EMERGENCY MEDICAL SERVICES

(HEALTH HIVE)

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Abstract— According to the research article, a variety of difficulties may make it difficult for them to give patients in need prompt and efficient care. Injury is the third most common cause of mortality in India, according to the 2009 National Health Profile of India [1] . This paper provides a thorough analysis of EMS, covering its background, purposes, and difficulties. We explore the tools and methods employed by Emergency medical services (EMS) professionals as well as the various degrees of EMS response, from basic life support to advanced life support. The future of EMS is also taken into account, along with potential effects on the provision of emergency medical treatment from changes in healthcare policy and technological advancements.

I. INTRODUCTION

The two most upsetting tragedies that can occur are the sudden death or permanent disability caused by physical abuse or accident. 2009 saw 1,26,896 people killed while using various forms of transportation on roads, including 1,08,409 men and 18,487 women [2]. The trend makes it clear that despite our ongoing efforts to prevent accidental deaths, their number has been steadily rising over time, and it is time to take stock. Even though the majority of such incidents go unrecorded in the absence of a mandatory standardised nationwide reporting system, these statistics do not accurately reflect the true numbers of people who are injured and maimed every day in accidents.India is a large country with a diverse geographic and demographic make-up.

Individuals in need of emergency medical care or blood transfusions frequently do not receive the prompt and essential assistance they require [4] because they do not have timely access to medical facilities, transportation, and blood banks. The current emergency medical services and blood banks face a number of challenges, including a staffing shortage, inadequate blood storage facilities, a lack of coordination between various organisations, and a lack of public awareness of the importance of blood donation[5]. Even when blood banks are reachable, they might not have the required blood type, which could be fatal and lead to delays. Finding a blood donor in an emergency can also take time and be upsetting for patients and their families[6].

This integrated emergency medical services and online blood bank app must be connected seamlessly between patients, hospitals, and blood banks in order to address these problems. The app must promote public blood donation, speed up patient transportation to hospitals, and provide accurate and timely information about the availability of blood units.The task is to develop an online blood bank and emergency medical services app that can link patients, hospitals, and blood banks while also providing prompt and efficient services in case of a medical emergency. Therefore, rather than examining each component of the Emergency Care or Emergency Medical Service System separately, it is necessary to consider the system as a whole.

2. Literature Review

1. "Trends and causes of maternal mortality in a tertiary care hospital in rural India" by V. Singh et al., published in Indian Journal of Public Health, 2017. This study analysed the medical records of 202 maternal deaths that occurred between 2010 and 2014 in a tertiary care hospital in rural India. Of these, postpartum haemorrhage was the leading cause of death, accounting for 34.7% of all maternal deaths.[7]

2. "Maternal deaths due to obstetric haemorrhage in India: a review" by N. Gupta et al., published in the Journal of Obstetrics and Gynaecology, 2018. This review analysed data from various sources, including the National Family Health Survey, Sample Registration System, and the Indian Maternal Health and Resource Centre. The authors estimated that postpartum haemorrhage accounted for 38% of all maternal deaths in India.[8]

IV. METHODOLOGY

1. DEFINE THE RESEARCH PROBLEM

One potential research topic for emergency ambulance services and blood banking systems is the requirement to increase the accessibility and availability of blood products close to the accident site and the transportation of critically ill or injured patients.

Therefore, the formulation of the research problem could be as follows: What can be done to increase the accessibility of blood supplies close to the accident scene and the need for emergency ambulance services to transport seriously ill or injured patients? This research issue could be addressed using a number of research designs, such as a needs assessment of blood banks and emergency ambulance services. In order to improve patient outcomes in life-threatening situations, the findings of this research may be used to develop evidence-based protocols and guidelines for blood availability during an accident or emergency.

Postpartum haemorrhage (PPH) - According to a study that was published in The Lancet [9], India has one of the highest maternal mortality rates (MMR), with an estimated 35,000 women dying each year during pregnancy or within 42 days of giving birth. The primary cause of maternal mortality in India is postpartum haemorrhage (PPH), which accounts for about one-fourth of all maternal fatalities and is frequently brought on by a lack of blood or insufficient blood transfusion. A different study that was published in the Indian Journal of Community Medicine found that more than half (53.1%) of women who died during or after childbirth did so as a result of PPH.

The study also found that incorrectly recording the cause of death was common, raising the possibility that there may be more maternal deaths in India due to PPH than previously believed. [10]

In addition to these studies, the World Health Organization (WHO) reports that PPH is the primary factor in 27% of all maternal deaths worldwide, with the majority of these deaths occurring in developing countries like India where access to life-saving medical procedures like blood transfusions is frequently hampered. [11]

Global Situation - According to the World Health Organization (WHO), 295,000 women are estimated to have died in 2017 as a result of complications during pregnancy and delivery, with low-income countries being the main cause of these deaths [12]. Postpartum haemorrhage (PPH), which is defined as significant bleeding within 24 hours of giving birth, is one of the leading causes of maternal mortality worldwide (10). PPH is thought to be responsible for about 27% of all maternal deaths globally, according to the WHO [13].

Low-income countries are more likely to have limited access to healthcare and skilled birth attendants, which increases the risk of PPH and maternal mortality. A 2016 study that was published in The Lancet Global Health [14] predicted that maternal mortality from PPH would be 62.5 per 100,000 live births in low-income countries as opposed to 3.5 per 100,000 live births in high-income countries.Another study published in 2017's International Journal of Gynecology and Obstetrics found that PPH could have been treated to prevent nearly 90% of maternal deaths in low-income countries [15]. The importance of increasing access to healthcare services and the availability of life-saving treatments like uterotonics and blood transfusions is highlighted by this finding.Women from low-income countries are disproportionately affected by postpartum haemorrhage, which continues to be a leading cause of maternal death worldwide. Adopting efficient PPH prevention and treatment strategies as well as expanding access to healthcare are crucial for reducing maternal mortality rates across the globe.

2. POSSIBLE APPROACH

A potential solution for the blood banking system and emergency ambulance services could be the development of a centralised system for managing and delivering blood products that is integrated with emergency medical services. The system might contain the following components:

2.1 Management of blood product availability in real-time: To enable users to view the status of blood product availability in real-time, create a centrally managed system. In case supplies run out, the system should have an emergency button that can call an ambulance.

2.2 Develop specialised mobile storage and transportation systems for blood products made for use in ambulances. Mobile blood product storage and transportation. Creating mobile blood product storage facilities is part of this. This would ensure that blood products were accessible and maintained at the proper temperature during transportation.

2.3 Advanced data exchange and communication: By implementing contemporary communication systems, it is possible to enable real-time communication between ambulance crew and medical staff as well as the sharing of pertinent patient data, such as vital signs and medical history. The transfer of care after a patient arrives at the institution would be made simpler and healthcare professionals may be able to make

informed decisions regarding patient care as a result.

3. Previous Models:

i. Services provided by Medulance Healthcare[16] include on-site and on-demand GPS-enabled ambulances, on-site medical rooms, first aid instruction, emergency management technology, and a dedicated emergency helpline for businesses and their employees.

ii. They propose an Integrated Crisis, Medical Services and Clinical Data Framework (IEHMS) to address the shortcomings in the current Malaysian healthcare system. It offers a web-based system that is user-friendly, efficient, and reasonably priced by utilising real-time, mobility, and multimedia environment technology. - http://irep.iium.edu.my/1216/1/An_Efficient_Emergency,_Healthcare,_and_Medical_Information.pdf

iii. A prospective observational study was conducted from November 2015 to January 2016 on a convenience sample of patients in seven Indian states who sought emergency medical care (EMS) for traumatic injuries. Any patient whose primary complaints indicated a traumatic injury was eligible to enrol. The most important outcome was 30-day mortality.

4. Our Model

4.1 Data analysis: Analyze the collected data using machine learning algorithms to find trends and project patient outcomes. This may entail examining the patient's vital statistics, medical history, and the accessibility of blood components.

4.2 Management of blood products: AI algorithms can be used to forecast demand and optimise inventory levels to guarantee that the essential blood products are accessible when required.

4.3 Making use of mobile healthcare technology: While the patient is being transported, the ambulance staff can diagnose and treat the patient. Making treatment recommendations based on the patient's condition may entail performing an analysis of the most recent patient data

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4.4 Use AI to continuously monitor: To increase the effectiveness of the ambulance and blood banking services. This could entail going over patient and healthcare provider feedback, identifying areas that need improvement (like speeding up the app's loading time while receiving feedback), and implementing targeted interventions to improve outcomes.

Block Diagram :

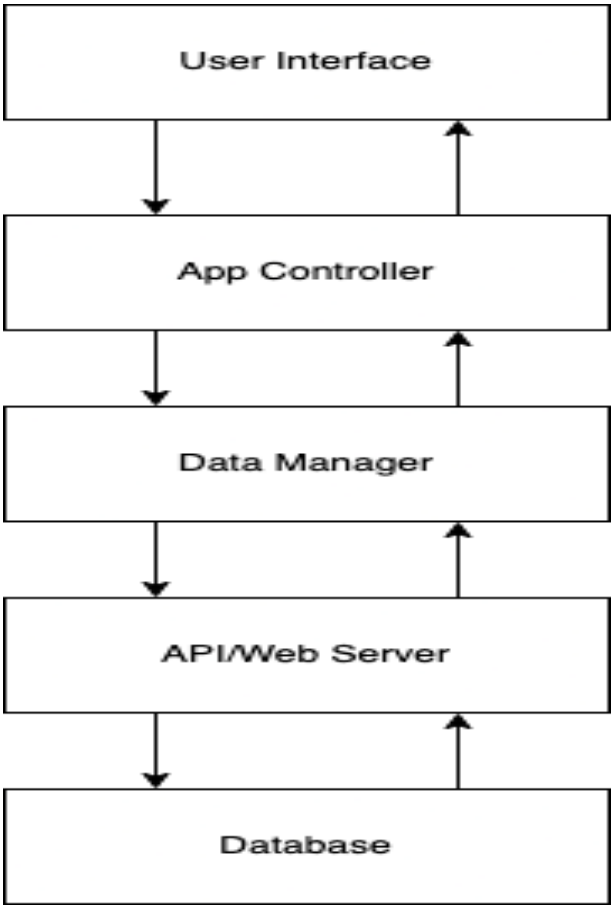


Fig 1:- Block Diagram of our model

User Interface: This section is in charge of presenting the app's user interface to the user, getting their feedback, and displaying data

App Controller: The app controller acts as a link between the user interface and the rest of the app. It accepts requests after processing user input and sends them to the data management.

The **data manager** is in charge of managing all of the user and emergency medical data that the app uses. It communicates with the API and web server to obtain and save data.

Query responses are provided by the **API / Web Server**, which also grants the app access to databases and resources about medicine.

Database: The database component of the programme is where patient information, medical histories, and other emergency medical data are stored and managed.

Design Architecture:

i. User launches the application

ii. Either "Emergency Medical Services" or "Blood Bank" are chosen by the user.

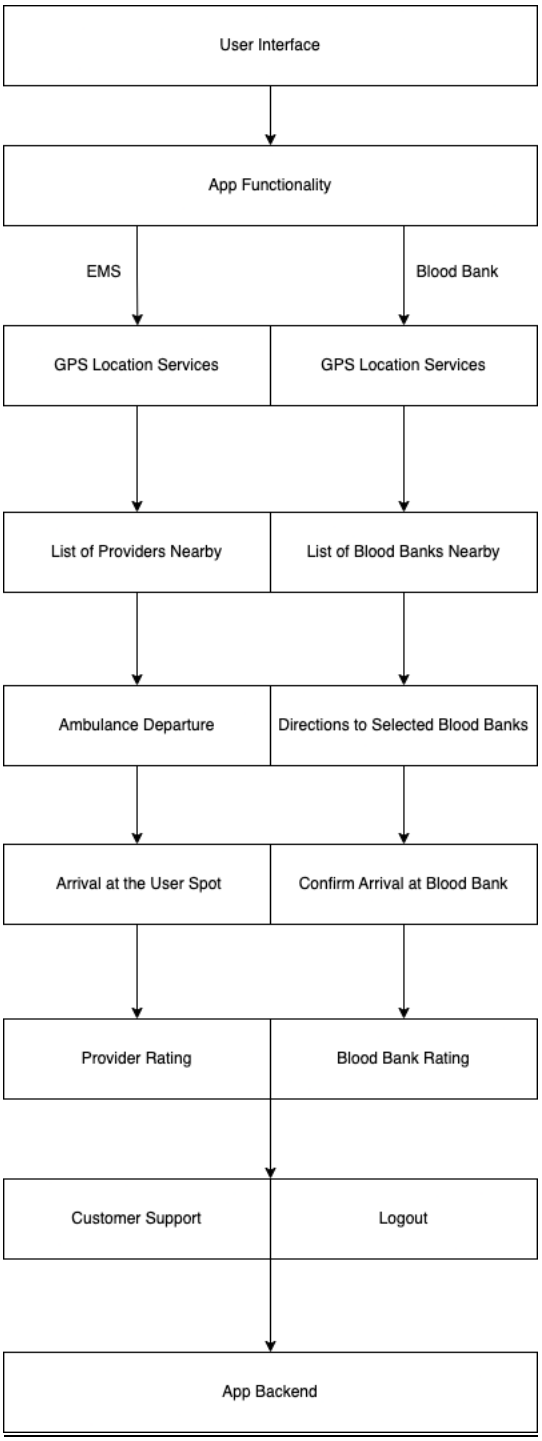
iii. The following happens when the user selects "Emergency Medical Services":
• A mobile application uses GPS to find nearby emergency medical services.
• The user is given a list of emergency medical service providers.
• After selecting a provider, the user receives directions from the app to that provider.
• The user confirms their presence at the service provider.

iv. When the user selects "Blood Bank," they are asked for their location.
Using GPS, an app locates nearby blood banks.
• Clause provides a list of blood banks for the user (c).
• The user picks a blood bank.
• Directions to the selected blood bank are provided by the app.
The user has the option to rate their interaction with the blood bank or supplier.

v. The user can view their previous history using the software.

vi. The user can contact customer service if necessary.

vii. The user can log out of the application.



Conclusion :

In summary, systems for blood banks and emergency ambulances are crucial for preserving life in medical emergencies. These systems depend on well-coordinated efforts from medical

staff, volunteers, and technology to provide prompt and effective patient care.

Emergency ambulance services enable quick patient transportation to healthcare facilities, guaranteeing that patients receive treatment in a timely manner. But blood banks provide a necessary supply of blood products for transfusions, which in many medical emergencies can save lives.

For both systems to operate efficiently, careful planning, management, and ongoing employee training are required. Furthermore, technological advancements have greatly improved the effectiveness and efficiency of the emergency ambulance and blood bank systems.

In case of an emergency, people should be aware of these systems and be able to use them. Healthcare professionals, volunteers, and the general public can work together to ensure that these crucial systems continue to save lives and improve patient outcomes.

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