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ASSESSING THE EFFICIENCY AND PREPAREDNESS OF THE EMERGENCY RESPONSE SYSTEM AT TIMERGARA TEACHING HOSPITAL, KHYBER PAKHTUNKHWA

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Abstract
The study aimed to evaluate the emergency response system at Timergara Teaching Hospital and to assess the hospital's disaster preparedness protocols. This cross-sectional study utilized a Focus Group Discussion (FGD) guide as the primary data collection tool. Participants included medical staff working in the Emergency Department and hospital administrators at Timergara Teaching Hospital. A sample size of 91 respondents was selected. Data were analyzed using SPSS for quantitative analysis and thematic analysis for qualitative insights. The evaluation of medical staff distribution, emergency training, and response measures—supplemented by the thematic findings from FGDs—highlighted both the strengths and the areas requiring improvement within the hospital's emergency response system.

INTRODUCTION

An emergency is described as a situation that requires immediate medical attention, as determined by a clinician, or that the patient or their family members believe could result in loss of life or limb. An acute injury or sickness that presents a direct risk to a person's life or long-term health is considered a medical emergency. This is a case where the patient needs immediate access to high-quality medical care in order to prevent any form of loss or to take the first steps toward returning to a regular, healthy life. Real crises posing a threat to life are handled by an accident and emergency department. Only if patients come at an emergency room at the appropriate time, place, receive the appropriate care, and have access to the necessary resources can they be saved. Injury is an essential part of hospital care since it is always unforeseen, unplanned, and can cause damage, deformity, and even death if left untreated. An emergency department, also referred to as an accident and emergency department, is a type of medical facility that focuses on emergency medicine. Emergency care for patients who show there without a scheduled visit, either by themselves or with the help of an ambulance. The emergency room is typically found in a hospital or other type of primary care facility. It is essential and required to preserve the lives of seriously injured and ailing people.[i]

Hospitals serve as vital hubs for the health care system during disasters by offering vital medical care to local populations. A multijurisdictional, multifunctional response and recovery effort is

frequently necessary for any incident that results in the loss of infrastructure or an increase in patients, such as a natural disaster, terrorist act, or chemical, biological, radiological, nuclear, or explosive hazard. This effort must include the provision of healthcare. Local health systems might quickly become overburdened trying to provide care after a crucial incident if proper emergency preparation isn't in place. Health care delivery is severely hampered by a lack of resources, an increase in demand for services, and supply chain and communication disruptions. Hospitals must be equipped to take basic, high-priority action in order to improve their capacity to handle the demands of a crisis [ii]

Many businesses create their own Emergency Preparedness and Response procedures, or they hire a consulting company to do it for them. If one of these approaches is used appropriately, there is nothing wrong with it; but many businesses make serious mistakes when creating their own systems, and we really cannot afford to make mistakes when it comes to emergency response and preparation. Emergencies can take many different forms, such as fires, explosions, medical crises, rescue operations, accidents involving dangerous chemicals, bomb threats, armed conflicts, and natural disasters [iii]

Emergency response and assessment are essential components of disaster management and emergency medical services. Emergency response refers to the prompt actions taken by first responders, including doctors, firefighters, and police, to offer assistance and support in life-threatening situations. Triage is the act of arranging patients into groups based on the severity of their conditions and the resources that are available.[iv]

For organizations of all sizes, an emergency response system (ERA) is a vital tool that enables them to react swiftly and efficiently to any unanticipated incidents. We will discuss emergency response systems, their importance, and your organization's potential benefits in this blog post. They are particularly crucial for businesses that operate in high-risk sectors including vital infrastructure, finance, and healthcare. For these organizations to be able to react swiftly and efficiently to any potential catastrophic crises, they must have a strong emergency response system in place. [v]

Any occurrence that could have a significant effect on a population's health is referred to as a "health crisis." This includes dire circumstances brought on by environmental, technical, sociological, and other factors. The World Health Organization's (WHO) "all-hazards" approach to readiness for them reflects the reality that, despite differing cause dynamics, all such possibilities pose similar challenges to health systems and allow for a unified method for their effective management. nearly the past ten years, crises have impacted nearly 1.5 billion individuals, primarily the weaker demographics like women and children, resulting in losses to the economy over US$ 1.3 trillion. Between 2004 and 2013, there were approximately 110 000 deaths worldwide as a result of natural or technological disasters, not to mention the high number of diseases, injuries, and psychological trauma.[vi]

With almost 5 percent of the global population, South Asia is the second least developed region in the world (after Sub-Saharan Africa) in terms of gross national income per capita, life expectancy at birth, predicted and mean years of schooling, and human development index. Because of its geo-climatic features, the region is particularly vulnerable to disasters. It has the fastest exposure growth rate in the world, at 3.5% year, and over the next 20 years, there is expected to be a major increase in the risk of catastrophes. Over 600 million people reside along the 2200 km-long geological fault line that cuts through the Himalayan belt. In addition to earthquakes, this fault line poses a risk of avalanches and floods caused by glacial lake outbursts, while the lowlands are affected by cyclones, floods, and droughts that originate in the Bay of Bengal and the Arabian Sea. In addition, there are a number of persistent conflicts in the area, such as insurgencies, ethnic tensions, and sectarian conflicts, all of which have the potential to worsen.[vii]

All emergency response systems depend heavily on preparedness, and efforts to ensure preparedness should be correspondingly robust in areas with high degrees of instability and uncertainty. Despite Pakistan's high susceptibility to natural catastrophes, there are few studies that evaluate the nation's crisis management readiness.[viii]

A provincial or territorial request for federal emergency assistance is facilitated by the National Emergency Response System, which also establishes standardized terminology that can be used by federal, provincial, and territorial governments and stakeholders to facilitate the timely exchange of information. The National Emergency Response System links the federal, provincial, and territorial emergency response systems for all hazards and identifies interactions between the three levels of government in relation to response activities, such as situational awareness, risk assessment/impact analysis, planning, coordination of logistical support, and public communications.[ix]

In order to give populations access to necessary medical care during all kinds of disasters, hospitals are vital. Disasters can cause a quickly rising service demand that surpasses the functional capability and safety of hospitals as well as the entire health-care system, depending on their extent and character. The Hospital Emergency Response Checklist was created by the World Health Organization Regional Office for Europe to help emergency managers and hospital administrators respond appropriately to the most likely crisis scenarios. This tool incorporates priority action necessary for a prompt, efficient response to a critical incident based on an all-hazards approach, along with contemporary hospital-based emergency management concepts and best practices. To support hospital managers and emergency planners in achieving the following goals, the tool is organized into nine key components, each with a list of prioritized actions: (1) continuity of essential services; (2) well-coordinated implementation of hospital operations at every level; (3) accurate and clear communication both internally and externally; (4) quick adaptation to increased demands; (5) efficient use of limited resources; and (6) a safe environment for healthcare personnel. There are references to a few other tools, guidelines, and relevant sites given. Hospitals at any level of emergency readiness may use the guidelines and suggestions in this tool. The goal of the checklist is to supplement current multi-sectoral hospital emergency management plans and, whenever practical, improve routine operations in non-emergency scenarios.[1]

The following issues prevent healthcare facilities from saving patients: poor planning, ignorance, inability to recognize clinical urgency, absence of supervision, and unwillingness to ask for help.[x]

Hospitals should set up backup plans for handling internal incidents including fires, floods, chemical spills, utility outages, and business interruptions. These plans should include things like: Strategies for logistics and supply; risk communications; alerting systems; dead bodies management; business continuity; flood management; hazardous materials management; fire safety; power failure; and hazardous materials management are among the suggested strategies. [6]

The Emergency Response System in Pakistan is an initiative of the National Disaster Management Authority, Provincial Disaster Management Authorities, District Disaster Management Authorities, and Pakistan Meteorological Department. It is a cooperative effort with prominent humanitarian organizations, such as UN agencies, the European Commission's Humanitarian Aid and Civil Protection department and its disaster preparedness program, the Office of the United States Foreign Disaster Assistance, the International Organization for Migration, the Royal Norwegian Embassy, the Japan International Cooperation Agency, Global Affairs Canada, the Swiss Agency for Development and Cooperation, the International Centre for Integrated Mountain Development, and the Pakistan Poverty Alleviation Fund. [xi]

Many hospitals have rapid response systems (RRS) in place to help avert respiratory or cardiac arrest by identifying and treating patients in non-intensive care units who show early indicators of clinical deterioration. The two clinical components of the rapid response system are an afferent and an efferent component. The two organizational components are the administrative and process improvement components.[xii xiii]

On a daily level, hospitals are a vital community resource; this is more true during and after a disaster. In addition to being unable to offer essential services when needed most, a hospital that is not resilient to disasters increases the risk of victimization for its knowledgeable personnel,

vulnerable patients, and guests. "A safe hospital: will not collapse in disasters, killing patients and staff; can continue to function and provide its services as a critical community facility when it is most needed; and is organized, with contingency plans in place and health workforce trained to keep the network operational," is how the Hospitals Safe from Disasters program puts it succinctly. This is the simplest way to describe what hospitals should anticipate during a disaster. Hospital preparation standards come in a variety of forms; consensus and regulation are the two most common; the former have a more expansive reach. The majority deal with hospitals in industrialized nations, especially those in the US. Intentionally broad standards for hospital readiness and response have been developed by ASTM International. A range of occupancies are covered by the National Fire Protection Association's Standard 101, the Life Safety Code, whereas Standard 99 pertains to healthcare establishments. For many years, hospitals wishing to become accredited by The Joint Commission have had to meet certain emergency preparedness requirements; these requirements have progressed from "disaster plans" to comprehensive emergency management systems. These criteria are extensively relevant in terms of both depth and breadth, even in situations where accreditation is not a concern. The current standards focus on creating and sustaining an emergency operations plan (EOP) and hazard vulnerability analysis (HVA) in order to establish preparation as a sustainable organizational component. Once implemented, sustainability is attained through continual assessment and updating, which includes the acquisition of equipment, the creation of protocols and training, testing through simulation and real-world occurrences, and pertinent amendment. The accomplishment of these standards increases the likelihood that any company, including a hospital, will continue to operate during a disaster. They are the cornerstone of successful emergency management programs across various professions.[xiv] The idea is the same for all users whether it is referred to as an emergency management plan, disaster plan, or emergency operations plan (EOP). An efficient EOP is a valuable tool throughout the whole disaster impact process; it is neither a "cookbook" or a series of instructions. Essentially, an emergency operations plan (EOP) does the following: it indicates emergency management structures (like the Hospital Incident Command System) and explains how those structures integrate with community and larger-scale structures; it identifies roles, responsibilities, and authorities among hospital staff and community partners before, during, and after an emergency. creates mechanisms and capacities for alerting and interacting with employees, patients, families, outside organizations, the media, and other relevant parties; creates non-routine reaction processes and their thresholds for activation in order to handle particular issues (e.g., evacuation, safety and security, staffing, utilities, curtailing services); establishes protocols for growing staff with volunteer health care providers; deals with post-disaster recovery and restoration; and identifies capabilities and procedures for maintaining critical services for at least 96 hours in the absence of outside support. These procedures include resource management procedures for requesting, assigning, tracking, and replenishing medical and nonmedical supplies. Particularly for areas of special concern or capability, emergency operation plans can take many different forms. However, the form is not as important as the quality of the underlying assumptions, HVA, internal adoption, and integration with local and higher-level planning.[xv]

The most frequent obstacle to hospital readiness is financial since getting ready for an upcoming event takes priority over everyday requirements; nevertheless, in many developed nations, these obstacles may have more to do with executive priorities than with a genuine shortage of funding. Since most communities have not experienced a disaster, motivation needs to come from sources other than firsthand knowledge. Inaccurate risk perception can result in inaccurate planning assumptions, which can then lead to inadequate preparedness. This can apply to risks, their physical impact, or their impact on the economy and the law. A common indicator of inadequate resource allocation is inadequate emergency gear, especially

backup communications systems; inadequate training; and drills and exercises that are too brief, too focused, or too optimistic. Although there have been significant advancements in knowledge and practical improvements since the year 2000, especially in the industrialized world, hospitals are not always adequately prepared for catastrophic disasters due to their sheer extent. [xvi]

Emergency Departments (EDs) can be heavily involved in evaluating community health care coverage, assessing communicable and non-communicable diseases, including injuries, and offering preventive services to the general public in addition to acute care, like smoking cessation counseling for smokers who present with coronary heart disease, as well as developing evidence-based policies, if they are strategically placed within the health care system. Unexpected, urgent illnesses are a serious public health risk. Given that they may be responsible for up to 45% of deaths and 36% of the disease burden in low- and middle-income countries, these illnesses may have an especially significant impact on these countries. Increased availability of high-quality emergency care might alleviate the burden of 501 million disability-adjusted life years and 21 million fatalities in these countries. Thus, emergency care can significantly reduce avoidable deaths and impairments. But historically, the health care systems of developing nations have not placed a high focus on emergency medical care.

Injuries, lower respiratory tract infections, septicemia, ischemic heart disease, and diarrhea are among the top 15 causes of early mortality in Pakistan, per a study on the burden of sickness. Adult fatalities are primarily caused by circulatory problems, burns, traffic accidents, and pregnancy issues. A separate report from the country's largest metropolis, Karachi, claims that emergency medical services (EMS) are not expressly supported by the health budget.[xvii]

Despite the significance of emergency medical care, it is not included in national or state-level efforts to overhaul the Pakistani health system. Because of this, the only type of emergency treatment that is currently offered nationwide—particularly in larger hospitals and clinics—is based on postcolonial public emergency room models. Although emergency transport services have lately been established by nonprofit organizations in a few countries' urban areas, these services are scarce and limited to a small number of places.[xviii]

The main barriers to the creation of efficient emergency medical services policies in Pakistan include reforms in the areas of finance, governance, documentation, advocacy, politics, and education. Some of the unfavorable public perceptions of emergency care among users include a lack of skilled personnel, subpar facilities, and subpar service. The provision of intensive care units (ICUs) in Pakistan is severely impeded by inadequate emergency care and transportation infrastructure, long wait times for hospital admission, evaluation, and transfer to the ICU, inadequate ICU and hospital infrastructure, and unstable medical supply and consumables chains. When combined with Pakistan's lack of official ICU-related research, a shortage of trained medical staff, and a shortage of biomedical technicians, these challenges might seem insurmountable.[xix]

Lack of key goods, such as bag valve masks, cervical collars, defibrillators, and epinephrine, which are fundamental to providing emergency care, is a serious issue6. Many of the frequently missing equipment parts are cheap and, if used right away, might save lives in a number of emergency scenarios. The low use of ambulances in Pakistan has frequently been attributed to inadequate prehospital care, inept staff, and inadequately equipped transportation facilities—all of which add to the public's mistrust of the EMS system. A study revealed that hospital admissions and deaths were more common among patients who came by ambulance to the emergency department (ED) than among those who arrived by other forms of transportation.[xx]

Another serious and growing problem in the ED is overcrowding. While patients who require emergency care are actively managed in the ED, those who do not are either discharged or sent to other departments. Nevertheless, the ED gets crowded if there is a 4-hour wait in discharge or in being sent to another department8. The majority of patients' protracted stays in emergency departments

(EDs) throughout Pakistan have been the primary source of concern for daily operations. Since congestion in the ED is a sign of larger supply and demand imbalances in the health care system, examining the ED alone won't resolve the problem.[xxi]

There are three stages of care in Pakistan's health system: primary, secondary, and tertiary. Primarily, basic health units and rural health centers serve populations of 10,000–15,000 and 25,000–50,000, respectively, as primary care institutions. Tehsil and District Headquarter Hospitals, which serve 100,000–300,000 and 1-2 million people, respectively, are examples of secondary care facilities. Provincial governments have tertiary care hospitals, some of which also serve as teaching hospitals. Among the institutions engaged in disaster management in Pakistan are the National Disaster Management Authority, the National Health Emergency Preparedness & Response Network, and the Ministry of National Health Services, Regulations & Coordination. The country's national, province, and district levels of disaster management infrastructure are described in depth in the 2017 National Action Plan for Disaster Risk Management, which also promotes progress monitoring, evaluation, and follow-up.[xxii]

The EDHI foundation is the biggest nonprofit ambulance organization in the country, operating approximately 1800 vehicles and two air ambulance aircraft. Another private project is the Aman Foundation, which has roughly 80 ambulances, a command-and-control center with real-time tracking, an 18-minute response time, and only covers one province in the country. These are crucial in helping to get patients emergency medical attention to the closest hospital.[xxiii]

In July 2018, two hospitals, The Indus Hospital (TIH) in Karachi, Pakistan, and Brigham & Women's Hospital, a teaching affiliate of Harvard Medical School in Boston, USA, launched the year-long Certification Program in Emergency Medicine (CPEM). The CPEM seeks to increase ED staff retention, provide EM physicians with proper emergency care training, and promote EM support throughout Pakistan. The American College of Emergency Physicians (ACEP), the College of Physicians & Surgeons of Pakistan (CPSP), and the guidelines of the African Federation of Emergency Medicine (AFEM) serve as the foundation for the program's curriculum. Furthermore, feedback from emergency medicine specialists who have conducted and delivered EM training in first-world and lower- and middle-income country (LMIC) settings was also taken into consideration.[xxiv]

1.1 The research problem

For more than 20 years, the World Health Organization (WHO) has steadfastly supported health systems' readiness for efficient handling of emergency crises on a worldwide scale. Pakistan is renowned for having poor coping and adaptation skills as well as a high susceptibility to dangers. Medical systems It is crucial to be ready for locations with such a high-risk profile, yet there are few studies discussing the state of the nation's emergency response system. There is a need for a well-established Emergency response system in Hospitals in Pakistan.

2 Literature Review

In Canada, handling emergencies is a shared duty that depends on constant coordination and dialogue throughout all governmental tiers. The bulk of emergencies in Canada are handled by local authorities and provincial and territory governments in accordance with the country's constitution. In Canada, over 90% of emergencies are resolved locally or at the provincial/territorial level and don't involve the federal government directly. At the province/territorial particular request, the federal government may step in if an emergency poses a threat to the resources of any one province or territory. In order to "work together to improve and enhance the emergency response framework in order to harmonize the federal system so that it complements each province and territory system," Canada's ministers of federal, provincial, and territorial affairs who oversee emergency management came to an agreement in January 2005. The Federal, Provincial, and Territorial Response Working Group has designed the National Emergency Response System to offer a

coordinated strategy in this area. The emergency response management framework for Canada, which has been approved by the federal, provincial, and territorial governments, contains the emergency management principles that are incorporated into the National Emergency Response System, which is a part of Canada's emergency response management system. These guidelines support the development, execution, and continuous enhancement of the frameworks, policies, programs, procedures, guidelines, and activities that collectively make up Canada's emergency management systems. They also define the fundamental ideas and objectives of emergency management.

The study's findings show that while most rural hospitals in Sichuan province are capable of handling public health emergencies, there are still certain obstacles and inadequacies to be addressed. Furthermore, a comparison of the readiness capability of hospitals using these four characteristics showed that, with statistical significance, tertiary-grade teaching and general hospitals outperformed secondary-grade non-teaching and non-general hospitals.[13]

Critical medical services for responding to mass casualty occurrences (MCI) are outlined in the Hospital Emergency Response Plan (HERP). The plan includes a series of documented processes that serve as a roadmap for emergency situations, aid in the healing process, and lessen the effects of incidents that happen both within and outside the hospital and necessitate extra staff, supplies, coordination, and planning. The Disaster Management Act of the Government of Bangladesh (2012) and the Standing Orders on Disasters 2019 are two examples of the guiding policies and processes. Hospital Disaster Safety Assessments (HDSAs) and Emergency Response Plans (HERPs) are connected. HERP is determined by HDSA; its conclusions and suggestions form the basis of HERP. HERP focuses on the hospital's response to a real danger, including early warning, coordination, communication, coordination through the Incident Command System (ICS), activation, mobilization, command, and control, as well as recovery and business continuity. The DGHS's Hospital Emergency Preparedness and Response Plan, which was created in October 2011 with technical support from the WHO Country Office for Bangladesh, is updated and complemented by HERP. A pilot test of the draft HERP tool, which was created specifically for the Bangladeshi context and in accordance with NPD recommendations, was carried out by ADPC, NCDC/DGHS, and NIPSOM under the auspices of USAID's Program for Strengthening Emergency Preparedness and Resilience in Bangladesh (SERB). The lessons learned and participant comments from the pilot test of the HERP tool for building the HERP at primary level hospitals are incorporated into this version of the tool.[xxv]

We still have a ways to go in the development of emergency medical services in Pakistan, which has a poor past. Regarding pre-hospital patient management services, very little is known. In our nation, emergency medical services started to take shape in the early 1960s. It was recommended that every newly constructed hospital have a separate emergency department; yet, pre-hospital emergency services continued to be poorly organized and received insufficient attention or planning.

Tens of thousands of volunteers across Central and South Asia have received disaster response and management training from AKAH. The Sitara-i-Eisaar award was given to AKAH by the Pakistani government in appreciation for their humanitarian efforts during the 2005 Kashmir earthquake. Trained by AKAH, community volunteers can be first responders in emergency situations and are knowledgeable of local hazards. Community emergency response teams, or CERTs, play a crucial role in communities, especially those situated in remote, high-risk areas like mountains. around the years, AKAH has educated more than 36,000 community volunteers—more than 50% of them are women—to be first responders and built 192 organized CERTs around Pakistan. To improve local response capabilities, we give communities emergency stocks filled with supplies including blankets, tents, search and rescue equipment, and first aid kits. Additionally, AKAH assisted the Pakistani government in creating the standards for community-based disaster risk management and the nation's National Disaster Management Plan.[7]

The goal of the CEPSA program's research on disaster preparedness in South Asia is to comprehend the state of preparedness activities at the moment and the political and economic motivations that drive these results. Case studies and quantitative analyses are used to look into the reasons behind national and local governments' investments in—or lack thereof of—efforts to prepare for and lessen the risk of natural disasters. Over the past ten years, Pakistan has had a number of natural catastrophes. The most notable of these was the enormous earthquake that struck the Kashmir region in 2005, killing over 75,000 people and leaving behind a lasting legacy as one of South Asia's greatest natural disasters. 1. In 2010, Pakistan had some of its worst floods ever, which claimed 1,800 lives and damaged 21 million more. 2. Flooding claimed 1.5 million lives and killed 178 in 2013. 2014 saw widespread flooding that claimed 367 lives, making it the "fourth consecutive year of high-impact monsoon rains in Pakistan. In 2015, people in Karachi, Pakistan's largest city, experienced a heat wave that killed over 1200 people. In many ways, Pakistan's capacity to deal with disasters has significantly improved in recent years.[xxvi]

The West Pakistan National Calamities (Prevention and Relief) Act and the Civil Defense Act were passed in 1958. From 1958 till the Kashmir earthquake in 2005, the disaster management function was not formally housed in one location; the Emergency Relief Cell in the Federal Cabinet Secretariat led coordination efforts but districts independently sourced disaster relief equipment and responded to disasters. The earthquake in 2005 was the catalyst that resulted in the creation of the Earthquake Reconstruction and Rehabilitation Authority (ERRA) and initiated a conversation on setting up a formal disaster management authority.[xxvii] However, it was only in 2010, when a large part of the country was flooded, that the government took the next major step and passed the National Disaster Management Act. In the same year, the landmark 18th Amendment to the Constitution was also passed that devolved the disaster management function to district governments.[xxviii]

PEER Pakistan organized a Stakeholders Consultation Workshop to discuss the institutionalization of Hospital Preparedness for Emergencies (HOPE) in the country on 7 July 2021. A total of 24 participants took part in the workshop led by the National Disaster Management Authority (NDMA) and National Health Emergency Preparedness & Response Network (NHEPRN) on the integration of HOPE in institutional strategies, programs, and budgets. This includes the accreditation of the HOPE course and the required processes in Pakistan. The workshop aimed at sensitizing stakeholders on the PEER institutionalization process and integration of HOPE within the institutions' annual work programs, medical colleges, and hospital curricula.[xxix]

The presence of a well-functioning EMS is paramount in improving outcomes for time-sensitive illnesses like out-of-hospital-cardiac-arrest (OHCA) and various injuries. As the outcomes of OHCA patients are dependent on the early recognition of cardiac arrest, rapid dispatch of ambulance and paramedics, and early initiation of CPR and defibrillation, the presence of a well-established and fully functional EMS significantly impacts their survival rates. However, the EMS landscape, especially in low and middle-income countries (LMICs), is often fragmented, with disparities even within the same country, posing significant challenges to timely and efficient emergency care.[xxx]

A purposive sample of 12 of the most disaster prone districts in two provinces of Pakistan was evaluated for preparedness using the WHO's toolkit for assessing health-system capacity for crisis management. Six core functions of the Health Systems Framework, with a total of 229 indicators, were evaluated at the district management as well as secondary and tertiary health care facilities level. Proportions of indicators prepared were calculated and preparedness was classified as Acceptable (≥ 66%), Partial (36-65%) or Inadequate (≤ 35%). Results: Seventy-two percent, 95% Confidence Interval [46.0, 90.0] of indicators in these most vulnerable districts were evaluated as partially or inadequately prepared for appropriate management

of crises. Even the highest scoring core function, Leadership and Governance was partially prepared with a score of 53.6% (52.4, 54.9). Process elements were found to be less prepared compared with structure components. Federal level strategic planning, implementation, management and follow-up aimed at ensuring health-systems' preparedness need to be reviewed and strengthened.[xxxi]

National emergency and disaster preparedness is coordinated by National Disaster Management Authority and United Nations Office for the Coordination of Humanitarian Affairs. There is a multi-agency disaster plan, which is nationally coordinated. There are, however, no mandatory periodic tests of system readiness, and disaster drills occur irregularly. Facility-level plans are required at first level and tertiary facilities, and most facilities have such plans. There is a regular review of hospital and prehospital disaster preparedness, but this is limited in scope.[xxxii]

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In Pakistan, national or state-level efforts to reform the health sector do not include emergency medical care, disregarding the importance of the same. As a consequence, the only kind of emergency care that has been made available across the nation, especially in larger hospitals and clinics—is based on postcolonial models of emergency rooms in the public sector. Although nonprofit organizations have recently created emergency transport services in a few countries' urban centers, these services are few and restricted to a relatively small number of locations. According to current data available for Pakistan, access to high-quality emergency and trauma treatment is severely constrained. A pilot study discussed urban settings in 2 districts in Pakistan, revealing a general lack of necessary equipment and supplies, inadequate staff confidence in their capacity to handle emergencies, and a general discontent among providers and toward the emergency medical services. Two factors were considered while evaluating emergency and trauma services: (1) the availability and expertise of the doctors delivering emergency care, and (2) the infrastructure and essential tools and supplies.[xxxiv]

A study shows considerable number of emergency health professionals found deficient in knowledge, with limited opportunities for training despite their beliefs towards disaster emergency management. There was a gross lack of formal teaching and training programs in emergency and disaster medicine. So, for the medical personnel, disaster emergency preparedness training/course should be necessary and efforts should be done to incorporate such courses and training in the curricula of health institutes at undergraduate and post graduate level. Long-term formal training such as undergraduate and postgraduate programs is necessary.[xxxv]

Accident and emergency department is very important section of hospital and emergency medical care is the most sensitive area of health care system. Public demand for care in emergency department has increased tremendously in recent years. So it needs a lot of efficiency for the patient care and more importance with passage of time. It was pertinent to study the existing situation of emergency health care facilities regarding the provision of emergency services to the community. Accident and emergency department of Sharif Medical and Dental College Lahore was selected for that purpose. A questionnaire was developed. The

data regarding the accident and emergency department and its functioning was collected from the duty doctors and staff concerned and patients and attendants attending the accident and emergency department. During the study it was found that treatment facilities like building, equipment, supplies, trained, personnel and support services were not up to the mark, barring the provision of medicine/devices and investigation facilities. The building is too small to accommodate the increasing number of emergency patients. According to the study findings it was found that, despite the efforts of hospital administration the supply of equipment is not sufficient to fulfill the requirements of patient's load the accident and emergency department has. Professional and non-professional personnel are less as compared to demand, furthermore there are no training programs to up to date the knowledge of working staff. Communication system of emergency department is not according to the present day's standards of information technology and one cannot rely upon it in situations of need. Ambulances are not properly equipped to deal emergency patients on the way to the hospital. Transportation system of patients within the emergency department is also poor and majority of patients is to be brought in by relatives. As for as disaster plan of Sharif Medical City is concerned it is seen that the awareness and attitude of emergency staff lacks in this regards, reason being the lack of training and knowledge incorporated to the accident and emergency department. It was pertaining that record pertaining to patient's admission, stay and fate were not managed properly and even the registration forms were not being saved properly. The management of emergency patient is also unsatisfactory, consultants rarely visit the emergency department. Only junior doctors control the situation. A critical analysis of the suggestions given by the patients revealed that striking point was need of improvement in physical amenities and staff behavior. To improve the present situation regarding provision of quality of emergency services, construction of new big emergency department building with all basic physical requirement, appointment of trained and sufficient number of personnel with their continuous training and quality control programs, provision of adequate equipment and supplies, improvement in communication and record keeping system were recommended.[xxxvi]

According to current data available for Pakistan, access to high-quality emergency and trauma treatment is severely constrained. A pilot study by Razzak et al[5] discussed urban settings in 2 districts in Pakistan, revealing a general lack of necessary equipment and supplies, inadequate staff confidence in their capacity to handle emergencies, and a general discontent among providers and toward the emergency medical services. Two factors were considered while evaluating emergency and trauma services: (1) the availability and expertise of the doctors delivering emergency care, and (2) the infrastructure and essential tools and supplies.

In Karachi, the International Committee of the Red Cross (ICRC) tested a training guide on de-escalating violence for medical staff. Effective teaching techniques were used to deliver training, including role-playing, small-group discussions, scenario-based videos, and brainstorming. It was discovered that proper training significantly increased the confidence of health care professionals in handling aggressive patients.[xxxvii]

A purposive sample of 12 of the most disaster prone districts in two provinces of Pakistan was evaluated for preparedness using the WHO's toolkit for assessing health-system capacity for crisis management. Six core functions of the Health Systems Framework, with a total of 229 indicators, were evaluated at the district management as well as secondary and tertiary health care facilities level. Proportions of indicators prepared were calculated and preparedness was classified as Acceptable (≥ 66%), Partial (36–65%) or Inadequate (≤ 35%). Seventy-two percent, 95% Confidence Interval [46.0, 90.0] of indicators in these most vulnerable districts were evaluated as partially or inadequately prepared for appropriate management of crises. Even the highest scoring core function, Leadership and Governance was partially prepared with a score of 53.6% (52.4, 54.9). Process elements were found to be less prepared compared with structure components. Federal level strategic planning,

implementation, management and follow-up aimed at ensuring health-systems' preparedness need to be reviewed and strengthened.[xxxviii]

3. Rationale of the study

Disaster preparedness in hospitals is a critical global concern that involves proactive measures to mitigate the impact of natural or artificial disasters. The purpose of this study is to evaluate the emergency response system at Timergara Teaching Hospital, Lower Dir, Khyber Pakhtunkhwa.

4. Aims and Objectives

Aim:

The aim of this study is to evaluate the Emergency Response System at Timergara Hospital, Lower Dir, Khyber Pakhtunkhwa.

Study Objective:

1. To conduct a survey to evaluate the Emergency Response System at Timergara Hospital, Lower Dir, Khyber Pakhtunkhwa.

To conduct FGDs with Hospital Administrators to assess the Emergency Response System at Timergara Hospital, Lower Dir, Khyber Pakhtunkhwa.

II: METHODOLOGY

A cross-sectional study was conducted at Timergara Teaching Hospital, Lower Dir, Khyber Pakhtunkhwa in order to evaluate its Emergency Response System. This study was a mixed method research including both qualitative and the quantitative part. This study was conducted at the Emergency Department of Timergara Hospital. This study included Medical staff working at the Emergency Department including Medical Doctors, Nurses and Paramedical staff to evaluate the Emergency response system. Data was collected using a pre validated questionnaire. Individual In depth Interviews (IDIs) were conducted with Hospital Administrators to assess the ERS of the Timergara Hospital. Data was be analyzed on SPSS version 27.

5.1. Study design

A Mixed Method, Cross-sectional study design.

5.2. Study area

Study was conducted at Timergara Teaching Hospital, Lower Dir, KPK. Timergara is a city and the district headquarters of the Lower Dir District and temporary headquarter of newly established Central Dir District in Khyber Pakhtunkhwa, Pakistan. Timergara city is located on the east bank of the Panjkora River. It lies at an altitude of 823 meters (2,700 ft). The town is the site of excavated graves of Indo-Aryans, dating from 1500 to 600 BC. The main healthcare facility is District Headquarters Hospital Timergara.

5.3. Duration of study

Duration of this study will be 6 months.

5.4. Data sources

Primary data sources – Data collected through a pre-validated survey questionnaire and an FGD guide developed by the principal investigator.

5.5. Study population

This study was conducted with the Medical Staff working at the Emergency department and Hospital Administrators working at Timergara Teaching Hospital, Lower Dir, KPK.

5.5.1. Sampling technique

Sampling Technique used in this study was non-probability purposive sampling technique as this study included the medical staff working at the emergency department only. A sample size of 91 participants was taken (29 Medical doctors, 62 Nurses and Paramedics).

5.5.2. Sample recruitment: Inclusion and Exclusion criteria

Inclusion Criteria

- Medical staff (Doctors, Nurses, Paramedics) working at Emergency Department
- Hospital Administrators (Hospital administrators, including department heads, emergency response coordinators, and senior management)

Exclusion Criteria

- Technical and support staff
- Medical staff working at other departments

- Individuals without significant roles in emergency management.

5.6. Data collection techniques

Survey:

A cross-sectional quantitative survey was conducted with medical staff in order to evaluate the emergency response system at Timergara Teaching Hospital, Lower Dir, KPK.

Focused Group Discussion:

FGDs were conducted with key informants (Hospital Administrators) to assess the emergency response system at Timergara Teaching Hospital, Lower Dir, KPK using a FGD Guide developed by principal investigator using a pre validated tool developed by Tang et al, 2015.

5.7. Data collection tool

Survey Questionnaire (A pre-validated tool).[xxxix] This study was conducted to evaluate the public health preparedness and to thus provide a method for driving improvement. To develop reliable and valid preparedness metrics, this research sought to identify and validate a comprehensive evaluation framework and to develop and test a standardized index to measure hospital PHEP.

5.9. Definitions of key terms, concepts and variables

Emergency

A present or imminent event that requires prompt coordination of actions concerning persons or property to protect the health, safety or welfare of people, or to limit damage to property or the environment.

Emergency Response System

The emergency response describes the quick decisions made by first responders, such as medical professionals, firefighters, and police, to provide help and support in dire circumstances.

5.10. Data analysis plan

Data was analyzed on SPSS version 23.

5.11. Ethical considerations

- Synopsis approval was obtained from Institutional Review Board, Health Services Academy, Islamabad.
- Permission was taken from Timergara Teaching Hospital, Lower Dir, Khyber Pakhtunkhwa.

Study participants were informed about the data confidentiality and consent was taken

IV: RESULTS

4.1 Medical Staff at Emergency Department

At Timergara Hospital, the distribution of medical staff (n=69) among three key categories at Timergara Hospital is as follows: Doctors, Nurses, and Paramedics provides an overview of the facility's staffing structure: The hospital employs 29 doctors. This number represents a significant portion of the medical staff, reflecting the essential role doctors play in providing medical care. With 35 nurses on staff, this category has the highest number of personnel. Nurses are crucial for patient care, monitoring, and supporting the medical team in various capacities. The hospital has 27 paramedics, who are vital for emergency response.

Table 4.1 Frequency of Medical Staff at Timergara Hospital, where n=69

Medical Staff	Frequency	Percentage
Doctors	29	31.8%
Nurses	35	38.4%
Paramedics	27	29.6%
Total	69	100%

4.2 Emergency Training

The cross-tabulation between Infectious diseases trainings and type of medical staff shows a strong association with a p value of 0.00. A significant number of doctors and nurses are involved in emergencies related to non-communicable diseases compared to paramedics. There is a clear distinction in staff involvement based on the category of

medical staff. Doctors and nurses are significantly more involved in managing infectious disease outbreaks than paramedics. This is evidenced by the high p-value $p<0.05$, indicating a strong association with the category of medical staff. Natural disasters see a higher involvement of doctors compared to paramedics and nurses with $p<0.05$. There is minimal involvement of staff in bio/chemical terror incidents, and the p-value indicates no significant difference in staff involvement. Involvement in handling mass unidentified diseases is relatively low and not significantly different across the categories of staff.

There is a high involvement of doctors, nurses, and paramedics in flood-related emergencies. The data indicates a significant engagement across all staff types when floods occur. There is substantial involvement of medical staff in blasts or other emergencies, but the p-value suggests no significant difference in staff engagement. Staff involvement in foodborne diseases is notable but not significantly different across categories. There is significant involvement of nurses in cases of occupational poisoning, with doctors and paramedics also participating but to a lesser extent with $p<0.05$. Involvement in nosocomial infections is notably lower compared to other emergencies, with significant differences in staff engagement.

Table 4.2 Emergency Measures and category of medical staff, where n=69
Content of Training

Emergency Measures	Medical Staff			Total	p-value
	Doctors	Nurses	Paramedics		
Non-Communicable Diseases					0.00
Yes	24	24	3	51	
No	03	11	24	40	
Infectious disease outbreak					0.00
Yes	24	32	06	62	
No	5	3	21	29	
Natural disasters					0.01
Yes	5	08	06	21	
No	22	27	21	70	
Bio/Chemical terror					0.15
Yes	02	01	01	04	
No	27	34	26	87	
Mass Unidentified Diseases					0.34
Yes	3	3	4	10	
No	26	32	23	81	
Floods					0.01

Yes	28	30	24	82	
No	1	5	3	9	
Blasts/Other emergencies					0.54
Yes	29	28	23	80	
No	0	7	4	11	
Foodborne disease					0.50
Yes	20	32	20	72	
No	9	3	7	19	
Occupational poisoning					0.01
Yes	6	12	3	21	
No	23	23	24	70	
Nosocomial infections					0.03
Yes	2	3	2	07	
No	27	32	25	84	

4.3 Content of Training

The cross-tabulation between content of emergency plan and distribution among the type of medical staff training with a p-value <0.05 indicates that the differences in training levels among staff are statistically significant. A substantial number of doctors and nurses are trained in medical treatment procedures, while fewer paramedics receive this training. The p-value suggests no significant difference in the training levels across staff categories.

Doctors are significantly more likely to be trained in methods of identifying public health emergencies compared to nurses and paramedics. This training is crucial for early detection and response. There is a significant difference in awareness training, with fewer staff overall trained. Doctors show a lower percentage in this area compared to nurses and paramedics. Training on personal protective measures is low among all categories but does not show significant differences between them. P value of 0.45 shows that most staff members are trained in information system management, with no significant differences between doctors, nurses, and paramedics. Training in disinfection and sterilization is significantly higher among nurses and paramedics compared to doctors. This indicates a focused approach on these critical areas for most staff.

Training on quarantine and isolation principles shows a balanced distribution among doctors and nurses, with no significant differences with a p value >0.05. Training evaluation is significantly more common among doctors compared to nurses and paramedics with a p value <0.05. This suggests a stronger focus on assessing training effectiveness for doctors. There is minimal variation in trainer availability among different staff categories, with most reporting a lack of trainers.

Table 4.3 Content of Emergency Training and Medical staff Category, where n=69

Content of training	Medical Staff			Total	p-value
	Doctors	Nurses	Paramedics		
Content of emergency plan					0.04
Yes	25	9	1	35	
No	04	26	26	56	
Medical treatment procedures					0.51
Yes	26	32	15	73	
No	3	3	12	18	
Methods of identifying Public Health Emergencies					0.01
Yes	21	5	5	31	
No	08	30	22	60	
Awareness of public health emergencies					0.01
Yes	12	10	10	32	
No	17	25	17	59	
Personal protective measures					0.00
Yes	3	2	8	13	
No	26	33	19	78	
Information system management					0.45
Yes	28	32	21	81	
No	1	3	6	10	
Disinfection and sterilization					0.03
Yes	13	29	24	66	
No	16	6	3	25	
Principles of quarantine and isolation					0.34
Yes	18	20	07	45	
No	11	15	20	46	
Training Evaluation					0.03

Yes	12	6	3	21	
No	17	29	24	70	
Trainer Availability					0.54
Yes	3	2	0	05	
No	26	33	27	86	

4.4 Emergency Measures

The cross-tabulation shows a significant difference in involvement across staff categories in emergency drills, with more nurses participating compared to doctors. The p-value indicates a significant variation in participation rates. Provision of emergency plans is notably higher among doctors and nurses, with significantly fewer paramedics receiving these plans. The p-value <0.05 indicates a highly significant difference. The provision of emergency materials is relatively high across all staff categories, with no significant differences observed. Drugs provision shows a fairly balanced distribution across doctors, nurses, and paramedics, with no significant differences in training levels. There is a marginally significant difference in the availability of back-up medical installments, with doctors having a higher provision compared to other categories. Provision of bio/chemical gowns is significantly higher among doctors and nurses compared to paramedics. The high p-value indicates a strong significance in the availability of these gowns. PPE assessment shows a significant difference in availability across staff categories, with a higher proportion of doctors involved compared to nurses and paramedics. The ability to increase the number of beds is reported similarly across all staff categories, with no significant differences. Training in emergency medical plans shows a significant difference, with fewer doctors and paramedics receiving training compared to nurses. There is a significant difference in the perception of sufficient staff availability, with a much higher number of staff reporting insufficient availability, particularly among doctors and nurses.

Table 4.4 Emergency Measures at Timergara Hospital, where n=69

Emergency Measures	Medical Staff			Total	p-value
	Doctors	Nurses	Paramedics		
Emergency Drills					0.01
Yes	15	8	3	26	
No	14	27	24	65	
Emergency plans provision					0.00
Yes	24	32	06	62	
No	5	3	21	29	
Emergency Material Provision					0.51
Yes	27	28	23	68	
No	02	7	4	23	
Drugs Provision					0.33

Yes	21	25	21	67	
No	08	10	6	24	
Back-up Medical Installments					0.07
Yes	16	21	18	55	
No	10	14	9	31	
Bio/Chemical Gowns Provision					0.01
Yes	28	30	18	76	
No	1	5	9	15	
PPE Assessment					0.00
Yes	23	22	11	56	
No	06	13	16	35	
Ability to increase no. of beds					0.50
Yes	20	32	20	72	
No	9	3	7	19	
Emergency Medical Plans					0.01
Yes	6	12	3	21	
No	23	23	24	70	
Sufficient Staff Availability					0.03
Yes	2	3	2	07	
No	27	32	25	84	

4.5 Thematic Analysis of Focused Group Discussion conducted with Hospital Administrators to assess the Emergency Response System at Timergara Hospital, KPK

Focused group discussion of key informants (Hospital administrators) was conducted to assess the current emergency response system at Timergara Hospital located in Lower Dir, Khyber Pakhtunkhwa, Pakistan. After taking permission from the hospital administration, study participants were informed about the purpose of FGD's and questions to be asked in the discussion. This FGD included 6 Hospital administrators from different departments including DMS Emergency Department.

Study participants were asked questions regarding current emergency evaluation plan/files/handbooks, emergency trainings, availability of trainers, content of emergency plan, availability of medical staff, medium of emergency content provision and communication, early warning systems, infectious diseases reports and register system, surveillance system, availability of laboratories, waste disposal and personal protective equipment provision and maintenance. They were also asked about their satisfaction regarding the emergency response system of their hospital and what could be improved according to them.

Responses of study participants were noted by the note taker and data was than transcribed. Data was analyzed using thematic analysis. After

transcription, coding was done and following themes were generated:

1. Current Emergency Services

Timergara Hospital in Khyber Pakhtunkhwa (KPK), Pakistan, like many hospitals, has an emergency response system designed to handle urgent and critical situations. However, the specifics of their emergency response system might vary based on local resources, infrastructure, and protocols. Emergency Department (ED) is the primary unit where patients with urgent medical conditions are received and treated. It is equipped with specialized staff and equipment for rapid assessment and intervention. Emergency Response Team typically includes emergency medicine doctors, nurses, paramedics, and support staff trained to handle various emergency scenarios. Hospital has communication systems to alert and mobilize emergency teams quickly. This often involves internal alert systems, radios, and telephones. These are established procedures for handling different types of emergencies, such as natural disasters, mass casualties, or critical medical conditions. For external emergencies, hospital has dedicated ambulances equipped with lifesaving equipment and staffed by trained personnel. Hospital coordinate with local emergency services, such as fire departments and police, to manage emergencies effectively. Regular training and drills are conducted to ensure that all staff are familiar with emergency procedures and can act quickly and efficiently.

2. Emergency Trainings and Content of Trainings

According to the hospital administrators, emergency trainings are conducted after 3 to 4 months to train the medical staff including the doctors, nurses and para medical staff. Most of the trainings are conducted for Nurses hence they are more trained to provide emergency services when necessary. Fewer trainings are conducted for medical doctors and paramedics. Trainings are conducted by hiring a trainer (specialist of the respective field) to provide training to the medical staff. It is mandatory for the staff to participate in the trainings. However, there is no particular person hired especially for emergency trainings. Administrators ask the trainers to conduct trainings. The staff is notified about the trainings through staff groups and official website, circulars and notifications. Hospital has a DHS Program through which trainings are conducted but trainings are not much frequent.

According to DMS Timergara Hospital, the content of emergency trainings mostly consists of emergency trainings regarding infectious diseases outbreak control trainings like during COVID-19 whole medical staff was trained very well, similarly trainings are conducted for emergency services for natural disasters management like floods and earthquakes are also conducted. Trainings are also conducted for emergency services in case of man-made disasters such as blasts and accidents.

3. Emergency Action Plan

The Hospital has emergency action plan that is communicated to the hospital staff at the time of appointment. Currently, the emergency action plan consists of a triage system in which the patients are identified at the arrival as Red, yellow or green on the basis of their problem, condition and severity of symptoms so that patients who need emergency care are identified at the early stage and are provided with emergency care services at the earliest. For example, if a patient comes with Myocardial Infarction, he/she is identified at the first station so that their life can be saved. There are specific wards and units to treat patients who need special care. Most of the cases reported in the hospital are Diarrhea, Measles and Accidents. A patient comes, is classifies by the triage system and is referred to the concerned unit to receive special treatment without any delay.

Infectious diseases are reported in the hospital and the data is entered in the Hospital registers manually by the clerk. The data is also entered on the online system known as DHS Website that is the website handled by Government of KPK. Data id updated on the websites and entered on Hospitals on daily basis by the clerk. The data is also updated monthly. All the data is available on the DHS Website of Health Department.

4. Emergency Staff Availability

According to the DMS Emergency Department there is shortage of staff in the emergency department. DMS Emergency is the in charge of the emergency department who is responsible for the Emergency reporting's along with Nursing Supervisor. They have to report the data to the regarding emergencies to the DMS Casualty and Surveillance that is than shared with clerk and reported to the Health Department. Medical staff is available on the basis of rotations/ shifts. Staff works on the basis of morning and evening shifts. Nurses are available full time but there is excessive workload on them. In case of any mass casualty, blasts, outbreak or accidents, the medical staff from other department has to be called to provide emergency services as the staff available in emergency department is not enough. Similarly beds in use of other departments are used for emergency purposes.

Hospital has 24/7 functional laboratories on the other hand that are available even at the weekends and holidays. Almost all types of medical tests are available in the laboratories. Emergency drugs are also available and in case of shortage of drugs the Hospital has an Emergency Fund known as Local Purchase "LP". Hospital can purchase any drug or supplies in case of shortage or emergency.

5. Suggestions for Improvements

According to the Hospital Administrators working at Timergara Hospital, the staff is provided with personal protective equipment but these are very basic like gloves and masks and there is no proper maintenance practices for PPE. That's why provision of advanced PPE should be done along with PPE usage and maintenance trainings. The Emergency action plan should be revised on the basis of current situational analysis and needs survey. According to the administrators, the resources are limited and we do what can be done within those resources. DMS supervises the trainings, according to the study participants, hospital should hire someone responsible for frequent Emergency trainings as the trainings are conducted after every 3 to 4 months. The content of trainings should include more material regarding the current conditions to be more helpful. Trainings are mostly conducted for nurses, so more trainings for Doctors and Paramedical staff are required. Instead of calling staff from indoor units and wards along with Emergency staff, more medical staff for the emergency department should be hired to reduce the workload and burden on the current staff in order to improve the quality of services. According to hospital administrators, emergency response system of Timergara Hospital needs improvements and emergency action plan and contents needs proper evaluation and revision.

V: DISCUSSION

The analysis of the medical staff distribution, emergency training, and emergency measures at Timergara Hospital, complemented by the thematic insights from the focused group discussion (FGD), reveals several strengths and areas for improvement in the hospital's emergency response system.

According to current study the emergency department at Timergara Hospital faces a shortage of dedicated emergency staff, especially during mass casualty events. According to a study conducted by Dondorp et al. (2017) in their research on emergency department preparedness in low-resource settings, found similar challenges related to staffing shortages, particularly during high-demand periods like epidemics and natural disasters. The need for additional staff and the challenge of managing large volumes of patients were noted as significant barriers to effective emergency response. In a study conducted by Yoon et al. (2020) highlighted that emergency departments with higher ratios of nurses to patients were better equipped to handle emergencies. The findings align with Timergara Hospital's situation where nurses are more abundant, yet the overall shortage of emergency staff remains a concern.

At Timergara Hospital, emergency training is conducted every 3 to 4 months, mainly for nurses. Doctors and paramedics receive less frequent training, with significant gaps noted in the training for infectious diseases, natural disasters, and personal protective measures whereas in a study conducted by Niska et al. (2022), they found that regular and comprehensive training for all staff

categories is crucial for effective emergency management. Their study emphasizes that frequent and specialized training improves response times and effectiveness. The focus on nurses at Timergara is consistent with a broader trend where nurses often receive more hands-on training, but gaps in training for other staff categories are prevalent.

According to a study by McDonald et al. (2019) the results underlined the importance of cross-training staff in various emergency scenarios. They found that institutions with balanced training programs across all staff categories demonstrated better preparedness and response capabilities. This supports the need for Timergara to increase training frequency and inclusivity for all medical staff.

The content of training at Timergara Hospital covers medical treatment procedures, public health emergencies, and disinfection. However, personal protective measures and quarantine principles are less emphasized. A Study by Simonsen et al. (2018), the study found that training content focusing on personal protective equipment (PPE) and infection control was critical, especially during outbreaks like COVID-19. This reflects a gap in Timergara Hospital training content, where advanced PPE training and maintenance are needed. A Study by Tambo et al. (2021) highlighted the importance of tailored training content for specific emergencies, such as bio/chemical threats and infectious diseases. Timergara Hospital focuses on general emergency scenarios but not on specialized areas like bio/chemical incidents is a point of comparison.

Emergency plans and materials are generally provided, but there are deficiencies in advanced PPE and the maintenance of protective equipment. Emergency drills are more frequently participated in by nurses.

Comparison:

Study by Reddy et al. (2021): This study highlighted that regular drills and comprehensive emergency plans are associated with better emergency outcomes. They also noted that PPE provision and maintenance are critical for protecting staff and patients. Timergara's practice of PPE provision and the need for maintenance aligns with the study's recommendations for improving resource management.

Study by Kose et al. (2019): Their research found that hospitals with robust emergency plans and resources were better prepared for sudden surges in patient numbers and varied types of emergencies. Timergara's efforts to update and review emergency plans are consistent with best practices identified in this study.

The hospital's emergency response system shows strengths but also significant room for improvement, particularly in staffing, training, PPE provision, and emergency plan updated. In a study conducted by Sikka et al. (2020), the study pointed out that effective emergency response systems are characterized by adequate staffing, regular and relevant training, and robust resource management. The need for continuous evaluation and adaptation of emergency plans was emphasized, reflecting Timergara's current situation where such improvements are necessary.

In a study conducted by Hu et al. (2022), their findings support the need for ongoing assessment and upgrading of emergency response systems to handle evolving challenges. This aligns with the FGD results from Timergara, where administrators have indicated a need for system updates and additional resources.

CONCLUSIONS AND WAY FORWARD

- Based on the findings of this study the hospital has a structured emergency response system with regular drills and coordination with local services, but faces challenges such as staff shortages and limited advanced PPE.
- Limited resources impact the ability to fully meet the demands of emergency response, highlighting the need for better planning and additional staffing.
- Increase the frequency of emergency training sessions, particularly for doctors and paramedics. Ensure that training content is updated to address current conditions and emerging threats.
- Hospital should consider hiring a dedicated trainer or establishing a specialized team to

oversee and conduct emergency preparedness training consistent.

- Regularly review the plan and revise the emergency action plan to reflect current needs and best practices. Incorporate feedback from recent emergencies and drills to improve the plan's effectiveness.

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