awareness about pre hospital care by the community
Opportunities	Availability of primary hospitals, health posts, and ambulances at the district level Availability of trained emergency professionals and many potential young people Prehospital emergency care is Government agenda recently Availability of liaison office at all hospitals Availability of training sectors Availability/expansion of telecom infrastructure Prehospital emergency care is a shared agenda by different stakeholders Initiation of MECCP Availability of Red cross ambulances
How to initiate the system in the country	Requires careful planning and secured resource Can be started as a pilot Can be started with small scale and scaled up Experience sharing from countries with an established prehospital system can help
Sustainability	Establishing a health insurance system Community involvement and mobilisation Cost-sharing by all sectors Especial financial support by the federal government
MECCP, major city emergency and critical care programme.	

prehospital system, challenges for establishing an integrated pre-hospital response system, opportunities to establish the system, how to maintain sustainability and how to initiate such system from the scratch (table 2).

Theme 1: views of stakeholders on the establishment of the system

All participants had the same view of the need for an integrated prehospital emergency response system. They believe that if such a system is established in our country, the number of people who die from time-sensitive issues will be greatly reduced. The presence of such a system can even prevent delays in hospital response for emergency victims. Because one of the components of prehospital care is communicating the condition of the victims with the receiving hospital; hence, early preparation will prevent unnecessary delays once the victim arrived at the receiving hospital. According to our participants, the establishment of such a system could also be an opportunity for many educated unemployed youths in our country. One of our respondents stated as follow:

> There is no doubt on the importance of Prehospital emergency response, it is very vital, we will not be able to make a difference by sending only an ambulance. There are time-sensitive issues like bleeding and airway obstruction. The question is how do we start this service?

Theme 2: challenges to establishing integrated prehospital emergency response

Based on the views of the participants, several factors were pointed out as potential challenges to establishing such a system. Though establishing such a system is resource intensive, resource limitation should not hinder us from having such a system according to our participants. Ambulance-related factors, inadequate number of emergency professionals, poor infrastructure, lack of ownership, poor referral system and community-related factors were some of the subthemes under the theme barrier.

According to participants, the lack of trained personnel is one of the reasons why there is no integrated prehospital emergency medical system.

Lack of commitment and ownership by responsible bodies was also mentioned as a potential challenge. The participants emphasised that lack of attention by higher officials and policy developers contribute to in availability of prehospital emergency care systems. One of our participants stated as below:

> It is well-known that money matters. But the main problem is the lack of ownership at all levels of responsibilities. We can solve many problems by bringing together what we have. But I think the main problem is the lack of decisive leadership

Inefficient management and fear of responsibilities are also mentioned as barriers to establishing an integrated pre-hospital trauma response system. One of our respondents stated as:

> Our leaders at every position do not dare to start something new. He/she says it is difficult or unachievable; without showing an effort. This is a big awkward block

Poor coordination between different stakeholders is another challenge to having such an integrated system. According to participants, emergency response is a shared agenda by stakeholders. These stakeholders include the healthcare system, fire extinguisher office, police offices, red cross association and city

municipality, but no system brings these sectors together as one. A participant from the fire extinguisher office stated as below:

> As a requirement, first aid is within our standard. But we have no trained staff or resources for this work. We have repeatedly asked the city government to link our department with the health department, but we have not been able to get a hearing.

A participant from the fire extinguisher office stated as below:

> As a requirement, first aid is within our standard. But we have no trained manpower or resources for this work. We have repeatedly asked the city government to link our department with the health department, but we have not been able to get a hearing.

High turnover of decision-makers was mentioned as one challenge to establishing an integrated emergency response. Unless accepted by decision-makers, it is challenging to implement such a different approach to providing healthcare. One of our participants stated as below:

> It is difficult for management to accept new practices quickly. It takes time to convince them, on top of this, there is a high turnover of managers in our country. The manager, whom you convinced and accepted your proposal will be changed soon, and the new manager needs another time to understand your plan, this is one of our challenges to implementing new practices.

Theme 3: opportunities to establish an integrated prehospital emergency response system

From the point of view of our participants, there are many good opportunities as there are many challenges. The presence of primary hospitals in each district can be considered a good opportunity. Primary hospitals can serve as a dispatch centre by equipping them with the necessary resources. Though not sufficient, the availability of emergency professionals can be an opportunity to initiate such a system according to participants. The other opportunity mentioned by participants was the due attention given to the issue by the government for the last 3 years. According to participants, emergency and critical care had been established as directorate office at the federal ministry of health and responsibility has been cascaded down to healthcare facilities. Though not yet started, prehospital trauma response is one of the priority agendas, and different activities such as the provision of training to healthcare professionals have been given to healthcare professionals working at healthcare facilities. The initiation of major city emergency and critical care programme at selected five major cities can be used as an opportunity. This programme can be scaled up to different areas of the country. The experience and lessons learnt can be used as an opportunity in the future scale-up of the programme according to participants. Though not properly functioning, each primary hospital and the referral hospital at Gondar town have a liaison department. According to participants, the main gap in the liaison department is poor management. The poor management is due to a lack of qualification and experience. The availability of emergency professionals' training institutions, the telecom infrastructure expansion programme, availability of red cross ambulances are subthemes mentioned under the opportunity to establish an integrated prehospital response system.

Theme 4: how to initiate the system in the country

Another major theme that emerged in this study was how to initiate such a system from scratch. From the point of view of our participants, anything can be started from scratch. But it needs to be carefully planned, so that it will be sustainable. It

requires decision-makers and politicians' commitment because it can require policy direction change. Starting within a certain radius, as a pilot, it can be gradually expanded, according to participants. The other point raised by participants was that it requires the cooperation of concerned stakeholders. It should not be left to the healthcare system or universities working in the area of health only.

> One of the problems I see is that health issues are left to the university and the health bureau. That worries me. Because there must be support from all stakeholders. Out-of-hospital response requires an ambulance and trained ambulance crew. Depending on the situation, fire personnel, electric power authority, and security personnel can be needed. So, it is important to put these three together, in one place.

Learning from other countries' experiences was also suggested on how to initiate such a system by participants. In this study, none of the participants had a chance of visiting countries that had established prehospital emergency response systems.

Theme 5: sustainability issues

How to ensure sustainability once established was the other theme that emerged in this study. According to participants, one of the challenges in such a resource-intensive system is ensuring its continuity. With this regard, participants suggested the following solutions. One of the suggested solutions was to use a community-based health insurance system. Participants believe that such a health cost-sharing system is already in place in some sections of the study area and that it should be expanded. The main challenge in terms of medical bills is the wrong view of society. There is a misconception that the community should be treated free of charge at a public health facility. One of our participants stated as below:

> There is a wrong perception by the community. If you ask the patient or the family for drugs or investigation costs, they say "I don't have any", but if the patient dies, they pay up to 5000 to 6000 birr to take the body, community awareness activities are very vital here.

The other suggestion by participants to sustain the system once established was to allocate special funds by the federal ministry of finance. As such a system demand a huge budget, securing special fund and cooperation between different stakeholders is necessary according to participants. One of our participants stated as:

> To launch this service, the Ministry of Health, the Ministry of Education, and the Ministry of Finance must work together to allocate special funds for the university. Being a teaching hospital and being a medical hospital are two different things.

DISCUSSION

The present study highlighted the potential barriers and the opportunities to establish an integrated prehospital emergency response system. This study highlighted the potential barriers to establishing an integrated prehospital emergency response. Fear of taking responsibility and poor commitment by decision-makers at all levels of management were the repeatedly mentioned barrier. Ethiopian healthcare is mostly delivered through healthcare facilities, which necessitates care seekers visiting healthcare facilities rather than the healthcare system travelling to the community. Because prehospital care is provided outside of the hospital, a shift in healthcare delivery is required to begin prehospital care. This direction change demands extra commitment on the side of decision-makers and demands

tangible evidence to convince the policy developers. On top of this, there is a high turnover of decision-makers. According to our responses, the issue of developing a prehospital emergency response is frequently highlighted by lower level managers and emergency professionals, but convincing decision-makers is difficult, and decision-makers frequently change, making the issue a new topic to discuss.

This finding is consistent with a study conducted in Iran where continuous turnover of managers was mentioned as one barrier for effective prehospital emergency care.[20]

A shortage of trained emergency workers was another impediment to establishing a prehospital emergency response system. Even though training for emergency professionals began in Ethiopia in 2010,[21] the number of qualified experts is insufficient to deliver out-of-hospital emergency services. Working in an emergency room is the most stressful job, and the lack of additional compensation and incentives has forced several emergency physicians to alter their fields of study to a less stressful field, as cited by our participants as the reasons for the shortage of emergency professionals. Because of the high prevalence of injuries and other emergency conditions, the number of emergency admissions at healthcare facilities is increasing, resulting in a strong demand for emergency professionals, limiting emergency care to healthcare institutions. A similar finding was reported by a review from low-income countries, indicating a lack of emergency service providers as a barrier for prehospital care.[22]

Currently, there is a considerable number of mid-level professionals in Ethiopia.[23] These professionals, as well as other young people in the community, can be trained to deliver first aid with the determination of decision-makers. However, neither the expert nor the management has given much attention to the situation. A remarkable example may be found in Iraq and Cambodia, where community members were trained to offer trauma care at mining sites, which lowered mortality from 40% to 9% within 4 years.[24] This demonstrates that low-income countries have not only a scarcity of resources but also an issue with inefficient resource utilisation.

An adequate number of ambulance was cited as one challenge to establish a prehospital emergency response system. Even though ambulances are available in the study area, participants claim that they are not accessible to everyone who needs them. The available ambulances are primarily for maternal care. Another barrier with ambulances is the lack of trained ambulance crews. As a result, ambulances in the study area do not provide more than transportation. Emergency drugs and medical equipment are not carried in ambulances.

This is also due to a lack of coordination; otherwise, community members could be trained on basic life support skills such as safe transfer, bleeding control and airway maintenance. It is also not difficult to obtain emergency drugs and supplies provided by the healthcare system and ambulance providers, such as the Ethiopian Red Cross Association, work together well. Our finding is consistent with previous studies showing ambulances are not accessible for all in need of it, and if at all available, it only provides transportation.[25] This demonstrates that the ambulance does not serve its original goal and does not provide any further benefits to other modes of transportation.

Participants stated poor road quality, telecom infrastructure and poor electricity coverage as potential barriers to establishing a prehospital emergency response. The fact that the majority of the areas in the study area have poor road design and limited network access can be a barrier to implementing a prehospital emergency response system. Although telecom infrastructure is currently on expansion and relatively covering large geographic areas, the electricity coverage is still very low, which in turn affects telecom use effectively. A similar finding was by a previous study.[26]

While there are many challenges to developing prehospital emergency treatment, we found that there are also possible opportunities in our study. The presence of training colleges and institutions is regarded as an opportunity for the establishment of an emergency response system. Furthermore, the fact that the emergency response system is a shared agenda among all stakeholders can be regarded as a golden opportunity for future collaboration.

Another theme that came up in this study was how to get the system up and running for the first time. For the first time, such a system, as is well known, necessitates a large budget. It can be started in a small geographic area and eventually expanded to cover large areas, according to participants. The size of the region to be covered will be determined by the resources we have at our disposal, such as human power and other supplies. The case of Punjab, Pakistan is a good example of this. In Punjab, for the first time, prehospital service began only for the city, and 6 years later, it has been able to serve 35 districts and reach half a million people.[27]

The sustainability issue was also a discussion point by our participants. Emergency medical care is often provided for free due to time constraints and the fact that emergency sufferers, such as car crash victims, are frequently alone. Such services will not be sustainable unless a mechanism is devised in advance to repay all expenses. One way to ensure long-term viability is to engage the community. Because if the community agrees to the establishment of such services, the society can help to assure their long-term viability. One option to ensure long-term viability is to establish a community-based insurance scheme. As a test, several types of health finance are currently implemented in some sections of the country. Once created, expanding such a health financing system can secure its long-term viability. Another method to ensure sustainability, according to participants, is for the government to commit. The Ministry of Health, the Ministry of Finance and the Ministry of Education must all work together to implement this system

What is known about this topic?

⇒ Several studies have shown that emergency medical care in the early hours of injuries can significantly reduce unnecessary deaths. Prehospital emergency care plays a crucial role in this regard. However, most developing countries do not pay attention to this service. This is in contrast to the high burden of injuries and other emergency conditions in developing countries.

What this study adds?

⇒ According to the participants in this study, prehospital emergency care is essential, although it receives little attention. While having a substantial financial backup is required to construct such a system, being poor should not hinder us from establishing one.

Strength and limitation of the study

As a strength, we included views of potential stakeholders responsible for emergency care. One of our limitations is we did not incorporate the perspectives of politicians. The other limitation of the study emanated from the design as all qualitative studies lack generalisability.

CONCLUSION AND RECOMMENDATION

The current study identified potential barriers and opportunities to establish an integrated prehospital emergency response. Based on the findings of this study, the majority of the barriers identified are potentially modifiable with determined leadership. Another finding of this study was that prehospital emergency care is essential and should be established at any cost. With the growing number of injuries and non-communicable diseases, emergency management should get due attention. The formation of a strong prehospital emergency response is critical in this regard.

Further studies should also be conducted that include the views and commitment of politicians.

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