SYNOPSIS

Topic: Developing a Robust Symptom Mapping Engine: Incorporating Technology in Emergency Healthcare Services

Author: Dr. Priyanshi Rana 1572

A. Introduction

In the Healthcare system, the efficiency and readiness of emergency healthcare services and the pre-hospital emergency healthcare services play a crucial role for delivering timely and effective care for a patient. However, many hospitals face challenges such as a lack of specialized departments, inadequate resources, and fragmented service delivery and pre hospital healthcare services like ambulances lack the knowledge on proper triage and symptom identification. For instance, the absence of essential services like spine surgery in many hospitals can severely limit the quality of care for patients with specific needs (National Health Profile, 2022). Furthermore, the integration of pre-hospital emergency services remains underdeveloped, which affects overall patient outcomes (WHO, 2021). A review of 36 symptom checkers and triage tools in Australia by Hill et al. (22) concluded that triage tools that take into account demographic data were more accurate than their counterparts. The use of AI algorithms also appeared to benefit performance (Front Med, 2022). The development of a symptom mapping engine can significantly enhance hospital readiness by providing a comprehensive overview of available services and identifying gaps in emergency care provision (Smith et al., 2020). By systematically mapping symptoms to required services, hospitals can better allocate resources, improve coordination, and ultimately enhance patient care (Patel et al., 2019). Symptom checkers are becoming increasingly popular, with approximately 13% of the German adult population already having consulted an app for self-diagnosis. Notably, some integrated delivery networks (health care networks) in the United States have begun to incorporate symptom checkers as a service for their members, be it for educational purposes or to improve their members' experience of their patient journey, for example, by guidance on where and how urgently to seek care within the network on the symptom checker's suggestion (J Med Internet Res, 2022) This research aims to explore the current state of emergency healthcare services in Hyderabad, focusing on the importance of knowledge of specialized departments in hospitals and the role of pre-hospital emergency care in improving patient outcomes by symptom identification.

B. Research Question

How can the development of a symptom mapping engine improve the readiness and efficiency of emergency healthcare services in Hyderabad hospitals?

C. Objectives

1. To evaluate the current state of Pre-hospital healthcare services and their knowledge on availability of specialized departments in hospitals.
2. To assess the potential impact of a symptom mapping engine on hospital readiness and patient care.

D. Hypothesis

SYNOPSIS

1. Pre-hospital healthcare services lack sufficient information on specialized departments of hospitals, impacting the overall quality of these services, as the less accuracy an emergency call assistance centre has in identifying the symptoms of a patient the more prone they are to fail in mapping these symptoms to the required department needed for treatment of these patients which results into patient rerouting and unsuccessful lifesaving attempts.
2. Implementing a symptom mapping engine can enhance hospital readiness and improve patient care by effectively mapping symptoms to necessary departments and by giving prior information of these symptoms to the hospitals where the patient is been taken to by emergency vehicle services. This can enhance pre-hospital emergency care to aid the patient/relatives with informative decision making and decreased cases of fatality because of absence of correct treatment.

E. Methodology

This study will employ a mixed-method approach, combining quantitative data collection through a semi-structured questionnaire and qualitative interviews with healthcare professionals.

- **Population and Sample:** The study will focus on 50 hospitals in Hyderabad, selected through purposive sampling to ensure a diverse representation of hospital types with compulsory 24/7 ER attachment to them (e.g., multi-speciality, super specialty & single speciality hospitals).

- **Data Collection:** Data will be collected over a three-month period through direct visits to hospitals. The semi-structured questionnaire will gather information on the availability of specialized departments, current emergency services, and hospital readiness. Qualitative interviews will explore the perspectives of healthcare professionals on the challenges and benefits of implementing a symptom mapping engine.

- **Data Analysis:** Quantitative data will be analysed using descriptive statistics to identify patterns and gaps in service provision. Qualitative data will be analysed thematically to extract key insights and recommendations.

- **Ethical Considerations:** Ethical approval will be obtained from the relevant institutional review board. Informed consent will be obtained from all participants, ensuring confidentiality and the right to withdraw from the study at any time.

SYNOPSIS

F. Study Design

The study design will include both cross-sectional surveys and in-depth interviews to provide a comprehensive understanding of the current state of emergency healthcare services and the potential impact of a symptom mapping engine.

G. Study Population

The study population will include hospital administrators, emergency department staff, and healthcare professionals in Hyderabad from hospitals that provide 24/7 emergency services and are accredited with standards like NABH or JCI.

H. Duration of the Study

The study will be conducted over a period of three months, including data collection, analysis, and reporting.

I. Operational Definitions

1. **Symptom Mapping Engine:** A digital tool that maps patient symptoms to the required healthcare services and specialized departments, facilitating better resource allocation and coordination.
2. **Hospital Readiness:** The ability of hospitals to provide timely and effective emergency care, including the availability of necessary services and resources.
3. **Pre-Hospital Emergency Care:** Services provided before a patient reaches the hospital, including ambulance services, first aid, and emergency medical response.

J. Data Analysis

Data analysis will involve both quantitative and qualitative methods:

- **Quantitative Analysis:** Descriptive statistics will be used to summarize the availability of specialized departments and emergency services. Chi-square tests will be conducted to examine the association between hospital type and service availability.
- **Qualitative Analysis:** Thematic analysis will be used to identify key themes from interviews, providing insights into the challenges and benefits of a symptom mapping engine.

K. Ethical Considerations

This study will adhere to ethical guidelines for research, including obtaining informed consent from all participants, ensuring confidentiality, and maintaining data integrity. The study will be conducted in compliance with the ethical standards of the Helsinki Declaration.

References

SYNOPSIS

- Jones, A., Brown, P., & Smith, L. (2020). Reducing administrative errors in healthcare. *Journal of Healthcare Management*, 44(3), 150-162.
- National Health Profile. (2022). Ministry of Health and Family Welfare, Government of India.
- Patel, V., Agarwal, R., & Sharma, N. (2019). The integration of electronic medical records in hospital systems. *Journal of Medical Systems*, 42(3), 45-52.
- Smith, J., Lee, M., & Patel, R. (2020). Impact of technology on healthcare efficiency. *Journal of Healthcare Management*, 45(2), 123-135.
- World Health Organization. (2021). The role of digital health in global health systems. Geneva: WHO Press.
- Smith, J. A., & Brown, L. P. (2018). "Emergency Care in Hospitals: Challenges and Solutions." Journal of Emergency Medicine, 45(2), 123-130.
- Kumar, R., & Patel, S. (2019). "AI in Healthcare: Transforming Emergency Response." International Journal of Healthcare Technology, 12(4), 345-356.
- Singh, A., & Gupta, M. (2020). "The Role of Technology in Enhancing Emergency Medical Services." Healthcare Technology Today, 6(1), 78-89.
- Rao, S., & Sharma, P. (2017). "Hospital Emergency Departments: A Comprehensive Review." Indian Journal of Medical Research, 146(5), 567-575.
- Verma, S., & Choudhary, A. (2019). "AI-Based Symptom Checkers: A New Frontier in Medical Diagnostics." Journal of Artificial Intelligence Research, 28(3), 290-301.
- Jio Health. (2021). "Emergency Healthcare Services in India: A Study of Jio Health." Healthcare Management Review, 15(2), 112-125.
- Practo. (2022). "Innovations in Healthcare: The Practo Model." Journal of Health Services Research & Policy, 27(4), 345-358.
- Patel, R., & Singh, H. (2018). "Emergency Medical Systems in India: Current Status and Future Directions." Indian Journal of Emergency Medicine, 14(2), 210-218.
- Johnson, D. B., & Roberts, K. (2020). "Telemedicine in Emergency Care: Benefits and Challenges." Journal of Telemedicine and Telecare, 26(7), 383-390.
- Pairon A, Philips H, Verhoeven V. A scoping review on the use and usefulness of online symptom checkers and triage systems: How to proceed? Front Med (Lausanne). 2023 Jan 6;9:1040926. doi: 10.3389/fmed.2022.1040926. PMID: 36687416; PMCID: PMC9853165.
- Schmieding ML, Kopka M, Schmidt K, Schulz-Niethammer S, Balzer F, Feufel MA. Triage Accuracy of Symptom Checker Apps: 5-Year Follow-up Evaluation. J Med Internet Res. 2022 May 10;24(5):e31810. doi: 10.2196/31810. PMID: 35536633; PMCID: PMC9131144.