

**EMERGENCY PREPAREDNESS AMONG NURSES AT MACHAKOS LEVEL FIVE
HOSPITAL IN MACHAKOS COUNTY, KENYA**

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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN NURSING OF
MOUNT KENYA UNIVERSITY**

JUNE 2021

DECLARATION AND APPROVAL

Declaration by the student

This thesis is my original work and has not been presented for a degree in any other university or for any other award.

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DEDICATION

I dedicate this work to my family, for their prayers, encouragement, financial and moral support they accorded me as I carried out this research work.

ACKNOWLEDGEMENT

I first acknowledge the Almighty God who gave me the courage and strength to face the different challenges in life as I carried out my thesis.

Thanks to my family, for their support, patience, perseverance and encouragement as I carried out my thesis.

I wish to thank my supervisors Dr. Nilufa Jivraj Shariff and Dr. Mutisya Kyalo for their continuous guidance and support.

My thanks also go to all the lecturers and my fellow students for their company.

I would like also to thank the management and the nurses of Machakos Level 5 Hospital for allowing me to conduct my study in their institution.

ABSTRACT

The approach to handling emergencies has not been efficient in the practice area, which could be due to deficient knowledge or lack of competence by the responders. This therefore leads to an increase in mortality, morbidity, and calls for sufficient readiness by nurses to prevent against future events. The study aimed at assessing whether nurses at Machakos Level 5 Hospital (ML5H) were prepared for emergencies. The study also looked in to strategies that ML5H has put in place to prepare nurses for emergencies. This was a quantitative study using a cross-sectional descriptive design. The study involved 132 nurses sampled from 405 the total population of nurses at ML5H. Selection of participants was done using stratified random sampling coupled with systematic random sampling methods. Self-administered questionnaires were used to collect data and an observation checklist that measured on emergency preparedness. Data was coded and entered into SPSS version 25 software for analysis. Data was analysed using descriptive statistics and Chi-square test was used to determine if it showed a significant relationship between variables. Majority (82%) of nurses dismissed the likelihood of natural disasters occurring at the hospital. More than a half (56%) of the nurses were found to have adequate knowledge on emergency preparedness; More than three quarters (76.5%) of respondents reported that the hospital did not carry out emergency drills. More than half (62%) of respondents reported of the availability of emergency training for all nurses. Knowledge and training, familiarity with procedures during emergencies, and familiarity with contents of emergency management plan significantly affected emergency preparedness at $P < 0.05$. The study recommended that, the hospital should conduct regular trainings of nurses on emergency preparedness to enable them respond to emergencies effectively and efficiently.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASPR	:	Assistant Secretary for preparedness and Response
EP	:	Emergency Plans
ED	:	Emergency Department
FEMA	:	Federal Emergency Management Agency
ICU	:	Intensive Care Unit
IFRCS	:	International Federation of Red Cross Society
JCAHO	:	Joint Commission for Accreditation of Healthcare Organizations
KRCS	:	Kenya Red Cross Society
KNCHR	:	Kenya National Commission on Human Rights
KNH	:	Kenyatta National Hospital
ML5H	:	Machakos Level Five Hospital
MOH	:	Ministry of Health
SPSS	:	Statistical package for the social sciences
UN	:	United Nations
UNHCR	:	United Nations High Commission for Refugee
WHO	:	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

World Emergencies Report, (2015) showed that, more than a half (60%) of emergency events had been reported in a span of 10 years. From the report, deaths increased from 600,000 to 1.2 million globally. Emergency preparedness is a long-term hospital and healthcare provider's preparedness activity. The objective of emergency preparedness is to empower hospital's and nurses capability in carrying out operations using the available resources in a convenient and timely manner. Nurses need to have the necessary knowledge to enable them handle emergencies. Preparing for an emergency is very essential and an important priority for everyone in every discipline for dealing with emergencies. Nurses play a significant role during emergencies and disasters. Emergency events are either natural or a consequence of human activities and its occurrence leads to sudden influx of patients in the health care institutions and put pressure on health care system' resources.

Hospitals around the globe could potentially be threatened by an emergency. Emergency Preparedness is a coordinated effort that requires a multidisciplinary approach, cooperation and participation of all sectors. It is a process of planning and preparation before an emergency occurs. It is a process that equips nurses with plans and resources that will ensure safety in an emergency event. According to Guha-Sapir et al., (2015), twenty two thousand people were killed and 70.3 billion USD (United States Dollar) worth of damage by emergent events in 2015. Guha-Sapir et al., (2015) further adds that, the rate at which emergencies are happening, there is a dire need or call for nurses' preparedness to handle such emergencies safely and competently in efforts to reduce or mitigate the impact on the health of the affected population. It may

not be possible to prevent or control emergencies; however, it is necessary for nurses to provide a successful response to the events (Ketty & Molina, 2012).

Approximately three quarters (75%) of people live regions at risk of public health emergencies (WHO, 2015). Various studies have reported wide gaps in emergency competencies and emergency preparedness among nurses (Nash, Georjin, Alexander, & Beach, 2015). The main goal of emergency preparedness is to guarantee that there are suitable frameworks, strategies and resources to provide immediate relieving measures to emergency casualties (Alexander, 2014). According to Turale and Veenema (2014), nurses globally have been reported to assume a noteworthy role in response to emergencies since early periods of nursing profession as demonstrated by Florence Nightingale when she cared for the wounded soldiers during the Crimean War.

Increasing number and frequency of emergencies and disasters globally requires nurses to possess adequate skills and competencies in order to respond and reduce the adverse effects on the affected population. Recently, efforts have been put in place to keep nurses updated on the guidelines concerning emergency preparedness in cases when emergencies and disasters strike (Labrague et al.,2016) According to Badakhsh, Harville, & Banerjee (2017), nurses play a vital function in reducing the effects of emergencies on victims, and their families. Nurses' role is seen in the way they handle complications occurring before, during, and after childbirth. Both the mother and baby are kept comfortable and away from any emergent event that could occur following the birth process, and cause morbidity or mortality to both the mother and the baby.

During emergencies, nurse team leader give directions to other members of the emergency response team on what to do, and who is to do what. Nurses act as team

leaders in coordinating activities in case of an emergency, ensure that the necessary supplies required for immediate use are made available and that are functioning properly. Further, it is reported that nurses have incorporated emergency preparedness measures in teaching institutions where they teach nursing students on how to prepare for emergencies by performing demonstrations and return demonstrations (Labrague et al., 2016).

Research from Ibrahim, Corrigan, and Samrasinghe (2014) shows that health care facilities have taken the initiative of providing extensive trainings to nurses and other healthcare providers in emergency drills and exercises, in an effort to ensure they are in a good position to attend to emergencies and disasters once they strike. Melnikov et al. (2014) argued that, although nurses have been informed on emergency preparedness measures, still evidence has shown that they have remained unprepared for emergencies. This calls for more enhancements on updates and guidelines regarding emergency preparedness (Usher et al., 2015).

Machakos Level 5 Hospital being the largest referral hospital in the Eastern region of Kenya, ML5H has critical emergency facilities, and it is situated along Nairobi-Mombasa Highway. Nairobi-Mombasa Highway is an area prone to many road traffic accidents and the nearest hospital that most of the accident victims requiring emergency attention are taken to. For this reason, it is important for the nurses at the hospital to undertake emergency preparedness measures in order to provide effective and immediate response to people involved in accidents (Republic of Kenya, 2016). There is lack of literature on emergency preparedness in Kenya particularly from Machakos County. Therefore, this study aimed at assessing emergency preparedness among nurses at Machakos Level 5 Hospital in terms of nurses' level of knowledge, and

institutional related factors influencing emergency preparedness. The study findings will assist in developing strategies to enhance emergency preparedness in the institution.

1.2 Statement of the Problem

The threat of natural and man-made pandemics occurring locally or globally, has made a number of public, private, county, state as well as local establishments to come up with preparedness measures. At frontline in preparedness are the nurses who are the first responders whenever an emergency happens (Moabi, 2017). Globally, it is estimated that nurses have low level of exposure to emergency and response preparedness (Baack & Alfred, 2013; Nash, 2015). Kenya has been plagued by several emergencies in the recent past, which include heavy rainfall lasting more than a month that caused a serious havoc in form of floods, which approximately claimed the lives of 100 people, as reported by the International Federation of Red Cross Society (IFRC, 2018) and the Kenya Red Cross Society (KRCS, 2018).

The Kenya presidential elections held on August and October 2017 led to civil unrests that claimed the lives of almost 55 people and approximately 150 sustaining injuries, report from the Kenya National Commission on Human Rights (KNCHR, 2017). Kenya Red Cross Society (KRCS) had placed emergency relief measures including emergency response team and other facilities in strategic places to assist people who were likely to be affected by post-election unrests. Facilities comprised of items such as ambulances, drugs, food and temporary shelters as well as other supplies in hospitals. Therefore, this emphasised the need for health institutions and the health workers to be well prepared for emergencies.

A similar study done in Kenyatta National Hospital in August 2012 indicated that, there was no adequate infrastructure to handle emergencies (KNH, 2012). According to reports at ML5H, there has been an increase in the number of casualties received into the hospital having been involved in road traffic accidents ((RTAs) along the Nairobi-Mombasa Highway), fires, floods, mudslides and other form of emergencies from the neighbouring counties of Makueni and Kitui. Emergency preparedness is very important and a priority for nurses to be prepared to handle emergencies. Nurses play an integral part in terms of emergency or disaster preparedness (Evans and Baumberger-Henry, 2014)

1.3 Study Justification

It is envisioned that the study findings will benefit the institution in formulating policies, procedures and strategies on emergency preparedness that are informed by evidence. The study will inform on the knowledge on emergency readiness among all nurses working in the health facility. The study will advise the hospital administration as one of its core task is to ensure training to staff and to avail the fundamental facilities like equipment at all time.

1.4 General Objective

The main objective of this study was to assess emergency preparedness among nurses at Machakos Level 5 Hospital.

1.5 Specific Objectives

1. To determine the types of emergencies received at Machakos Level 5 Hospital.
2. To assess the level of knowledge on emergency Preparedness among nurses at Machakos Level 5 Hospital.
3. To assess the institutional related factors that influence emergency preparedness among nurses at Machakos Level 5 Hospital.

1.6 Research Questions

1. What are the types of emergencies received at Machakos Level 5 Hospital?
2. What is the level of knowledge on emergency preparedness among nurses at Machakos Level 5 Hospital?
3. What are the institutional related factors that influence emergency preparedness among nurses at Machakos Level 5 Hospital?

1.7 Null Hypothesis

There is no statistically significant relationship between nurse's level of knowledge and actual practice on emergency response at Machakos Level 5 Hospital.

1.8 Theoretical Framework

It is a framework based on an existing theory in a field of inquiry that is related and/or reflects the hypothesis of a study.

The study was anchored on the application of Social-Cognitive Learning Theory, a Behavioural Theory to Emergency Health Preparedness by (Douglas Paton et al, 2015). Social or Observational Learning Theory states that, new behaviors can be learned efficiently by observing other people do them. Social learning theory emphasizes the interaction between the environmental social features, how people perceived them, and how motivated an individual is to give back what they have seen others do before. The key concept of social learning theory is that, it can be used in at least any social and behavior change communication (SBCC) program that targets to influence social behaviors, especially behaviors that are complex or require interactions with other people. It may be especially useful when a particular behaviour is hard to describe, but could be explained through demonstration/ return demonstrations or modelling. People can influence or get are influenced by the world around them. The Theory also states that, behaviour can be studied in a systematic and observable manner regardless of

internal mental states and that any person can potentially be trained to perform any task, regardless of genetic background, personality traits, and internal thoughts (within the limits of their physical capabilities). The model states that preparedness for emergencies at organizational levels could be more effective tools in mitigating (the growing incidence) of disaster risk and ameliorating their impacts. Preparedness efforts focus on changing human behaviours in ways that reduce people's risk and increase their ability to cope with hazard consequences. According to Paton (2015) Social-Cognitive Model describes reasoning processes on preparedness items that encompass nurses' preparedness on training to refresh their skills and competencies to rescue people involved in tragedy, preparing of hospital emergency plans.

1.9 Conceptual Framework

A conceptual framework is a structure, which the researcher believes can best explain the natural progression of the phenomenon to be studied (Grant & Osanloo, 2014) Cognitive factors (personal factors), Environmental factors, Behavioral factors that determined human behaviors, and institutional factors to include training through capacity building of nurses, existence of an emergency plan and presence of an emergency response team influenced emergency preparedness.

Independent Variables

Dependent Variable

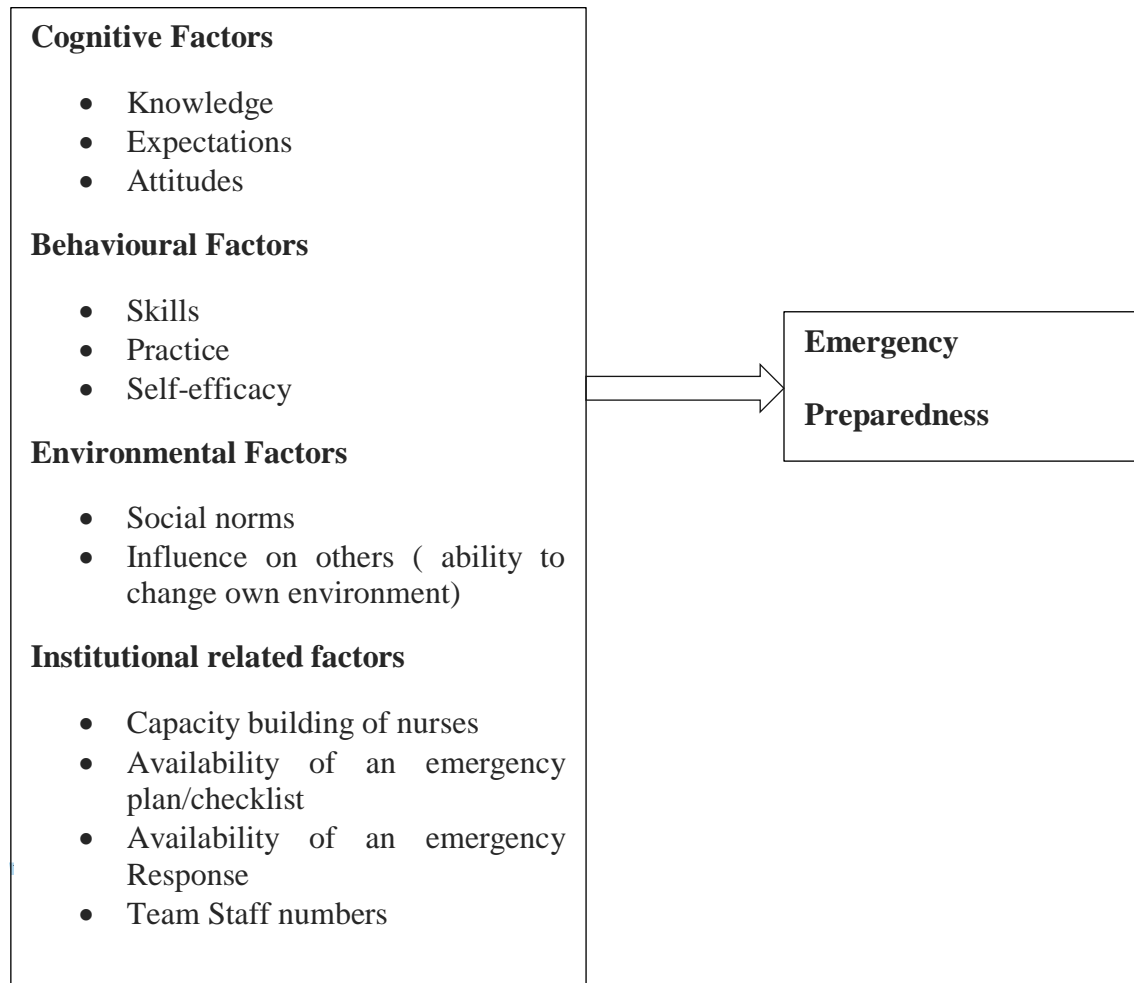


Figure 1: Conceptual Framework

Source: Author's Construct

1.10 Significance of the Study

Study findings shall benefit the growing body of knowledge regarding emergency preparedness among nurses. Furthermore, the study identified strengths and gaps in knowledge among nurses working at ML5H. Additionally, the results of the study will guide the institution in improving and enhancing emergency preparedness by developing evidenced informed strategies.

1.11 Study Limitations and Delimitations

The study was conducted at ML5H therefore; the results are limited to one hospital and so cannot be generalized to other hospitals in the country. The stipulated period required to carry out the study was limited. To meet this challenge, I had to apply for a study leave to have enough time for the study. There was a delay from the National Commission for Science, Technology & Innovation in getting the research permit for me to start the process of data collection.

1.12 Operational Definition of Terms

Emergency: unexpected event that disrupts normal operations within a health facility and requires an immediate action by health care providers to take care of the situation without seeking external assistance.

Emergency preparedness: Includes all activities, such as, plans, procedures undertaken by the health care facilities and providers in anticipation of a likely emergency. The main aim of preparedness activities is to ensure that nurses and hospitals are ready and able to respond quickly and effectively.

Emergency plan: Written set of instructions that outlines what health care providers in a hospital should do in case of an emergency.

Disaster: According to Randolph et al. (2015) disasters are sudden, unexpected, progressive events that cause significant disturbance of a hospital functioning and require immediate action to stabilize the situation

Types of emergencies: These incidents range from affecting individuals to populations. The incidents range from natural emergencies to technological or man-made causes that are a threat to human beings.

Structural Vulnerability: concerned with how buildings interfere with efficient management of emergencies, for example, limited space, slippery floors etc.

Functional Vulnerability: elements that can interfere with the operations/functions of a health care facility in times of emergencies should be eliminated to ensure that the services provided by the facility keep running to meet the demands of the affected population. For example, Transportation and communication, equipment and supplies need to be addressed adequately.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Literature review is an account of what has been published on a topic by accredited scholars and researchers. Literature review enlarges knowledge about the topic and promotes skills, information seeking and critical thinking to apply principles of analysis to identify unbiased and valid studies. The purpose of literature review was to determine what has already been done related to the study to avoid duplication; form a framework for data interpretation; and demonstrate familiarity with existing knowledge. Literature review helped in narrowing focus of research and definition of the problem. Literature review helped to determine new approaches, stimulate new ideas, and identify new areas of research. Review of the literature focused on the types of emergencies received at ML5H; the level of knowledge among nurses working at ML5H; and the institutional related factors influencing emergency preparedness among nurses at ML5H.

2.1 Types of Emergencies Received in the Health Facilities

Emergencies are serious, unexpected, and often dangerous situations that disrupt the normal operations within a health facility and requires an immediate action to address the situation without seeking external assistance. Approximately 315 emergencies due to natural causes while 203 due to technological risks were reported worldwide with a more than a half (60%) increase in the last decade according to Centre for Research on the Epidemiology of Emergencies (CREE, 2016). Moreover, research from World Emergency Report, (2016) showed that, emergencies increased by seventeen percent with mortalities rising from 600,000 to more than 1.2 million people affected. Kenya has been plagued by several emergencies in the recent past, which include heavy rainfall lasting more than a month that caused a serious havoc in form of floods, which

approximately claimed the lives of 100 people, as reported by the International Federation of Red Cross Society (IFRC, 2018) and the Kenya Red Cross Society (KRCS, 2018). According to reports at ML5H, there has been an increase in the number of casualties received into the hospital having been involved in road traffic accidents ((RTAs) along the Nairobi- Mombasa Highway), fires, floods, mudslides and other form of emergencies from the neighbouring counties of Makueni and Kitui. WHO defines disaster as an event that causes interruption to the normal health facility's operations causing depletion of the available resources and this call for assistance from outside the hospital to care for the affected emergency victims. In other words, the definition in terms of hospital's emergency and trauma care units means that the incidence causes a huge damage within a very short time, more resources are needed that are in excess of what the health care facility can afford and this has to be accessed from outside sources to solve the incident. This requires immediate attention to address the occurrence within the shortest time possible to avert further damage to the population, and property. These incidences may include multiple road traffic accidents and crashes, massive events like the North Ridge earthquake; Hurricane Katrina, Hurricanes, also called Cyclones or typhoons in other parts of the world. Cyclones can cause high tidal waves, winds, and heavy flooding that is dangerous and destructive to the environment and people. A good example is the Cyclone incident being experienced in Mozambique according to the National Geophysical Data Centre (NGDC, 2019), many people have been killed and property worth of millions destroyed. Emergencies may be natural or man-made incidents.

2.1.1 Natural Emergencies

Natural incidents occur under natural circumstances and may include floods, earthquakes, volcanoes, landslide/mudslides, and disease outbreaks. Floods are caused

by heavy rainfall or thunderstorms and happen frequently. Floods of whatever magnitude can cause losses effecting health care facilities as this causes influx of victims affected by the floods for attention and help. Precaution steps need to be put in place to mitigate the effects. Hospitals need proper preparations to receive victims who have been involved in flooded areas as this water carries with it a lot of soil, sharp objects that make the floods dangerous and precipitate the damage to the people. According to the National Geophysical Data Centre (NGDC, 2019), major storms and severe weather have happened before affecting large populations.

In Kenya NGDC, (2019) reported extreme hot conditions in the month of March 2019, which has been experienced in the last few weeks. Regarding earthquakes, National Geophysical Data Centre reports that, 150 earthquakes are adequate to be experienced and can occur at any time and at any region and their impact can be experienced enough for some time before they end. NGDC, (2019) further adds that, the deaths that have already been reported so far occur in most cases following falling walls, and other objects due to shaking. Extreme weather conditions, for example, very hot or cold conditions, flooding, or carbon monoxide are termed as emergencies and require immediate/ emergency attention by hospitals and health care providers to prevent or reduce negative consequences on people.

2.1.2 Technological/ Man-made Emergencies

Man-made or technological incidents occur due to human activities and these may include the terrorists bombings, motor or road traffic accidents, fires, plane crashes, boat accidents, aflatoxin poisoning. Emergencies occurring due to harmful chemical spillages may result from acts of terrorism used by terrorists to attack a group of people or these may be chemical reagents used in hospitals for specific purposes. Emergencies

involving the release of radiation could have negative effects or harm people's health. According to WHO, (2017) radiological materials have been associated with infertility in both male and female populations. Countless acts of terrorism have been committed using explosives and firearms used in various parts of the world with the recent attack in Kenya, on the terrorist attack on Dusit D2 hotel on January 15, 2019 where more than 700 were rescued and 21 others killed according to the Inspector General (IG) of Police- Kenya, Joseph Boinnet, and the Government of Kenya in a press briefing on 15 January 2019 at Jogo House, Nairobi. The various types of emergencies as in Table 1 below.

Table 1: Types of Emergency Events

Type of emergency	Event	Place and when	Number died/ affected
Natural	Earthquakes	Indonesia / China (25.2.2019)	73,000 (69000 injured)
		Kashmir (2005)	57(5000+ injured)
		Northridge, California (1994)	57(5000+ injured)
	Floods/Landslides	Kenya (April 2018)	-
		Indonesia, Peru, Sudan, Algeria, Tunisia (week 5-2019)	-
Tsunami	12 countries (2004)	212,611	
Technological Accidents	Plane Crash	Ethiopia (10.03.2019)	157
	Traffic accidents	Kakamega bus, Kenya(8.10.18)	68
		Makomero (bus), Tanzania (April, 2018)	-
	Shipwreck	Mutima, Uganda(19.11.2018)	-
	Boat accident	Gandi, Nigeria(3.8.2018)	-
Embassy bombing	Nairobi/ Tanzania,(1998)	224(>4000 injured)	
Fires	Forest fire	Pakistan/Malawi	
	Kyanguli fire tragedy	Machakos, Kenya(24.3.2001)	67
	Nightclub fires	Rhode Island(2003)	100(200+ injured)
Food Poisoning Disease Outbreaks	Aflatoxin Poisoning(2004)	Central/Eastern, Kenya	125
	Measles outbreak	Philippines(09.03.2019)	-
	Zika Virus	Florida, America (2017)	
	HIV/AIDS	Kenya(2011)	49,126
	SARS	25 countries (2002-2003)	774

Source: Emergency Database (EM-DAT) & personal compilation from different sources.

It is imperative to be aware that some threats emanate from within the organization, for instance a hospital that stores hazardous chemicals is likely to experience disasters whenever something goes wrong. Other risks that are likely to affect the organization and are external are things such as floods, fire, among others. According to Zhang,

(2018) effects of heat caused by global warming to the implications of different diseases to other factors that affect the global health are extremely diverse and dynamic. Nurses have always faced all sorts' incidents arising from man-made and natural causes like landslides, fires, gas leaks or explosives and floods (WHO, 2016).

The threat of sudden disruption of activities within the hospital cause serious danger to communities' life and health. Because of terrorism incidences in the past CDC, (1998) established the Bioterrorism Preparedness and Response Program following the 7th August 1998 bombings in Kenya and Tanzania. This approach has been recognized as the main public health concern, which has been the main centre for channelling funds and other resources (Christopher, 2017). When a natural disaster strikes, a number of hospitals are likely to run out of water, damages caused by violent winds many, some may find themselves in mobbed by stagnant water caused by floods after a long period. Buildings, equipment's, and supplies are likely to be severely damaged thereby hampering nurse's efforts in carrying out their activities as expected.

Restoring hospitals to their full functioning capacity is a complex task that requires the support of various experts from different professions. After the reconstruction, close inspections of the restored structure will be essential to detect any problem and to start control measures. Risk analysis is an activity carried out to identify likely threats that could cause disruption within an organization. Threats can easily be avoided whereas natural disaster is very hard or impossible to prevent. This can be done by testing the plan. For example, if there are two exit points on the on the fifth floor, then it is important to confirm the existence of the two exits and ensure that they are both functional. Fire fighting equipment should be identified to determine their exact location as indicated by the plan. People consider risks based on the magnitude too big

or small (Coppola et al, 2016). Research from Hodge et al., (2015) showed a research conducted in the United States on readiness of nurses regarding emergency preparedness, 50% of the nurses reported that they were unprepared for emergencies.

Al Khalaileh et al. (2018) explored emergency preparedness of nurses in Jordan and found 65% of nurses rated their state of emergency preparedness as low and poor.

Tzeng et al., (2012) argued of a study on cervical manipulation clinical practice guidelines he explored in Taiwanese showed nurses who had trained on emergency preparedness handled emergencies competently, and made quick decisions concerning clinical management on victims involved in accidents.

2.2 Level of Knowledge on Emergency Preparedness

2.2.1 Level of emergency preparedness report among nurses

Understanding emergency preparedness enables nurses to take part in all stages of an emergency, and to actively and effectively participate in emergency management plans included in the healthcare system. Based on this, the study aimed at determining the types of emergencies received at ML5H; to assess nurses' level of knowledge among nurses at ML5H, and to determine the institutional related factors influencing emergency preparedness among nurses at ML5H. Although different scales have been performed to assess knowledge on emergency preparedness among nurses, reviewed literatures in the previous studies indicated that, nurses had a low to moderate levels of knowledge concerning emergency management (Al Thobaity and Hodge., 2015).

Research from Hodge et al., (2015) showed that, in a research conducted in the United States on readiness of nurses regarding emergency preparedness, a half (50%) of the nurses reported that they were unprepared for emergencies. Baack and Alfred, (2013) conducted a study to assess 620 nurses in the United States regarding knowledge on emergency preparedness. Nurses obtained a mean score of 90 out of 205 which was the

total marks using the Emergency Preparedness Information Questionnaire (EPIQ). This showed inadequate knowledge and skills in handling emergencies. Research from Labrague and Usher, (2016) showed a study that was conducted in the Philippines and reported that, majority (136) of nurses were not adequately prepared and were not confident in responding effectively to emergencies, While (n=34) of nurses recognized themselves to be much prepared for emergencies once they strike.

Tzeng et al., (2016) argued of a study he explored in Taiwanese indicated that nurses who had trained on emergency preparedness handled emergencies competently, and made quick decisions concerning clinical management on victims involved in accidents. Research conducted by Al Thobaity et al., (2015); Ibrahim (2014) showed that, nurses who worked in Accident and Emergency departments and in the Intensive care units, were more competent in handling all forms of emergencies received within the hospital and performed their roles in a more coordinated manner, acted fast and each member of the response team was aware of his or her duties allocated to Them. Without a physician, Nurses in Bangladesh and Laos could not attend to emergency victims, as they needed someone whom they could consult, as they felt incompetent, while another group of nurses in Cambodia and Solomon Islands felt they could not carry out emergency related biological and chemical agents' assessments, according to a study carried out by Usher et al., (2015).

2.2.2 Previous Emergency Response Experience

Nurses who had an experience and attended to emergencies on mass casualty accidents and other forms of emergencies showed high levels of preparedness to emergencies. For example, the infectious disease outbreaks that have occurred before with the inclusion of the 2009 Severe Respiratory Syndrome (SARS) nurses proved to be fully

prepared for any emergency (O' Sullivan et al., 2008). According to Nilsson et al., (2016), nurses with advanced age and had a longer experience at work place, handled emergencies competently and acted fast during emergencies compared to newly employed nurses with a short experience in dealing with emergencies. Usher et al., (2015) adds that, although newly employed nurses acted fast because they were still young and energetic, they did not seem to understand what emergency preparedness meant and handled emergencies in an uncoordinated manner.

2.2.3 The Role of Emergency Trainings

Oztekin et al., (2016) align the findings that, nurses who had been exposed to performing emergency drills, exercises and trainings were better placed when it came to handling emergencies and disasters once they happened. Emergency drills and exercises are important as they prepare nurses to handle all forms of emergencies. Such nurses, who underwent through drills and exercises triaged casualties according to the triaging technique, did first aid according to the laid down standard operating procedures and made informed decisions on how to care for the affected people as fast as possible and in a coordinated way (Tzeng et al., 2016). A study by Labrague et al., (2016) indicated that, nurses who had undergone any training on first-aid, triaging of people involved in mass casualty accidents, had trained on Basic life support (BLS), had undergone a training on Advanced cardiovascular life support (ACLS), and were trained on infection control handled emergencies as recommended and observed high levels of disease prevention and cross-contamination from one patient to the other. Hospitals demonstrated a high level of preparedness for emergencies in terms of providing adequate training to nurses and putting in place the necessary supplies, for example, personal protective equipment to include gloves, masks, aprons, boots for its healthcare professionals (Oztekin et al., 2016).

2.2.4 Awareness of and Execution of Workplace Emergency Plans

Research from Ibrahim (2014); Labrague et al., (2016) showed that nurses were aware of the availability of an emergency management plan as a framework in providing quality nursing care. The nurses, who were aware of the plan, proved they could handle emergencies competently. However, despite their awareness, one quarter (25%) of nurses reported of not reading the emergency management plan and less than a quarter(10%) did not know where the plan was kept and could not retrieve it in case they needed it, or in an event of an emergency occurring. A study conducted in Saudi Arabia showed that, out of the nurses assessed on emergency preparedness, more than a quarter (39.2%) reported of being not aware if the hospital had the emergency management plan in place. Another group of nurses reported of not knowing whether the hospital reviewed the plan regularly (Ibrahim, 2014)

2.2.5 Strategies to Enhance Emergency Preparedness

Nurses should be offered the chance to take part in emergency drills, exercises, and trainings in order to perfect their knowledge, skills, and competencies regarding emergency preparedness (Oztekin, 2016). Cognitive Model describes association of items, to include; taking trainings by nurses to refresh their skills and competencies that enable decision making to prepare for hazard activity (Paton, 2000). Research from Basnet et al., (2016) reported that, many of nurses had never received any training, had never had any drill or exercise on emergency preparedness, and did not have the capability, knowledge, and skills to participate in emergencies.

2.3 Institutional Related Factors Influencing Emergency Preparedness

2.3.1 Health Facilities Preparedness for Emergencies

Hospitals should continually remain prepared for emergencies at all times in order to handle emergencies and disasters of all kind. The study aimed at determining the types of emergencies received at ML5H; emergency preparedness of nurses, regarding their level of knowledge and institutional related factors influencing emergency preparedness. Institution covered in this study was the health care facility (hospital). For health facilities to be ready for emergencies, they should recognize an emergency management plane as an essential framework for providing quality nursing care to the affected victims in case of an emergency; hospital administration should support the emergency response team by providing the requirements needed during emergencies; the hospital management need to monitor and regularly review the contents of the emergency management plan; hospital management should regularly perform emergency drills and exercises to its healthcare professionals; hospital institutions should provide relevant equipment, for example, mechanical ventilators and other life sustaining equipment to safeguard the continuity of critically ill patients; and finally the hospital has to ensure there is adequate evacuation plan for doors and exits.

FEMA (2016) recommends that hospitals globally should ensure that proper planning is put in place to ensure that operations are not interrupted in case of an emergency being received in the hospital setting. Planning is always the initial step in every level of operation and it is always vital for hospitals in order to reduce or mitigate any negative effects associated with emergencies. Recent health care disease outbreaks, most notably Ebola, has shown the potential of hospital engagement as a resource that can either help or hinder institutional responses to emergencies. It has been shown that for healthcare emergencies to be managed efficiently and without failure, proper planning strategies

must be put in place. Emergency management planning involves equity where the anticipated emergency has to balance with the available resources so that resources do not become scarce during the process of attending to the affected victims. An emergency plan is a dynamic document that frequently needs to set and adapt to the changing trend of emergencies, the procedures, policies, the roles and responsibilities of the nurses have to be reviewed regularly.

Emergency planning is an exploratory process that helps in coming up with new ideas and informed decisions that assist in prioritizing and anticipating for emergencies that are not easily predicted. Emergency Plans need to be developed and made to focus on the emergencies happening locally within the hospital and extend to the other levels of care. Poor planning and failure to anticipate effectively for unforeseen emergencies may lead to serious loss of life because the necessary measures that could save these lives have not been planned prior to receiving emergency victims. Research from Niska and Burt, (2015) CDC report on emergency preparedness showed that, emergency Plans are not only required for handling emergencies and disasters, but they also ensure that the hospital remains prepared at all times for any form of crisis, and to effectively assist in recovery of the affected victims. Dealing with emergencies is a social process that requires public support for planning initiatives and participation by a wide variety of responders and technical experts. The efforts initiated should be the ones that are sustainable in case they are faced off by challenges in future, should be able to accommodate the fast growing population, and should be the one that addresses needs of people despite their wealth, positions, in short, the hospitals should be in a position to address all issues regarding emergency preparedness as presented.

In this era of technology hospitals are required to ensure measures are in place that addresses the increasing complexity of modern emergencies that need health care professionals who are well trained on modern technology. This is well shown with the way the roles and responsibilities in emergency management and response on information and communications technology are on the increase. Emergency responders and team leaders should be actively involved in planning for adequate and modern related resources so that they are able to address future trends and the dynamicity of fast changing technology. In globalizing, technology regarding emergency management has widely expanded which has led to fast, timely, and effective strategies in which emergency responders approach to emergencies and disasters.

2.3.2 Hospital Trainings and Emergency Drills

A drill is an activity that is undertaken through strict and well-coordinated simulations that are supervised to put into a test a certain specific operation within a hospital. Drills can be used to test new policies or procedures that have been introduced in the health facility to assess on the preparedness of healthcare professionals towards emergencies. Drills provide simulations on new equipment, which help practice and maintain current skills in line with the current guidelines on emergency preparedness. Emergency preparedness drills are the most accurate and efficient measurements of emergency management and response. Drills and simulations are also excellent tools for training, and for assessing decision-making processes, teamwork, and coordination. When planning for exercises and drills, the objectives and aims should be made clear to make it easy to understand by the people using it. This ensures that, the standard operating procedures are used as laid down and no mistakes are attempted. When conducting simulations, the process has to be supervised closely so that any weaknesses are

identified and correct instructions provided to improve emergency response among the participants. The participants have to treat drills as forms of learning experiences and perform them as real experiences because as new ideas are identified, it in turn improves the emergency management plan as it is revised as regularly as possible to cope up with the current trends of emergency care.

Drills give a picture on levels of emergency preparedness among participants and since emergency plans clarify on the roles and responsibilities of responders, emergency managers are capable of assessing what roles need to be improved in order to handle emergencies promptly and effectively (Veenema, 2013). Emergency drills are important means of providing emergency response training to health care professionals on how to respond to mass casualty incidents from acts of terrorism or other public health concerns (Moabi, 2017). Healthcare facility preparedness for emergencies, whether natural or technological are real experiences in life. Healthcare organizations need to meet several considerations in an effort to prepare for an emergency.

Assistant Secretary for Preparedness and Response (ASPR) developed the 2017-2022 Health Care Preparedness and Response Capabilities document that described the necessary requirements health care delivery systems should have in place to facilitate prompt and efficient response to emergencies that are of public health concern. The document also stated that, hospitals should develop and implement exit and evacuation plans that allow easy and free movement of victims involved in accidents in various points of care within the hospital. The policies should also contain protocols on communication that clearly state the roles of a team leader in an emergency setting. The team leader allocates various duties and responsibilities to different members of the emergency response team, gives instructions to each member depending on the type of

duties allocated to, allocation of duties will depend on several factors like area of specialty, years of experience in responding to emergencies, and training on emergency preparedness.

To ensure that these duties and responsibilities are performed effectively, there are essential supplies to include intravenous fluids, syringes and needles central venous catheters, among other supplies; information sharing in case of a patient requiring transfer to a higher level of care; essential equipment to include access to mechanical ventilation and life sustaining machines and medication to safeguard the continuity of critically ill patients; evacuation plans; patient surge and managing mass casualties by provision of adequate work place with waiting and receiving areas. The Joint Commission is concerned with monitoring and evaluation of operations relating to emergency preparedness policies.

Joint Commission ensures effective communications, adequate resources, give clear roles and responsibilities that help safeguard life and provide support to vulnerable populations. A good indicator of hospital preparedness is when it adequately anticipates for unforeseen incidents that could pose harm to people. Different emergencies are prone or tend to occur at specific regions, so it is necessary for healthcare institutions and healthcare providers to have in mind what emergencies are likely to happen at their region and prepare for them adequately. For example, regions that are prone to earth tremors have been fitted with specialised equipment that help detect and give warnings to geometrological departments who in turn inform people around the area by either telling them to move away. Hospitals also need to be prepared in the event of such an incident occur. (Barbera and Kelen, 2014). Scientists have predicted the rate at which weather conditions have remained on changing, it has led to extremely hot regions that

should not be experiencing hotness at normal conditions. Acts of terrorism have become common, the latest being the attack at Dusit D2 hotel in Nairobi, Kenya where 22 Kenyans were killed and others injured according to the Inspector of Police(IG). An analysis of the current status of hospital emergency preparedness for infectious disease outbreak in a research conducted in Beijing, China to assess the state of nurses preparedness on infectious disease outbreak reported that, majority (93.3%) of the respondents reported of hospital providing them with the personal protective equipment (PPEs) while 6.7% reported that the hospital did not provide PPEs to its nurses to prevent against disease that spread over a very short period of time.

A case study is a postulated sequence or development of events. Case studies are used to explore new ideas on experiences regarding emergency preparedness. Case studies give wide range of results that communicate on future predictions since it is an exploratory tool and acts as a reference event. An emergency incident that happened many years ago may be used by that healthcare facility as a case study that may be used to teach nurses on emergency management. Information relating to hazards representing a wide range of similar emergency impacts should be added to the case study. This gives the scenario some in-depth understanding about emergencies, their effects to the population, and plan for the emergencies adequately in future. Since the information may not be the one in current practice, in terms of the economy and technology, modern conditions with the current technology need to be included to the case study. The healthcare facility then gives a comparison between the impact caused on susceptible population and the response emergency services.

From past researches, hospitals have been reported to have provided adequate trainings to nurses and what was reported in return was an efficient and timely response to

emergencies. Nurses also reported that the training had enhanced competence and confidence towards emergency management strategies. Hospitals have been reported to incorporate emergency management in their plans as a framework for quality nursing care, and they have participated in the regular review of the plan to ensure that it delivers the intended purpose of emergency preparedness.

2.3.3 Network organizational structures

Linkages between hospital departments are essential as it ensures continuity and provision of healthcare promptly and effectively. The operation of emergency administration structures is frequently risky at territorial and local levels. Real issues incorporate vertical correspondence between various levels of government and low levels of adequacy in neighbourhood structures for crisis and debacle administration. Most nations have plans for the association of crisis and calamity administration at commonplace and locale levels.

Columbia, Turkey and Bangladesh, own courses of action for crisis and debacle administration, approaching the national government when required as per the arrangements of the national arrangement. In Bangladesh, nearby governments are knowledgeable about managing rehashed catastrophes in their own territories (IGAD, 1998). Kenyatta National Hospital serves as the largest specialized health facility linking all countries in East and Central Africa, where patients involved in disasters are referred to for specialized care. Machakos Level 5 Hospital also links health facilities on the Eastern parts of Kenya and serves as the main referral centre for the bordering counties. This is due to its availability of essential facilities such as Intensive Care Unit (ICU), and an operational trauma centre.

Hospital networking does not really mean connecting up of different social insurance offices with correspondence systems. System fundamental means a dynamic connection between different social insurance offices of a given land zone for increase or enhancement of accessible assets. It implies that the specialists must have the data about the accessible wellbeing assets in their general vicinity. The human services offices must be arranged to ensure empowerment, and hands on skills. Evaluating association, wellbeing division and reaction ability in crisis and fiasco circumstances suggests the advancement of a working philosophy that permits the inclusion of the whole wellbeing segment. Thought ought to be given to the wellbeing structure's association and capacities, wellbeing establishments and specialized projects, enactment, intra-sectoral and inter-sectoral coordination, and other key zones identifying with crisis and debacle reaction (PAHO, 2014). The cycle of arranging, practicing and modifying is ceaseless. The more individuals are occupied with the procedure, the better set they up will be.

A standout amongst the most noteworthy components adding to fortified social insurance readiness is the development of Healthcare Coalitions, which, since its foundation, have included cooperation and systems administration among clinics and between doctor's facilities, general wellbeing divisions, and crisis and catastrophe administration and reaction offices. These alliances speak to the start of an organized communitywide way to deal with restorative crisis and disaster reaction. In the event that they can keep on being produced and fortified around the nations, alliances would consistently turn into the establishment of a more robust national emergency wellbeing that would provide some timely help of another's alliance Waldhorn and Franco, (2019). In request to arrange different social insurance offices, the area specialist ought

to break down the accessible assets regarding material and prepared labour. This aide in surveying the current abilities and restrictions (WHO, 2017).

2.4 Functional Vulnerability

Practical weakness should be considered and disposed of for establishments, particularly the basic offices, for example, hospital facilities, emergency task centres, correspondence centres, to guarantee that the administrations given by the offices would continue racing to meet the requests of the network required Leon and Villagran, (2015). A similar journal by Jain *et al*, (2018) functional vulnerability could range from site accessibility to areas within the hospitals. Inaccessible locations within a health facility may include congested areas with poorly constructed buildings within a town, swampy areas that are always flooded during rainy seasons which leads to water bridges being washed away, or very narrow roads towards the hospital where emergency vehicles may not pass with easy. Holvorson and Hamilton, (2020) added that, a hospital is also functionally disadvantaged when there are no alternative roads, only one road leading to the hospital that is stony and bumpy. Service area within the hospital, according to Jackson (2018) can also make a hospital be functionally vulnerable to emergencies and disasters.

2.5 Structural Vulnerability

This classification of weakness relates to the auxiliary components of the structures, for instance, stack bearing walls, sections, shafts, floor and rooftop (Allen, 2015). These basic components ought to be fitting to the building area and the normal risks regular in the nation (Birkmann, 2017). Haider (2019) noticed that the territory where the doctor's facility or health care facility is found might show conceivable dangers, for example, flooding in valleys or along inclines. On-auxiliary components of a building incorporate engineering components, (for example, roofs, windows and entryways).

These components are significant to the day-by-day task of doctor's facilities and wellbeing offices. In the event that these were harmed, they would not have the capacity to work and may even reason physical damage to patients and faculty (Cannon, 2014)

2.6 Summary of the literature

Literature review is an account of what has been published on a topic by accredited scholars and researchers. Review of the literature focused on the types of emergencies both natural and manmade received at ML5H; the level of knowledge among nurses working at ML5H; and the institutional related factors influencing emergency preparedness among nurses at ML5H. Majority of the nurses agreed on the manmade type of emergency as the most common. Research conducted by Al Thobaity et al., (2015); Ibrahim (2014) showed that, nurses with previous emergency response experience, for example those that had participated in disease outbreaks. One of the studies by Baack and Alfred, (2013) showed that, nurses obtained a mean score of 90 out of 205 which was the total marks using the Emergency Preparedness Information Questionnaire (EPIQ). Nurses at ML5H reported that, they had been trained by the hospital on emergency preparedness and on emergency drills while others did not agree with the report. Overall, the authors concluded that participants were inadequately prepared to respond to emergencies. Organizational networking between hospital departments had been ensured for continuity and provision of healthcare promptly and effectively. Structural functioning was poor, but was in the process of being improved.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter includes the research design, study population, sampling process, data collection instruments, procedure used to control data quality, data management plans(data processing and analysis plans), how study results were presented, and the ethical considerations applied in the research.

3.1 Research Design

The study was quantitative using descriptive cross- sectional design. Quantitative Research is strictly focused on addressing an issue that the researcher intends to address without going into other things that are out of the focus of study (Observations are under controlled conditions).The researcher clearly specified in advance, what would be measured, and the procedure that would be used to obtain data. The problem would be quantified by generating data using numbers bringing in forth information that would be changed to useful statistics that can be used. Quantitative research can be used to quantify attitudes, opinions, behaviours, and other defined variables – and generalize results from a larger sample population. Quantitative Research uses measurable data to formulate facts and uncover patterns in research. Descriptive data was collected to answer questions concerning the status of emergency preparedness among nurses at ML5H and provide factual descriptive picture of the situation as it exists. Data was collected over a period of one month.

3.2 Variables

A variable is a measurable characteristic that assumes different variables among characteristics.

3.2.1 Independent Variables

Independent variables are the interventions or actions that indicated that nurses were prepared for emergencies; an independent variable is hypothesised to be the cause of a particular outcome of interest. It can be changed or manipulated in a series of experiments. The independent variables in this study included; types of emergencies received in the hospital, nurses' level of knowledge on emergency preparedness, and institutional related factors influencing emergency preparedness. These variables were achieved which showed that the nurses were prepared for emergencies.

3.2.2 Dependent Variable

This is the variable that is influenced by the manipulated aspect; or the result measured to see effectiveness of the treatment .It is intended to measure as opposed to manipulate. For this study, the dependent variable was Emergency preparedness.

3.3 Study Area

The study was conducted at ML5H in Machakos County. It serves as the main referral health care facility for health centres, sub-county hospitals and from the neighbouring Makueni and Kitui Counties. It offers inpatient, outpatient and specialized services to include intensive care services, renal services, oncology and palliative care services and has the largest Accident and Emergency department with adequate waiting and receiving areas that can hold large number of casualties. The referral hospital also serves as a teaching facility for nurses from the Kenya Medical Training College (KMTC) Machakos and other neighbouring colleges. The health care facility is allocated along the Nairobi-Mombasa highway, a region prone to road traffic accidents. Therefore, it serves as the main referral hospital for the accident victims. A good example is the accident at Athi River on the 5th March 2019, involving two Zambia

Ambassadors to Kenya; they were rushed to ML5H for emergency care services including intensive care services before they were transferred to Nairobi for further and advanced medical/nursing care. ML5H has also been selected as one of the healthcare facilities for piloting Universal Health Care (UHC) by the Government of Kenya because of its association with the road traffic accidents along Nairobi-Mombasa highway.

3.4 Study Population

The study population included all nurses at Machakos Level 5 Hospital who are 405 in total and are distributed in various hospital departments. These departments include Accident and Emergency department, Intensive care unit, renal unit, Medical/Surgical department, Obstetrics, paediatrics department, Psychiatric department, theatre and other departments.

3.5 Inclusion and exclusion criteria

The study included all nurses working on day duty, nurses available during data collection, and nurses who consented to participate. The study excluded nurses who were away on leave, or any other offs during the time of data collection, nurses who took part in the pre-test.

3.6 Sample Size Determination

Determined using Cochran's for a population less than (<) 10,000 (Mugenda & Mugenda, 2003, p.43) as follows;

$$n = \frac{Z^2 pq}{d^2}$$

Where;

n= the desired sample size.

Z= the standard normal distribution at 1.96 at (95% confidence level)

P= proportion of the targeted population that have the characteristic focusing in the study estimated at 50%. In this study, the particular characteristics were the nurses at Machakos Level 5 Hospital.

$$q=1-p$$

d= degree of accuracy set at 0.05/ degree proportion of error that should be accepted in the study (0.05) that is 5%.

Substituting these figures in the above formula:

$$\text{Thus } n=1.962*(0.5*(1-0.5)$$

$$0.052$$

$$\text{Hence; } n= (1.96*1.96)*(0.5*0.5) = 1.962*0.5*0.5$$

$$(0.05*0.05) 0.052$$

$$=3.8416*0.25$$

$$0.0025$$

$$n= 384.16$$

Since the target population was less than 10,000, the sample size was adjusted using the Finite population correlation Factor (FPC) formula:

$$nf=n/1+n/N$$

Where;

nf= the desired sample size after Finite population correlation factor was applied.

n= the desired sample size (384) from the above calculation; (where the population is greater than 10,000)

N= the estimate of the population, include 405 nurses.

Hence, the desired sample size for nurses will be;

$$nf= 384/1+384/405$$

$$=384/1+0.948$$

$$=385/2.91$$

$$=132.3333$$

This gives us approximately 132

The researcher added 10% (32) of the sample as attrition to cater for any non-response.

This gave a sample of 164.

3.7 Sampling Techniques

Sampling is a process of obtaining subjects for a study in a way that it will represent the study population. A sample is a sub-group that is selected from the accessible population. A sample makes it possible, as it may not be possible to deal with the entire population. Sampling is used on a number of cases or observations that have prior determined in statistical analysis. The method of analysis to be performed depend on samples chosen from the entire population. This study used two methods of sampling, in Stratified sampling method; the nurses were first divided into subgroups (or strata) who all shared similar characteristics.

Stratified method of sampling is used when reasonably expected measurements of interest vary between the different subgroups, and where a representation of all the subgroups is ensured. For example, in a research done on asthma results, we may stratify the people under study by gender, to ensure that there is equal representation of male and female. The study sample is further obtained by taking different sample sizes from each stratum. In stratified sampling, it is possible to choose non-equal sample sizes from each stratum. Individuals are entirely chosen by chance and each member of the population has an equal chance, or probability, of being selected in a simple random sampling. One of the ways can include writing numbers pieces of papers, the pieces of papers with numbers are then vigorously shaken and then distributed equally, where

each member of the population picks a paper with a number. The researcher then decides which members of population are to be included in the study.

The study employed two methods of sampling, stratified random sampling method to select nurses from the various hospital departments. The chosen nurses per department were proportionate to the department size. Selection process involved identifying the population, followed by determining the desired sample size then by identifying strata or group for which to represent. Systematic random sampling was used to pick nurses from the departments by selecting every Kth subject from the list of the members of population. A sampling interval was obtained by getting the total population of nurses, which was 405 and divided by the sample size (132). Sampling Interval (N) =total number of nurses (405)/ Sample Size (132) =3. The researcher used the duty rosters as the sampling frame to pick every third nurse on roster. Every Nth nurse who consented participated in the study, where N was the sampling interval. Sampling started from some random point in the population list, and then every Kth individual on the list was taken.

3.8 Data collection tools

The researcher developed a self-administered questionnaire and an observation checklist based on Emergency preparedness manual guideline prepared by the WHO. A questionnaire was the major tool of data collection. The data collection tools (questionnaire and an observation checklist) in this study were formulated from a research database to characterize and estimate the frequency of mass casualty incidents (MCIs) that occurred in the United States in 2010, as reported by Emergency Medical Services personnel (Schenk et al., 2014).

Data collection methods in quantitative research are more structured compared to qualitative research. These data collection methods are able to accommodate various types of surveys, for example, face-to-face interviews, telephone interviews, longitudinal studies, website interceptors, self-completion, and systematic observations. Data collection methods in quantitative studies can be used in large quantities of data. The study employed self-structured questionnaires.

A questionnaire is a form consisting of a series of written or printed Multiple Choice Questions (MCQs) that are closed-ended, the order of questions cannot be changed once they have been written, are economical as they contain many questions that are to be addressed in the study, and the identity of the respondent is unknown. The questionnaires consisted mainly of closed ended questions. The researcher to observe the available components required by the nurses and the hospital as preparedness measures used an observation checklist. Data for the checklist was obtained through direct observation without interacting with the nurses under study of the available facilities, equipment, and supplies to determine if they were available or not. The observation checklist helped in addressing the emergency preparedness measures.

3.9 Data Quality Measures

Reliability and validity are the important parameters used to measure the quality of a measuring instrument in research. The main aim of coming up with an accurate instrument for measuring data is to ensure that errors in the measurement process are kept as minimal as possible.

3.9.1 Validity

Validity is the degree or the accuracy to which results obtained from the analysis of the data actually represent the variables of the study. (Mugenda and Mugenda, 1999).

Validity can be external, where study results can be generalised or applied to the (bigger population) target population or internal validity (speaks to itself) where study results or findings are never generalized, the study results speaks to the study population. In this study, the results employed an internal validity as it was only conducted in Machakos Level 5 Hospital, so the findings/results applied to the nurses and the hospital.

3.9.2 Reliability

Wood et al., 2006) defines reliability as the instrument's ability to consistently and accurately measure the concept under study. Reliability estimates, evaluate the stability of measures, internal consistency of measurement instruments. A pre-test study was performed at the outpatient department of Makueni Level 5 Hospital to measure the reliability of the instruments using the Cronbach alpha coefficient where any value of more than 0.5 indicate that the instruments are valid and gave a good internal consistence during the study before conducting the original research. The questionnaires were tested on a sample of 10 students, ten employees and ten teaching staff members to check and ensure the clarity and applicability of the tools and feasibility of the study, and to estimate the approximate time needed filling the forms. Necessary changes performed according to pre-test results, and the members in the pre-test study were not included in the main study sample. The pre-test also served to assess the reliability of the tool scales through measuring their internal consistency. All items had acceptable internal reliability with Cronbach's alpha (α) coefficient ≥ 0.7 .

3.10 Data Collection Techniques

Structured questionnaires were used where each questionnaire was divided into 4 parts: The first part consisted of the demographic characteristics of the respondents; types of

emergencies received in ML5H; nurses' level of knowledge on emergency preparedness, and the institutional related factors influencing emergency preparedness among nurses at ML5H. The researcher issued the questionnaires in person in order to ensure desired data and accuracy was achieved. 132 questionnaires were issued to 132 nurses. All the 132 questionnaires were filled and collected back. Clarifications were sought in case of any problems.

3.11 Data Management

Researcher checked filled questionnaires for completeness and ensured that all questions were appropriately answered. Once questionnaires were completed, the data collected was systematically arranged according to the codes of the questions to facilitate analysis. The data was stored in a computer. A password was used to secure the database while the questionnaires were locked in a cabinet.

3.12 Data Analysis

Data from questionnaires was extracted for further manipulation and interpretation, was coded by assigning a number, cleaned to fulfil the analysis conditions and data set entered and analysed using a statistical software- IBM SPSS package version 25. IBM SPSS application can be used to perform statistical operations to include, data cleaning, coding, and data entry. SPSS is also capable of analysing a wide scope as well as large amounts of data. Descriptive statistics were used to summarize and describe data into frequencies and percentages. Chi square test was applied since two categorical values from single population was used to determine whether there was a significant relationship between the two variables. Relationships between nurses' knowledge and actual practice/ relationships between institutional related factors and emergency preparedness were tested using Chi square. Results were presented in pie charts, bar charts and frequency tables.

3.13 Ethical Consideration

Prior to beginning the research process of collecting data, there are fundamental principles of ethics that must be applied. An informed consent is one of them. According to Armiger: "in an informed consent the person participating in the study freely gives his or her permission to participate in the study. Beneficence (do no harm) meaning that the research should serve to benefit the participant, add value to his or her life and promote their welfare and should not be the one that causes harm to them. The benefits provided should be much more than the risks. Principle of autonomy means that the participant has the freedom to take part in a research study with the required knowledge on what is being investigated and without the fear of being forced.

The participant has the right to self-determination where he or she can ask questions or deny to produce an information. The principle of justice contains the right to fair privacy where the researcher should not intrude in to the participant's personal issues and fair treatment, which means there is no discrimination in choosing of participants, no penalty to any of the participants who refuse or withdraws from research. In justice, all the agreements between the researcher and the participant have to be honoured. Physical risks brought about by the procedures of research carried on participant need to avoided. Psychological risks that could lead to negative effects like stress, or feeling of well-being have to be avoided as well. Avoid social risks that may label the subject in a way that give disrespect.

American Nurses Association (ANA) suggests that, anonymity is protected when the subject's identity is not exposed. For example, the name of the subject is not written or linked with personal responses. The researcher has to address confidentiality, where he or she treats personal information with privacy to protect the subject's identity. Levine

states that an individual possesses the freedom to decide if to give information or not to the person he or she wishes. According to Levine, "privacy is the freedom an individual has to determine the time, extent, and general circumstances under which private information will be shared with or withheld from others ".

Kelman believes that an invasion of privacy happens when private information such as beliefs, attitudes, opinions and records, is shared with others, without the patient's knowledge or consent. However, the American Nurses Association says that different persons may hold different opinions about when privacy is invaded. A researcher cannot decide on behalf of other persons on those delicate issues. All aims, instruments and methodology must be discussed with the prospective subject and the research workers prior to the investigation. The study met ethical considerations. Certificate of Ethical clearance (Ref. No.MKU/ERC/1037) from Mount Kenya University, National Commission for Science, Technology and Innovation (NACOSTI) permit No: NACOSTI/P/18/77236/26397. Additionally, research authorization (Ref: MOH/MKS/RSRCH) VOL.1/25) from the County Director of Health, Machakos County.

Participation in the study was voluntary and the respondents were given a choice to participate or not and informed consent was sort before they participated in the study. The respondents were assured of confidentiality, as the information was not disclosed at any level of data collection process. No harm or discomfort to the participants as the only activity was to fill up the questionnaire and no procedures that were carried on to the participants. The selection of the participants was fair according to Burns & Grove, (2011). It was made clear to the participants that, they feel free to withdraw from the study at any point or time; they would not be forced or coerced to participate in the

study. Anonymity was maintained through all stages of the study as no identity of the participants was revealed. This was a low risk study, hence no ethical concerns identified.

3.14 Summary of the Methodology

The study was quantitative using a descriptive cross –sectional design conducted among 405 nurses working at ML5H. Selection of respondents was done using stratified random sampling coupled with systematic random sampling. Data was coded and entered into SPSS version 25 software for analysis. Descriptive statistics was used to summarize and describe data into frequencies and percentages. Chi square test was used to determine whether there was a significant association between the variables. Results were presented in pie charts, bar charts and frequency tables.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter presents the study results after analysis of the data collected using SPSS version 25. The findings or results contain demographic information of the respondents; respondents' responses, depending on the study objectives that included; the types of emergencies received in ML5H, the level of knowledge among nurses in ML5H, and the institutional related factors influencing emergency preparedness among nurses in ML5H. The response rate was 98.5%. A P value below ($<$) 0.05 was considered statistically significant while a value above ($>$) 0.05 was considered statistically non-significant.

4.1 Demographic characteristics of the respondents

Table 1 below describes the social demographic characteristics of respondents. Majority of the respondents, 84(64%) were female while 48(36%) were male.

Regarding the age distribution of the respondents, more than half (59%) reported they were aged 21-30 years, 30(23%) were aged 31-40 years, 14(11%) were aged 41-50 years, while 10(7%) were aged 51-60 years.

Three quarters (70.5%) of the respondents had gone up to diploma level, 35(26.5%) had gone up to degree level while 4 (3%) had gone up to certificate level.

The study showed that nearly a half, (40.5%) of the respondents worked in other specialties, 28(20.1%) had specialized in Intensive care (ICU) and Renal units, 22(16.7%) specialized in theatre, 26(19.7%) specialized in Pediatrics and newborn units.

Nearly a half (44%), of the respondents had worked for 1-5 years, 23(17%) had less than one year experience, 20(15%) had 6-10 years' experience, 10(8%) had 16-20 years, 7(6%) had more than 30 years' experience, 7(5%) had 11-15 years' experience while 7 (5%) had an experience of 21-30 years.

Less than a quarter (21%) of the respondents worked in obstetric unit, 25(19%) worked in accident and emergency unit, 25(19%) worked in surgical/medical unit, 55(41.7%) worked in theatre, psychiatry, Renal and Intensive care units.

Table 2: Social Demographic Characteristics of the Respondents

Characteristic	Frequency(n)	Percent (%)
Gender		
Male	48	36.4
Female	84	63.6
Total	132	100
Age		
21-30	78	59.1
31-40	30	22.7
41-50	14	10.6
51-60	10	7.6
Total	132	100
Academic qualification		
Certificate	4	3
Diploma	93	70.5
BScN	35	26.5
Total	132	100
Work experience		
<1 year	23	17.4
1-5 years	58	43.9
6-10 years	20	15.2
11-15 years	7	5.3
16-20 years	10	7.6
21--30 years	7	5.3
>30 years	7	5.3
Total	132	100
Area of specialization		
ICU/ Renal	28	20.1
Paediatrics/NBU	26	19.7
Theatre	22	16.7
Other	56	40.5
Total	132	100
Area of work		
	27	20.5
Obstetrics	25	18.9
Accident and emergency unit	25	18.9
Surgical/medical unit	55	41.7
Psychiatry/Theatre/Renal/ICU		
Total	132	100

4.2 Types of Emergencies received in ML5H

Most of the nurses agreed to a likelihood of man –made emergencies occurring 121(91.7%); food poisoning 111(84.1%); fire tragedies 106(80.3%); disease epidemics 100(75.8, and chemical spillages 56(42.4%) were the major emergencies received in the hospital. Most of the nurses in ML5H dismissed any likelihood of a natural disaster occurring in the hospital 108(82%) as compared to 24(18.2%) who agreed as shown in Figure 2 below.

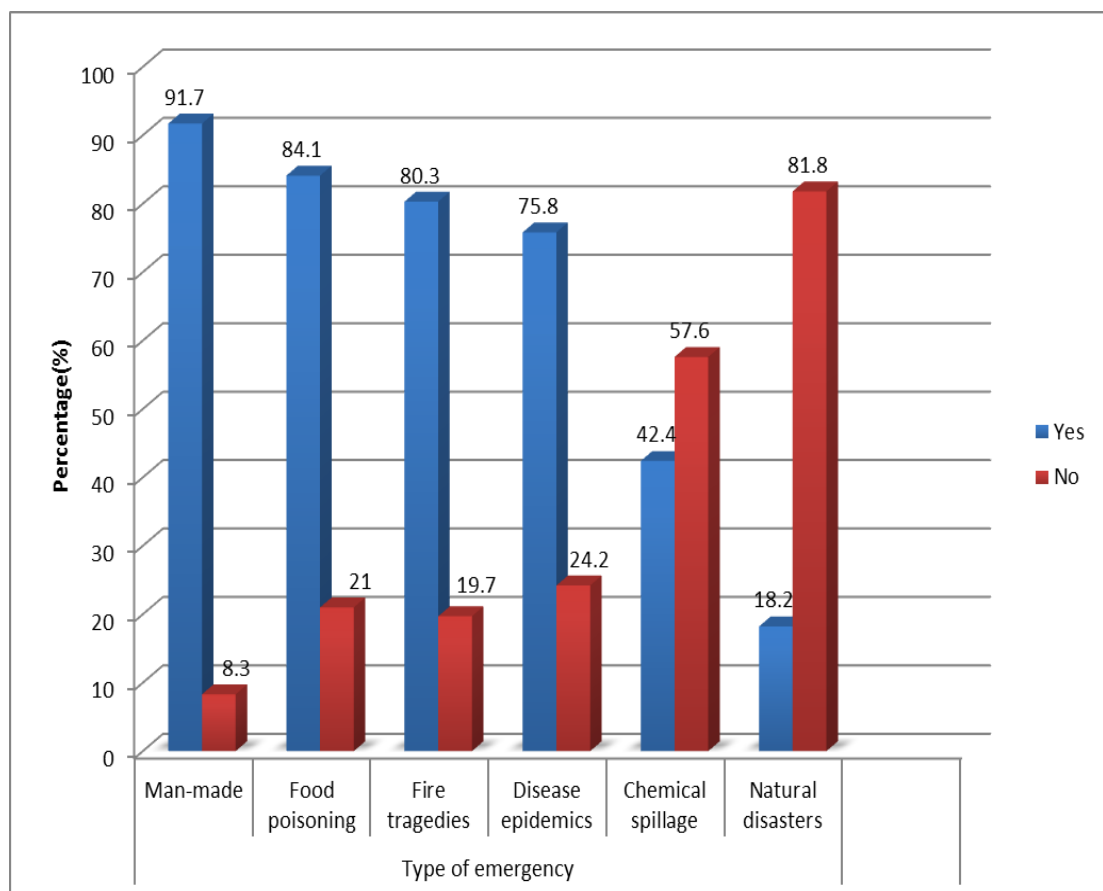


Figure 2: Bar Chart Showing the Types of Emergencies Encountered in ML5H

4.3 Knowledge on emergency preparedness

4.3.1 Training on emergency preparedness

The study sought to establish whether respondents had attended trainings on emergency preparedness, more than a half (65%) had attended trainings of emergency

preparedness while 46(35%) reported they had not attended trainings on emergency preparedness as shown in Figure 3 below.

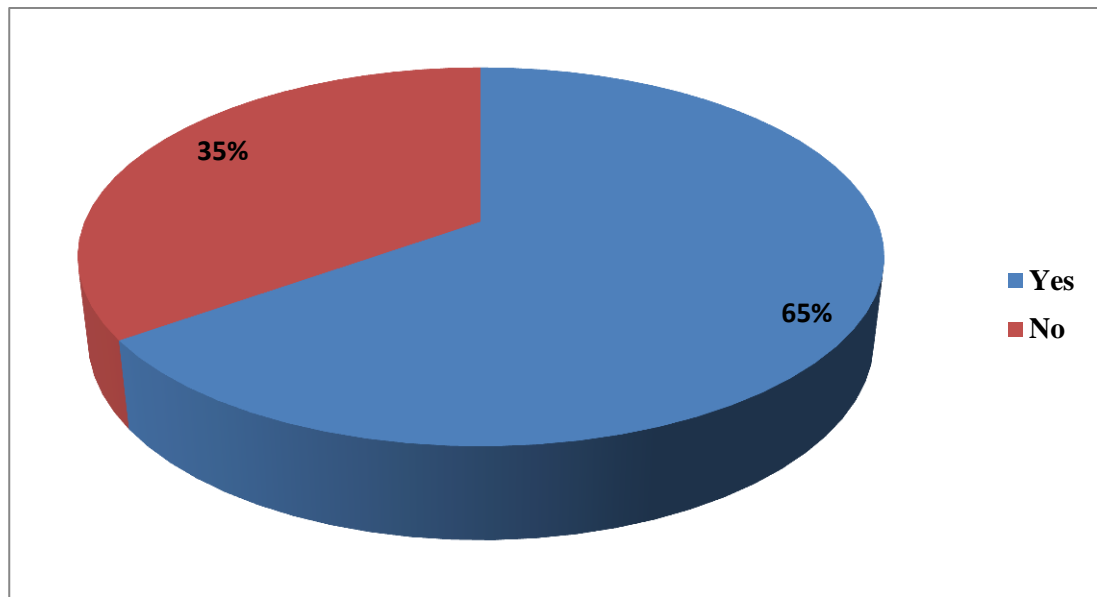


Figure 3: Training on emergency preparedness

The study further established that, more than a half (53.1%) of the respondents were trained on BLS / ACLS while 62(46.9%) were not.

The study showed that out of those who trained on emergency preparedness, nearly three quarters (69%) trained in college; 18(13.6%) in seminars; 18(13.6%) on job; 3 (2.3%) through MOH emergency preparedness trainings, and 2(1.5% trained in other places.

In relation to the last emergency preparedness training attended, more than a quarter (37%) had not attended any training; 37(28%) had attended more than two years ago; 24(18%) in the last twelve months while 22(17%) had completed one to two years after their last emergency preparedness training.

Respondents were asked whether emergency preparedness training enhanced their competencies. Nearly three quarters (63%) of the respondents reported that, the training

enhanced their competence while 48(36%) indicated that the training had not enhanced their competence.

Table 3: Emergency preparedness training among nurses in ML5H

	Frequency(n)	Percent (%)
Ever trained on BLS/ACLS		
Yes	70	53.1
No	62	46.9
Total	132	100
Where trained on emergency preparedness		
College	91	69.0
Seminar	18	13.6
On job training	18	13.6
MOH emergency preparedness training	2	1.5
Other	3	2.3
Total	132	100
When last training was attended		
Last 12 months	22	17
Between 12 months-2 years	24	18
More than 2 years	37	28
Not had any training	49	37
Total	132	100
Training enhances nurse competencies		
Yes	84	64
No	48	36
Total	132	100

4.3.2 Nurse self-rated Level of knowledge on emergency preparedness

The study showed that, three quarters (76%) of the respondents rated their knowledge on emergency preparedness as good and very good while 32(24%) rated their knowledge as average and below as shown in Figure 4 below.

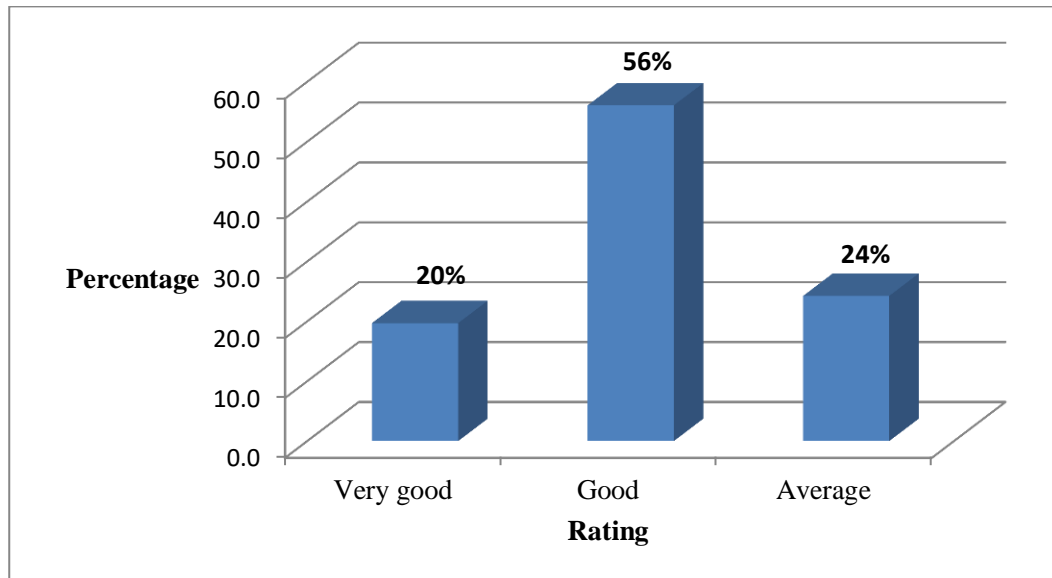


Figure 4: Nurse self-rated level of knowledge on emergency preparedness

4.3.3 Knowledge on Emergency management

Table 4 below presents results indicating respondents agreement to certain interventions as measures of emergency preparedness. The results showed that, more than a half (61%) of the respondents understood the emergency preparedness plan while 52(39%) did not understand the emergency preparedness plan.

Respondents were aware of procedures to perform during emergencies, more than three quarters of the respondents (77%) said they were familiar with the procedures while 30 (23%) were not familiar with the procedures during emergencies.

The study sought to establish whether respondents had knowledge on emergency crash cart in their work setting. Nearly three quarters (70%) reported to be familiar with the emergency crash cart while 40(30%) were not familiar with the emergency crash cart.

Study findings showed that, respondents were familiar with the triaging technique during emergencies. More than three quarters (79%) indicated they were familiar with the technique while 28(21%) were not familiar with the triaging technique.

Table 4: Knowledge on emergency management among nurses in ML5H

	Frequency(n)	Percent (%)
Understanding of emergency management plan		
Yes	80	61
No	52	39
Total	132	100
Familiarity with procedures during emergencies		
Yes	102	77
No	30	23
Total	132	100
Familiarity with emergency crash cart		
Yes	92	70
No	40	30
Total	132	100
Familiarity with the triaging technique		
Yes	104	79
No	28	21
Total	132	100

4.4 Level of Emergency Preparedness

The researcher used an observation checklist in Table 5 below without directly interacting with the people under study. The aim of the checklist was to assess the measures undertaken at Machakos Level 5 Hospital to prepare for emergencies. The observation checklist showed that there was availability of; hospital emergency/disaster plan, emergency response team, emergency response packs, triage team, triage flow charts in the departments, a resuscitation team, an emergency crash cart, adequate waiting and receiving areas for casualties, updated inventory of resuscitation equipment, supplies and pharmaceuticals, personal protective equipment, and firefighting equipment which indicated that measures had been availed to handle emergencies. The observation checklist also showed that, some measures had not been put in place to prepare for emergencies. These included; performance of regular disaster/emergency preparedness drills, and fire exits.

Table 4 below showed that out of the 12 emergency preparedness measures observed, 10 of them were available. This represented more than three quarters (83.3%) of the emergency preparedness measures. The Table also showed that out of the 12 emergency preparedness measures observed; only two were not available. This represented less than a quarter (16.7%) of the emergency preparedness measures.

Therefore, results from Table 5 below showed that more than three quarters (83.3%) of emergency preparedness measures were available while less than a quarter (16.7%) of emergency preparedness measures were not available. This proved that the nurses and the institution were prepared for emergencies.

Table 5: Level of Emergency Preparedness

Emergency Preparedness Measures	Available
Hospital disaster plan	Yes
Emergency Response Team	Yes
Regular disaster/emergency preparedness drills	No
Emergency response packs	Yes
Triage team	Yes
Triage flow charts in the departments	Yes
Resuscitation team	Yes
Updated inventory of resuscitation equipment, supplies and pharmaceuticals	Yes
Personal protective equipment	Yes
Adequate waiting and receiving areas for casualties	Yes
Fire fighting equipment	Yes
Fire exits	No

4.5 Membership with Emergency Response Team

From the study results in Table 6 below, two-thirds (68%) of the respondents were not members of the emergency response team while 42(32%) were members of the emergency response team.

Table 6: Membership with Emergency Response Team

	Frequency (n)	Percentage (%)
Yes	42	32
No	90	68
Total	132	100

4.6 Participation in Emergency Drills

Study results in Figure 5 established that, nearly three quarters (68%) of the respondents had not participated in emergency preparedness drills while 42(32%) had participated.

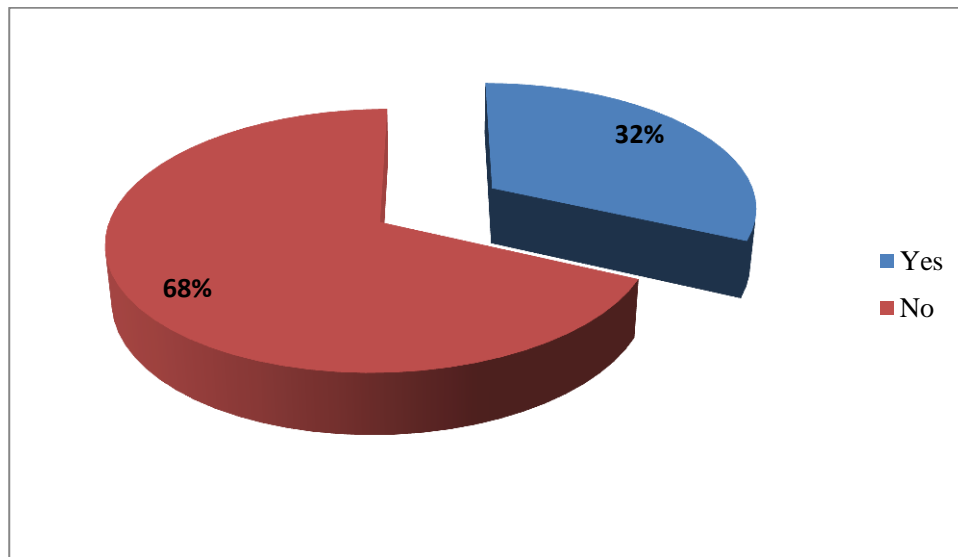


Figure 5: Participation in Emergency Drills

4.7 Institutional related factors influencing emergency preparedness

Table 7 below shows how the hospital management supported emergency preparedness. Two-thirds (79.5%) of the respondents reported that the hospital

administration recognized emergency management plan as a framework for quality nursing care delivery while 27(20.5) did not.

More than two-thirds (90.2%) of the respondents reported of the hospital administration supporting the emergency response team while 13(9.8%) reported that the hospital administration did not support the emergency response team.

The study results shows that, nearly three quarters (70.5%) of the respondents reported the hospital administration of regularly reviewing the contents of emergency management plan while 39(29.5%) of the respondents said the hospital administration did not review the contents of the emergency management plan.

More than a half (62.1%) of the respondents indicated that the hospital administration did not support trainings for nurses while 50(37.9%) indicated there were emergency management trainings for nurses.

Nearly two-thirds (74.2%) of the respondents reported there was existence of equipment relevant to enable nurses prepare for emergencies while 34(25.8%) reported of the nonexistence of relevant equipment for emergency preparedness.

Three quarters (76.5) of respondents reported that the hospital management did not performed regular emergency drills in the hospital while 31(23.5%) reported of the availability of regular drills in the hospital.

The study results established that more than two-thirds (86%) of respondents reported of the availability of personal protective equipment (PPE) in case of any infectious disease outbreak while 18(13.6%) reported of no PPE in case of infectious disease outbreaks.

In relation to existence of an adequate evacuation plan and exit doors, more than three quarters (81.8%) of respondents reported that the hospital management ensured existence of such plan while 24(18.2%) said there was no adequate evacuation plan and exit doors.

Table 7: Institutional related factors

Statement	Response	Frequency	Percentage
Hospital administration recognized emergency	Yes	105	79.5
Management plan as a framework for quality nursing care delivery.	No	27	20.5
Hospital administration supported emergency response Team	Yes	119	90.2
	No	13	9.8
Hospital administration regularly reviewed the contents of emergency management plan	Yes	93	70.5
	No	39	29.5
Hospital management supported training of nurses on Emergency management	Yes	50	37.9
	No	82	62.1
Institution supplies the relevant equipment for Emergency Preparedness	Yes	98	74.2
	No	34	25.8
Administration regularly performs emergency drills	Yes	31	23.5
	No	101	76.5
Hospital administration avails PPE in case of an infectious disease outbreak	Yes	114	86.4
	No	18	13.6
Hospital administration has ensured adequate evacuation plan and exit doors	Yes	108	81.8
	No	24	18.2

4.8 Level of knowledge and association with emergency preparedness

From the study results in Table 8 below shows that, a higher proportion 100(76%) of respondents rated their knowledge as good and very good. This indicated that they were more likely to handle emergencies competently, compared to those who rated their knowledge as average and below 32(24%). Statistical tests performed showed a significant relationship between level of knowledge and emergency preparedness ($P=0.000$).

From the study findings, more than a half (63.6%) of the respondents were familiar with the procedures during emergencies while 48(36.4%) were not. The statistical tests performed showed a significant relationship between familiarity with procedures and emergency preparedness ($P=0.000$).

Nearly two-thirds (63.6%) of the respondents were familiar with the emergency crash cart while 48(36.4) were not. Statistical tests performed showed a significant association between familiarity with emergency crash cart and emergency preparedness ($P=0.000$).

More than one-half (62.9%) of respondents were familiar with the triaging technique while 49(37.1%) were not. The study findings showed that there was no significant relationship between familiarity with triaging technique and emergency preparedness ($P=0.283$).

Table 8: Association between level of knowledge and Emergency preparedness

	Emergency preparedness		Significance		
	Yes	No	(χ^2)	Df	Pvalue
Self-rated knowledge on emergency preparedness					
Very good	24(18.2)	2(1.5)	21.290a	2	0.000
Good	49(37.2)	25(18.9)			
Average and below	11(8.3)	21(15.9)			
Familiarity with procedures					
Yes	75(56.8)	27(20.5)	18.982a	1	0.000
No	9(6.8)	21(15.9)			
Familiarity with crash cart					
Yes	66(50)	26(19.7)	8.614a	1	0.003
No	18(13.6)	22(16.7)			
Familiarity with triaging technique					
Yes	69(52.3)	35(26.5)	2.522a	2	0.283
No	14(10.6)	14(10.6)			

4.9 Institutional factors and the association with Emergency Preparedness

Table 9 below presents the association between emergency preparedness and institutional factors. Among the factors examined, two factors were related to emergency preparedness, namely; hospital administration supports emergency response team (P=0.009) and hospital management regularly reviews the contents of emergency management plan (P=0.002). Other variables which included, hospital administration recognized emergency preparedness plan as a framework for quality nursing care delivery(P=0.154); management supports training of nurses on emergency management(P=0.659); administration regularly performs emergency drills(P=0.068); institution supplies relevant equipment to enable nurses prepare for emergencies(P=0.792); hospital administration avails personal protective equipment in case of infectious disease outbreak (P=0.811); and hospital administration has ensured

adequate evacuation plan and exit doors(P=0.55) were not significantly associated with emergency preparedness.

Table 9: Institutional Factors and the Association with Emergency Preparedness

Statement		Emergency Preparedness		Sig (χ^2)	Df	Pvalue
		Yes	No			
Hospital administration recognizes emergency preparedness as a framework for quality nursing care.	Yes	70(53)	35(26.5)	2.037a	1	0.154
	No	14(10.6)	13(9.8)			
Hospital administration supports Emergency Response Team.	Yes	80(60.6)	39(29.5)	6.732a	1	0.009
	No	4(3)	9(6.8)			
Hospital management regularly reviews the contents of emergency management plan.	Yes	67(50.8)	26(19.7)	9.613a	1	0.002
	No	17(12.9)	22(16.7)			
Hospital management supports training of Nurses on emergency management.	Yes	33(25)	17(12.9)	0.194a	1	0.659
	No	51(38.6)	31(23.5)			
Institution supplies relevant equipment for Emergency preparedness	Yes	63(47.7)	35(26.5)	0.069a	1	0.792
	No	21(15.9)	13(9.8)			
Administration regularly performs emergency Drills	Yes	24(18.2)	7(5.3)	3.326a	1	0.068
	No	60(45.5)	41(31.1)			
Hospital administration avails PPE in case of infectious disease outbreak.	Yes	73(55.3)	41(31.1)	0.057a	1	0.811
	No	11(8.3)	7(5.3)			
Hospital administration has ensured adequate evacuation plan and exit doors.	Yes	70(53)	38(28.8)	0,356a	1	0.55
	No	14(10.6)	10(7.6)			

4.10 Summary of the Study

In conclusion, the results showed that more than three quarters (83.3%) of emergency preparedness measures were available while less than a quarter (16.7%) of emergency preparedness measures were not available. This indicated that the nurses and the institution were prepared for emergencies. The true value is unlikely to be zero, so I could state that the result was statistically significant at the 5% level ($P < 0.05$). Therefore, since the P-value is < 0.05 , the result is in the unlikely region of alternate

hypothesis, which proposed that, there was a statistically significant relationship between nurses' level of knowledge and actual practice at Machakos Level 5 Hospital.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The purpose of this study was to assess emergency preparedness among nurses at Machakos level 5 hospital. The researcher intended to determine the types of emergencies in the hospital; assess the level of knowledge on emergency preparedness among nurses; and determine institutional factors that influence emergency preparedness among nurses.

5.1 Summary of the Results and Findings

5.1.1 Demographic characteristics of the respondents

The study results showed that more than a half (64%) of the respondents were female while 36% were male. The findings are similar to the countrywide health surveys conducted in Kenya, which showed there were more female healthcare workers than male (KDHS, 2014). The study established that 72% of the respondents worked in other specialties such as surgical wards, 8% worked in ICU, 8% worked in theatre, 2% worked in renal unit while 5% worked in newborn unit. This showed that three quarters of respondents worked in areas dealing with emergencies. In relation to the age distribution of the respondents, more than a half (59%) reported they were aged 21-30 years, 23% were aged 31-40 years, 11% were aged 41-50 years while 7% were aged 51-60 years. This showed that more than a half the respondents were still young and energetic to handle emergencies fast and effectively. These statistics also indicated that majority of the respondents in this age bracket had recently completed their training and their knowledge on emergency preparedness was still up to date and could apply their skills efficiently in handling of emergencies once they occurred.

The study further established that, less than a quarter (20.5%) of the respondents worked in obstetric unit, 19% worked in accident and emergency unit, 13% worked in pediatric unit, 10% worked in surgical unit, 9% worked in theatre, 8% worked in ICU. This meant that, respondents worked in those departments of the hospital where emergencies were commonly managed and also, this indicated that the respondents were prepared for emergencies. With regards to the working experience of respondents, 44% had worked for 1-5 years, 17% had less than one year experience, 15% had 6-10 years' experience, 8% had worked for 16-20 years, 6% had worked for more than 30 years, 5% had worked for 11-15 years while 5% had worked for 21-30 years. This finding indicated that, nearly a half (44%) of the nurses had a good working experience which could have allowed them achieve good exposure to emergencies. It was established that nearly two-thirds(70.5%) of the respondents had gone up to diploma level, 26.5% had gone up to degree level while 3% had achieved certificate level of education. In addition, the study showed that, more than a half (68%) of the respondents were not members of the emergency response team while 32% were members of the emergency response team. This showed a big gap since membership with emergency response team guaranteed members frequent training opportunities on emergency preparedness.

5.1.2 Types of emergencies received in the hospital

Regarding to Emergencies caused by natural causes, three quarters (82%) of respondents had not encountered emergencies due to natural causes while (18%) indicated they had encountered the emergencies after natural disasters. However, the study further established that 92% of the respondents had encountered emergencies due to man-made events such as accidents while 8% had not encountered such emergencies. This finding revealed that most of the nurses received emergencies due to man-made

occurrences than the natural disasters. A similar study by Zhang (2018) states that, healthcare personnel should be ready for emergencies whether they are caused by natural or man-made events. Concerning emergencies caused by disease epidemics, two-thirds (76%) of respondents indicated that they had encountered such emergencies while a significant 24% had not encountered emergencies due to disease epidemics. Similarly, World Health Organization recommends all healthcare providers to be familiar with management of emergencies due to disease epidemics.

Regarding emergencies caused by chemical spillage, more than a half (58%) of the respondents had never encountered emergencies due to chemical spillage while 42% indicated that they had encountered emergencies caused by chemical spillage. The study also showed that 84% of the respondents had encountered emergencies due to food poisoning while 16% had never encountered emergencies due to food poisoning. This showed that, a significant proportion of the respondents were not exposed to emergencies due to chemical spillage and food poisoning. Food poisoning was considered a potential threat by three quarters (84.1%) of the respondents. A similar finding by Gathura (2013) agrees to a study carried out in KNH and published in the African Journal of Food Science and Technology. Chemical spillage was considered a potential threat with 42.4% of the respondents. This is in accordance to KNH, (2012) which agrees to a safety and audit report carried out at KNH in 2012. The study sought to establish whether respondents had encountered emergencies caused by fire tragedies. Two-thirds (80%) of the respondents indicated they had encountered such emergencies while 20% had never encountered emergencies caused by fire tragedies. This study shows that although most respondents were exposed to emergencies, a significant proportion lacked exposure that could be critical in emergency preparedness. These findings are controversial to a study done by Christopher (2017) who pointed out the

need for healthcare workers to being exposed to emergencies so that they can handle them effectively in future.

5.1.3 Level of knowledge on emergency preparedness

The study established that three quarters (76%) of the respondents rated their knowledge on emergency preparedness as good and very good, 24% rated their knowledge as average and below. This shows that all the respondents reported of having the necessary knowledge on emergency preparedness. About training on emergency preparedness, more than half (65%) of respondents reported of having attended training on emergency preparedness while 35% had not attended any training on emergency preparedness. For those who trained on emergency preparedness, more than a half (58.5%) trained on emergency preparedness in college, 14% trained through seminars, 14% on job trainings, 1.5% through MOH trainings while 3% trained through other trainings. This finding concurs with Naser (2018) who conducted a study and inferred that nurses rate themselves as having necessary knowledge on emergency preparedness and that most were trained on emergency preparedness.

The study further established that more than a half (53%) of the respondents were trained on BLS/ACLS while 47% were not trained on BLS/ACLS. This showed that although majority of the respondents had been trained on these emergency skills, a significant proportion had not been trained. Respondents were asked whether emergency preparedness training enhanced their competencies. Nearly three quarters (63%) of respondents indicated that the training attended enhanced their competence while 36% indicated the training did not enhance their competence. The study established that two-thirds (68%) of the respondents had not participated in emergency preparedness drills while 32% participated in the emergency drills. This finding agrees

with Shakeri (2018) who pointed out that nurses need to possess adequate skills in emergency preparedness. Regarding familiarity with emergency procedures, 77% of the respondents reported they were familiar with the procedures during emergencies while 23% were not familiar with the emergency procedures.

In addition, 70% of respondents were familiar with the crash cart while 30% indicated they were not familiar with the crash cart. More than a half (61%) of respondents understood the emergency preparedness plan while 39% did not understand the emergency preparedness plan. In relation to reading of emergency plan, more than a quarter (40%) of the respondents had not read the emergency plan, 52% had read the plan with understanding role while 8% had read the plan without understanding role. Further, 79% of respondents were familiar with triaging technique while 21% were not familiar with triaging technique. These finding concurs with Paton (2015) who conducted a study and concluded that majority of nurses have knowledge on emergency procedures and emergency plans. However, there is need for more emphasize and sensitization about the crash carts and triaging technique. On when the last emergency training was attended, more than one-third (37%) had not attended any, 28% had attended training more than two years ago, 18% had attended training in the last twelve months while 17% attended one to two years after their last emergency training. This showed that the nurses did not attend regular trainings that were essential for emergency preparedness. This statement agrees with Ibrahim (2014); Nilsson et al., (2016) that nurses should have the requisite knowledge and skills to handle emergencies at every stage of emergency management.

It is important for the body that regulates nursing services to be advised on the positive side of putting into emphasize to courses related to emergency preparedness measures.

These findings on the lack of emergency drills and exercises put emphasis on hospitals and other healthcare settings to implement policies that address a lack of preparedness among their employees. Doing so will create a more confident and prepared workforce that will in turn respond more effectively to an emergency. The finding where the respondents reported of rating their preparedness as good and very good was due to previous exposures to emergencies, this highlights the benefit of further research to harness the knowledge gained from nurses who have responded to actual emergency events for the benefit of the nursing profession as a whole.

5.1.4 Institutional Related Factors Influencing Emergency Preparedness

The study established to find out if the hospital had an emergency management plan, two-thirds (79.5%) of the respondents knew the hospital had an emergency management plan while 20.5% did not know of the presence of emergency management plan. The study further established that three quarters (70.5%) of the respondents were familiar with the contents of emergency management plan while 29.5% were not familiar with the contents of emergency management plan. In controversy to a study done by Tomruk (2012), significant proportions of nurses were not aware of emergency management plan. In relation to being aware of the existence of emergency response team in the hospital, two-third (90%) of respondents were aware while 10% were not aware of the existence of an emergency response team. Regarding whether the hospital had emergency trainings for all nurses, more than a half (62%) of the respondents indicated the hospital did not have trainings while 38% indicated there were emergency management trainings for the nurses. This finding showed that even though there were trainings on emergencies in the hospital, majority of the nurses were unaware of such trainings.

Study findings disagree with Waldhorn and Franco (2019) who indicated that, trainings should benefit all the nurses because they directly handle emergency cases. Concerning the existence of relevant equipment for handling emergencies, 74% of the respondents reported of the existence of relevant equipment necessary for emergency preparedness while 26% reported of no existence of relevant equipment for emergency preparedness. Respondents were also asked about the existence of regular emergency drills in the hospital. Two-thirds (76.5%) reported Of no regular emergency drills while 23.5% reported there were regular drills provided by the hospital. This indicated that the institution lacked a clear way of encompassing all nurses who participated in emergency drills at Machakos Level 5 Hospital. The study findings showed that nearly a half of the nurses (45.5%) reported that drills were not performed at the hospital, while 24(18.2%) reported that drills were performed in the hospital. A similar study concurs with Schneid, (2010) who suggested that, emergency drill evaluations then could help hospitals to improve their level of emergency preparedness.

Research from Wong et al., (2016) suggested that the idea of having emergency drills and exercises helped in identifying strengths and weaknesses on healthcare professionals regarding emergency preparedness. Wong further adds that, the approach was helpful in addressing the gaps by providing further trainings and simulations in readiness for emergencies. A report done in Hawaii concluded that, to be adequately and efficiently prepared for emergencies, proper coordination is important, with timely decision making effort in attempt to reduce the negative effects on human beings and prevent further damage that could be harmful to the people affected. Study findings agree with Adelman and Legg, (2020) that, emergency plans are very essential and provide the framework for emergency response. This gives quality nursing and

individualized care to the victims as triaging has to be carried out and provide care as per the needs and in order of priority to safeguard life.

Adelman further adds that, these plans without practice and drills are worthless as healthcare providers should keep embraced or updated on the knowledge and skills required for emergency preparedness at all times. A finding concurs with Coppola (2016) that, drills should be tested and reviewed regularly. Testing drills may require extra costs, so healthcare facilities should be in a position to plan and allocate funds for drill activities. The study sought to establish whether personal protective equipment(PPEs) were available in case of infectious diseases, three quarters (86%) of the respondents that PPEs were available while 14% indicated PPE were not available.

World Health Organization points out that healthcare providers should identify with different PPE used in emergencies and know about their availability. About an existence of an adequate evacuation plan and exit doors, two-thirds (82%) of respondents reported of an existence of such plan while 18% reported there was no adequate evacuation plan and exit doors. The study concurred with the findings of ISDR (2017) which stated that emergency plans are important tools that help in reducing or mitigating measures that prevent emergencies. Emergencies deplete resources in a hospital and this call for proper planning of the resources available. This is because emergencies cause shortage of resources needed by health care facilities in developing countries. The study finding also established that there exists an emergency response team in the facility though; most of the nurses at Machakos Level 5 hospital are not members of the emergency response team. Warfield argues that, there is need for a long-term solution to reducing the effects of emergencies that are achieved by the administrations prioritizing all that is involved in emergency preparedness.

Similarly, Warfield's argues that, health care facility support on emergency management is critical in the emergency preparedness among nurses at Machakos Level 5 hospital. Additionally, training programs related to emergency management can be planned and provided to healthcare workers as they help in improving response to emergencies. The study also showed that there were insufficient infrastructures at the Machakos Level 5 hospital to handle emergencies. The study findings at Machakos level 5 Hospital showed that, there were no adequate equipment for fighting fire, and evacuation plans together with emergency exit doors were insufficient. The above statement concurs with a Statutory Safety and Health Audit carried out at Kenyatta National Hospital in August 2012. During the audit, it was noted that both the fire Hose Reels and Hydrant system were out of order and no alternative was in place (KNH, 2012).

5.1.5 Level of Emergency Preparedness

The observation checklist showed that, there exists a hospital disaster/emergency plan, emergency response team, emergency response packs, triage team, triage flow charts in the departments, a resuscitation team, an emergency crash cart, adequate waiting and receiving areas for casualties, updated inventory of resuscitation equipment, supplies, and pharmaceuticals, personal protective equipment, and firefighting equipment which were good indicators of preparedness for emergencies. The observation checklist also showed that a few of the emergency preparedness measures were not available like regular disaster/emergency preparedness drills and fire exits. From the study results, three quarters (83.3%) of the emergency preparedness measures were available while 16.7% of the emergency preparedness measures were not availability.

The Emergency Preparedness Program aims at educating healthcare professionals on emergency preparedness and how to handle disasters and emergencies once they strike. The program provides the necessary leadership skills by enabling team leaders to allocate roles and responsibilities when attending to emergencies. The program ensures there is a standard way to handling emergencies by putting in place standard operating procedures across the board. A similar finding by Yeatts et al., (2015); Ardalan (2013) states that, healthcare facilities should be capable of ensuring that there are adequate facilities including supplies and equipment in order to meet and address the unforeseen events. One of the key criteria for hospital readiness involves having a comprehensive emergency plan, which comprises of a comprehensive assessment to identify the most likely threats to a particular hospital.

To avoid the impact of emergencies on hospitals, it is vital that hospitals have appropriate emergency management strategies to mitigate the adverse impacts. To avoid the impact of emergencies on hospitals, it is important that they have appropriate emergency management preparedness measures to help reduce the harmful effects of emergencies. The goals of a comprehensive hospital emergency plan are to: enable the hospital to effectively manage an emergency, provide continuity of basic societal functions, minimise the physical damage to a hospital, as well as minimise loss of life, injury or illness of hospital personnel and human suffering of the persons affected (Kaji, 2016). Similarly, Koeing and Schultz (2010) add that, comprehensive hospital emergency plan includes all the necessary equipment, supplies, personnel required in the emergency management process. Nevertheless, it is important not to regard the plan as the entire essence of emergency preparedness, but rather as one essential element in a spectrum of activities (Adini et al., 2012). Having an emergency plan does not equal

to complete preparedness (Kaji & Lewis, 2016) however; a comprehensive emergency plan is considered the backbone of a hospital's preparedness.

One important aspect of a comprehensive emergency plan is an all-hazards approach, which refers to the consideration of any incident or event that could pose a threat to human life, property or the environment (ASTM, 2019). Providing immediate response, systems self-staff training, and ultimately respond to the needs when the emergency occurs is the purpose of hospitals preparation. To enhance the readiness of hospitals to deal with emergencies, it is important to focus on internal programming and if necessary, its expansion on the waiting and receiving areas. Healthcare facilities with programs that focus on adequate preparation during emergencies are better positioned because when emergencies strike, they never experience the full impact of a disastrous incident. They have a coordinated and a well-managed way of approaching to any kind of a harmful event.

Monitoring mortality, survival increasing and complications reduces the higher chances of the victims getting disabilities and preventing injuries that could further complicate into permanent disabilities that cannot be reversed. JCAHO conversely recommends that, hospitals must provide drills and exercises to healthcare providers on a regular basis to ensure preparedness. JCAHO further add that, hospitals must come up with a plan indicating evacuation areas with clear arrows showing the entry and exit doors. Hospitals must prepare for special emergencies such as floods, firearms and explosives, accidents due to chemical spillages, and the likelihood of any disease outbreak. Proper preparedness measures have to be put in place to deal with families and healthcare workers in case of an infectious disease outbreak which are capable of spreading within a very short period of time. An emergency management committee should be formed,

be ready for emergencies and functional at all times in case of an emergency occurring. Nurses should incorporate themselves and be part of emergency management plan of the hospital. This will ensure that, the management is well advised on the relevant components that are of priority when preparing for any emergency.

5.2 Conclusion

The types of emergencies in Machakos level 5 hospital included emergencies caused by natural disasters such as floods and earthquakes, emergencies due to man-made occurrences such as road accidents, emergencies due to chemical spillage, fire tragedies and food poisoning. The study concluded that nurses in the hospital had knowledge on emergencies they had received in the hospital.

Majority of the nurses had the necessary knowledge and had attended trainings on emergency preparedness and indicated that the trainings enhanced their competencies. In addition, majority had knowledge on emergency procedures and triaging. However, a high proportion of nurses reported of not participating in emergency drills that could be used to improve their knowledge and skills on emergency preparedness. From the study results, it was found that nurses were inadequately prepared for emergencies. The study findings concluded that nurses who had prior experience emergencies handled emergencies effectively, made informed decisions concerning the actions and measures to take during emergencies.

Majority of the respondents reported that they were not aware whether the hospital carried out emergency drills and emergency trainings for all nurses. The researcher also noted that although the nurses knew of the existence of an emergency response team in the hospital, a significant proportion did not know of its existence. A study finding agrees with Ibrahim (2014); Nilsson et al. (2016) that, emergency exercises and drills

have been found to be of high importance in preparing nurses for emergencies. Following the rate at which emergencies are occurring, periodic and frequent emergency trainings are essential to adequately prepare nurses to respond and better manage emergencies. Some of the measures include actual mock drills, exposure to emergency simulations, and participations and attendance in skills trainings such as first aid training, life support training and emergency planning. These measures will provide nurses with simulation activities to improve their emergency competence and readiness (Ibrahim, 2014; Nilsson et al., 2016).

Significant challenges were lack of clear guidelines and standard operating procedures in the wards and specialized units on what should be done in case of an emergency.

5.3 Recommendations

- 1.The hospital should conduct regular training of nurses on emergency preparedness. Trainings such as BLS/ACLS are therefore recommended on regular basis such as every 3-6 months.
- 2.Continuous medical education sessions need to be reinforced in every unit in the hospital every week. Any updates on emergency preparedness will be shared during these sessions. During these sessions, demonstrations and return demonstrations will be done by the nurses. There is need for the hospital management to continuously ensure they avail necessary resources that can be used in emergencies in every unit so that all nurses are aware of their existence.
- 3.The hospital should also liaise with the County Government of Machakos to provide regular drills to all health workers working in the hospital.
- 4.The hospital administration to ensure standard operating procedures (SOPs) and checklists are availed in each ward and specialized unit.

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APPENDICES

Appendix I: Study Questionnaire

Questionnaire Serial Number_____Questionnaire Status_____ (1=Complete; Partially Complete)

Interview ID_____Date of Interview__/__/__

Your honest responses on the following questionnaire will greatly assist in the attempt to identify gaps on Emergency Preparedness. All responses will be coded by an identifying number only, kept confidential, and analysed in group form so that no personal information is revealed. Thank you for taking your time to complete the questionnaire.

PART A: Demographic factors

1. What is your gender?

Male Female

2. What is your age?

Below 20 21-30 31-40

41-50 51-60

1. Area of specialization ICU Renal Theatre NBU

Other (specify) _____

2. Which unit are you currently working in?

Accident an emergency Paediatric ICU

Medical Renal Obstetrics

Surgical Theatre Psychiatric

Other (specify) _____

3. How many years of work experience do you have?

Less than 1 year 1-5 years 6-10 years

11- 15 years 16-20 years 21-30years

More than 30

4. What is your academic qualification?

Certificate Diploma BScN

MScN

5. Are you a member of the emergency Response Team? YES NO

PART B: TYPES OF EMERGENCIES RECIEVED IN THE HOSPITAL

State the types of emergencies that you have received in the hospital.

Classification.	Response	
	YES	NO
8. Natural (earthquakes, volcanoes, drought, floods)		
9. Man-made (motor-vehicle/boat accidents, plane crash)		
10. Disease epidemics (cholera, Malaria, TB, measles, polio)		
11. Chemical spills		
12. Fires		
13. Food poisoning (Aflotoxin, drug overdose)		
14 Others		

PART C: LEVEL OF KNOWLEDGE ON EMERGENCY PREPAREDNESS

Click where applicable.

15. How do you rate your understanding on Emergency Preparedness?

Very good Good Average

16. Have you ever been trained on Emergency preparedness? YES NO

17. If yes, where? (Where applicable tick more than once)

College Seminar On job training

OH Emergency preparedness training

Other (Specify) _____

18. Have you ever received any training on BLS/ACLS? YES NO

19. Does the Emergency preparedness training acquired enable you to handle emergencies?

Competently? YES NO

20. Have you participated in drills related to emergency preparedness?

YES NO

21. Are you familiar with the procedures/roles to perform when called to assist during emergencies? YES NO

22. Are you familiar with emergency crash cart at working setting?

YES NO

23. Do you understand the emergency preparedness plan? YES NO

24. Have you read your Emergency plan?

Yes & i understand my role in it.

Yes & i do not understand my role in it.

NO

25. When did you last attend an emergency training?

In the last 12 months between 12 months & 2 years

I have not had any More than 2 years ago.

26. Are you familiar with the correct triaging of emergencies? YES NO

PART D: INSTITUTIONAL RELATED FACTORS INFLUENCING EMERGENCY PREPAREDNESS

Does the hospital administration recognize the following as the major components of Emergency preparedness as a framework of nursing care delivery?

Description	Response	
	YES	NO
27 Hospital recognizes emergency management plan as a framework for quality nursing care delivery.		
28 Hospital administration supports Emergency Response Team.		
29 Hospital management regularly reviews the contents of the emergency management plan.		
30 Hospital management supports trainings for all nurses on emergency management.		
31 Institution supplies relevant equipment/resources to enable nurses prepare for emergencies (vehicles for patient transport, blood banks, reagents etc.)		
32 Administration regularly performs emergency drills.		
33 Hospital administration avails personal protective equipment in case of an infectious disease outbreak (facemasks, caps, overall coats, boots, gloves, etc.)		
34 Hospital administration has ensured adequate evacuation plan and exit doors.		

PART E: Level of Emergency Preparedness

This was a direct observation without interacting with the people under study.

Emergency Preparedness Measures	Available
Hospital disaster plan	
Emergency Response Team	
Regular disaster preparedness drills	
Emergency response packs	
Triage team	
Triage flow charts in the departments	
Resuscitation team	
Updated inventory of resuscitation equipment, supplies and pharmaceuticals	
Personal protective equipment	
Adequate waiting and receiving areas for casualties	
Fire fighting equipment	
Fire exits	

Source: WHO, 1948. Hospital Emergency Response Checklist.
Authors Construct

Thank you for your responses.

Appendix II: Consent Form for Nurses

Nurses' Consent Form for Study Participation by nurses at ML5H

Introduction and Purpose

My name is Alice Ngina Muthiani. I am a Master of Science in Nursing (Critical Care) student. I am conducting a study on “Emergency Preparedness among nurses at Machakos level 5 Hospital in Machakos County, Kenya”. You have been asked to be a part of a research study that will take place in all departments that are operated by nurses. I want to determine the types of emergencies received within the hospital, to assess the knowledge of nurses on emergency preparedness, to determine nurses' attitude on emergency preparedness and to assess the institutional related factors influencing emergency preparedness among nurses at ML5H.

Procedures

We shall fill a questionnaire once you agree to participate and discuss your views concerning what you feel are the factors affecting emergency preparedness among nurses at Machakos Level 5 Hospital. Whether you agree to participate in the study or not will not affect your job in any way.

Risk/Discomforts:

No known risks involved in participating in this study. When completing the questionnaire, you may ask any question that you feel you do not understand.

Benefits

What we learn from this study will help us improve on the quality of emergency services that are given in this health facility and to establish support systems for addressing the challenges faced while providing these emergency services.

Confidentiality

We shall not write down your name or personal information. Findings from the questionnaires and data charts will be analysed together with others. The questionnaires will be secured in a locker at all the times. Only the principal investigator and the supervisors will be allowed to look at them. Your name or anything that might identify you will not appear in any write-ups.

Right to Refuse

It is your choice to participate in this study.

Contacts: If you have any question in relation to the study, you can contact the principal investigator:

Alice Ngina Muthiani, MSc in Nursing, Mount Kenya University, Tel- 0710898534,
Email-alicethiani@yahoo.com. OR

The Dean, School of Postgraduate Studies, Mount Kenya University Po. Box 342-01000, Thika.

If you agree to participate, please sign below.

Yes, I agree _____

Signature

Appendix III: Mount Kenya University Ethical Clearance



OCTOBER 11, 2018

Ref. No. MKU/ERC/1037

CERTIFICATE OF ETHICAL CLEARANCE

This is to certify that the proposal titled “EMERGENCY PREPAREDNESS AMONG NURSES AT MACHAKOS LEVEL FIVE HOSPITAL IN MACHAKOS COUNTY, KENYA” Whose Principal Investigator is Ms Alice Ngina Muthiani (MScN/2016/58375) has been reviewed by Mount Kenya University Ethics Review Committee (ERC), and found to adequately address all ethical concerns.

Dr. Francis W. Makokha
Secretary, Mount Kenya University ERC

Sign:  Date: 11.10.2018

Prof. Francis W. Muregi
Chairman, Mount Kenya University ERC

Sign:  Date: 11.10.2018

Appendix IV: School of Postgraduate Studies Introduction Letter



SCHOOL OF POSTGRADUATE STUDIES

MScN/2016/58375

16th October, 2018

*The Director, Research Coordination Division
National Commission for Science, Technology & Innovation
Utalii House, 8th & 9th Floor
P.O Box 30623- 00100
NAIROBI*

Dear Sir/Madam,

RE: ALICE NGINA MUTHIANI - REGISTRATION NO. MScN/2016/58375

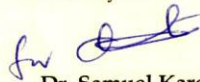
The purpose of this letter is to introduce the above named student who is pursuing **Master of Science in Nursing (Critical Care)** in the **Department of Nursing Education, Leadership Management & Research** in the **School of Nursing**.

The title of her research is *"Emergency Preparedness among Nurses at Machakos Level Five Hospital in Machakos County, Kenya."*

She has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data for her research between **October and December, 2018**.

Any assistance accorded to her will be highly appreciated.

Thank you.



Dr. Samuel Karenga, Ph.D
Dean, School of Postgraduate Studies
Enc.

Mount Kenya University
School of Postgraduate Studies
P.O. Box 342-01000 Thika

Appendix V: NACOSTI Research Authorization



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/18/77236/26397**

Date: **18th December, 2018**

Alice Ngina Muthiani
Mount Kenya University
P.O. Box 342-01000
THIKA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Emergency preparedness among Nurses at Machakos level five hospital in Machakos County Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **Machakos County** for the period ending **18th December, 2019.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Services, Machakos County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a **copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:


The County Commissioner
Machakos County.

The County Director of Education
Machakos County.

Appendix VI: NACOSTI Research Clearance Permit

THIS IS TO CERTIFY THAT
MISS. ALICE NGINA MUTHIANI
of MOUNT KENYA UNIVERSITY, 0-90100
MACHAKOS, has been permitted to
conduct research in Machakos County
on the topic: EMERGENCY
PREPAREDNESS AMONG NURSES AT
MACHAKOS LEVEL FIVE HOSPITAL IN
MACHAKOS COUNTY KENYA
for the period ending:
18th December, 2019

Permit No : NACOSTI/IP/18/77236/26397
Date Of Issue : 18th December, 2018
Fee Received :Ksh 1000



Applicant's Signature

Director General
National Commission for Science, Technology & Innovation

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licenses) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the license of research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and Innovation
P.O. Box 36621 - 00100, Nairobi, Kenya
Tel: 020-400 3000, 0713 786787, 0735-484248
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 22460

CONDITIONS: see back page

Appendix VII: Machakos Level 5 Hospital Research Authorization

REPUBLIC OF KENYA



GOVERNMENT OF MACHAKOS COUNTY
DEPARTMENT OF HEALTH & EMERGENCY SERVICES

Telephone: +254-44-20575
Fax: 254-44-20655
When replying please quote

Machakos Highway
P.O. Box 2574-90100
Machakos

Ref: MOH/MKS/RSRCH/VOL.1/25

19th November, 2018

Alice Ngina Muthiani
P.O. Box 167 – 90100
MACHAKOS

RE: RESEARCH AUTHORIZATION

Reference is made to the following:-

- 1) Aailed letter from Mount Kenya University vide letter no.MScN/2016/58375 dated 16th October, 2018, and a certificate of clearance no. MKU/ERC/1037 dated 11th October, 2018.

You are hereby authorized to undertake research on "*Emergency Preparedness among Nurses at Machakos Level Five Hospital in Machakos County, Kenya*" for the period between October and December, 2018.

By a copy of this letter, the Medical Officer of Health Machakos Level 5 Hospital is requested to offer the necessary support.

You are required to furnish this office with a copy of your study findings at the end your study period.


Dr. Ruth Mutinda
Director for Health Services
MACHAKOS

Copy to:

Chief Officer, **Health and Emergency Services**

Appendix VIII: Similarity Index Report

**EMERGENCY PREPAREDNESS
AMONG NURSES AT
MACHAKOS LEVEL FIVE
HOSPITAL IN MACHAKOS
COUNTY, KENYA**

by Alice Ngina Muthiani

Submission date: 28-May-2021 12:41PM (UTC+0300)

Submission ID: 1595927833

File name: FINAL_THESEES_26052021.docx (6.11M)

Word count: 20480

Character count: 117781

*Similarity Index with
reference

28/5/21 -*

EMERGENCY PREPAREDNESS AMONG NURSES AT MACHAKOS LEVEL FIVE HOSPITAL IN MACHAKOS COUNTY, KENYA

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