

**ASSESSMENT OF THE KNOWLEDGE AND SKILLS IN CARING FOR
LIFE THREATENING ARRHYTHMIAS AMONG NURSES WORKING
IN CRITICAL CARE SETTINGS AT MUHIMBILI NATIONAL
HOSPITAL, DAR-ES SALAAM, TANZANIA**

Dinnah Issa Ruhwanya

**MSc. (Nursing Critical Care & Trauma) Dissertation
Muhimbili University of Health and Allied Sciences
October, 2016**

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By

Dinnah Issa Ruhwanya

**A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree
of Master of Science in Nursing (Critical Care and Trauma) of
Muhimbili University of Health and Allied Sciences**

**Muhimbili University of Health and Allied Sciences
October, 2016**

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled “*Assessment of the knowledge and skills in caring for life threatening arrhythmias among nurses working in critical care settings at Muhimbili National Hospital, Dar es Salaam, Tanzania*” in (Partial) fulfillment of the requirements for the degree of Master of (Nursing Critical care and Trauma) of Muhimbili University of Health and Allied Sciences.

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I, **Dinnah Issa Ruhwanya**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature..... Date

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I love you all.

Dinnah R.

DEDICATION

This work is dedicated to all nurses working in the critical care settings at Muhimbili National Hospital and other health care workers at Muhimbili National hospital.

ABSTRACT

Background: Life threatening arrhythmias are those arrhythmias that if not intervened on immediately can cost a patient's life. This study identified ventricular tachycardia, ventricular fibrillation, pulseless electrical activity, complete heart block, and asystole as types of life threatening arrhythmias. The AACN Synergy Model was used in this study which provided an important framework for nursing practice. It determines nurses' competencies through a theoretical ability to detect, manage, and monitor, in conjunction with usage of a resource system available in detecting and correcting specific types of life threatening arrhythmias. Research related to nurses' knowledge and skilled assessment in caring for life threatening arrhythmias in the critical care setting remains limited. There has been no study in Tanzania about nurses' knowledge and skills related to caring for life threatening arrhythmias.

Objective: To assess knowledge and skills in caring for life threatening arrhythmias among nurses working in critical care settings at Muhimbili National hospital.

Material and Methods: A descriptive cross-sectional study design was employed. Data were collected using a semi-structured questionnaire and observation skills from a convenient sample of 141 nurses working in critical care settings at Muhimbili National Hospital (Main ICU, EMD, CCU, Cardiothoracic ICU and HDU (Ward 1). The study was approved by institutional review board of Muhimbili University of Health and Allied Sciences. Permission to conduct the study was obtained from MNH authority prior to data collection. Data were analyzed by using SPSS version 20.0 Results were summarized using frequencies and percentages, and presented using figures, tables and text.

Results: Majority of the participants (60%) were identified as having high knowledge. Participants had high knowledge in interpreting EKG strips on asystole, where by 82.3% scored correctly and also demonstrated more knowledge by 95% in its nursing care. On the other hand, observational skills in caring for life threatening arrhythmias among study participants were generally poor. Skill deficit was observed in skin preparation before application of electrode by 94.3% and also in ability to interpret abnormality found in

standardized EKG by 88.7%. Significant association was found between level of education and skills and knowledge in caring for life threatening arrhythmias. Barriers identified in acquiring high knowledge and skills regarding caring for life threatening arrhythmias included: stress caused by overwhelming workload (68.8%), followed by inadequate cardiac monitors or machines that detect life threatening arrhythmias compared to patients' number 60.3 % and lack of mandatory training on caring for life threatening arrhythmias (51.1%).

Conclusions: The current study revealed that nurses working in the critical care settings have high knowledge on caring for life threatening arrhythmias. However low skills observation identified, might be due to poor emphasis on practicing procedures. Availability of resources monitors, defibrillators and 12-lead EKG and guidelines were found to be adequate, although generally the usage was observed to be minimal. The identified barriers in acquiring high knowledge and skill in caring for life threatening arrhythmias were: stress caused by overwhelmed workload and lack of mandatory training on caring for life threatening arrhythmias, affected the implementation of optimal care.

Recommendations: Efforts should be made to encourage nurses to engage in translation of their knowledge into practical skills. This can be done by designing and implementing a continuous professional practical skills program on life threatening arrhythmias for nurses caring in critical care settings at MNH. The special focus should be based on the methods of teaching, use of guidelines/ algorithms, protocols and charts for proper practice. The ministry of health should find a way to modify infrastructures within the regional hospitals so that every hospital should have highly equipped and trained nurses in critical care settings thus minimize referral cases to MNH. A similar study using mixed methods is recommended and also involving more than one hospital in order to gain more insight on the knowledge and skills of nurses in caring for life threatening in critical care settings.

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LIST OF ABBREVIATIONS

AACN.....	American Association of Critical Care Nurses
ACLS.....	Advanced Cardiac Life Support
AHA.....	American Heart Association
BLS.....	Basic Life Support
BP.....	Blood pressure
CCU.....	Coronary Care Unit
CPR.....	Cardiopulmonary resuscitation
CO.....	Cardiac output
COPD.....	Chronic obstructive pulmonary diseases
CICU.....	Cardiothoracic Intensive Care Unit
EKG / ECG.....	Electrocardiogram
EAD.....	External automated defibrillator
EMD.....	Emergency Medicine Department
HDU.....	Highly Dependency Unit
ICU.....	Intensive Care Unit
MNH.....	Muhimbili National Hospital
MUHAS.....	Muhimbili University of Health and Allied Science
PEA.....	Pulseless Electrical Activity
SA.....	Sinal trial node
VT.....	Ventricular Tachycardia
VF.....	Ventricular Fibrillation
WHO.....	World Health Organization

OPERATIONAL DEFINITIONS

Assessment:

In this study assessment means the process of determining the level of knowledge and skills of nurses working in clinical care settings at MNH in caring for patients with life threatening arrhythmias.

Caring:

In this study caring means knowledge and expertise through continuous close observation, recording, detection and taking measures to patient in correcting specific life threatening arrhythmias through EKG strips displayed or recorded by cardiac monitor or EKG 12 lead.

Life threatening Arrhythmias:

In this study life threatening arrhythmias means those abnormal or irregular heartbeats which may cause sudden death. According to this study the following are identified as life threatening arrhythmias: ventricular tachycardia, ventricular fibrillation, pulseless electrical activities, complete heart block and asystole.

Knowledge:

In this study knowledge means theoretical understanding of nurses on different types of life threatening arrhythmias based on EKG strip and describing proper management needed to correct them. The study will consider a score of 50% and above as high knowledge.

Skill:

According to this study skill means a nurse demonstrating ability on caring for different types of life threatening arrhythmias through application of different procedures to correct them. The study will consider study a score of 50% and above as high skill.

CHAPTER ONE

INTRODUCTION

1.1 Background

Arrhythmias are abnormal heart rhythms due to disturbances in heart automaticity and/or abnormal heart conduction thus causing a reduction in cardiac output, a change in heart rate and ultimately tissue perfusion (Tracy, 2011). Any impulse originating outside the sinoatrial node can cause abnormal heart rhythms. Electrolyte disturbances, ischemia, excessive myocardial fiber stretch, drugs, or toxins may cause arrhythmias. Disturbed automaticity of pacemaker cells causes SA node stress and thus may lead to premature beats, atrial tachycardia, accelerated idioventricular rhythm, and ventricular tachycardia. Disorders in impulse conduction involve heart blocks, which result in slowed or blocked conduction of electrical impulses. The pathological process of reentry is also an impulse conduction abnormality through the myocardium (Sprague, 2001).

Currently, an electrocardiogram (EKG) is normally used as the first tool for initial screening of cardiovascular disorders and noninvasive diagnosis of life threatening arrhythmias in clinical practice (Sayadi, 2011). EKG monitoring in hospitals has evolved from simple rhythm diagnostics to the diagnosis of complex arrhythmias (Pettersen, et al., 2014). Without the benefit of an EKG it may be impossible to tell whether symptoms like chest pain, syncope fainting, loss of consciousness, dyspnea and diaphoresis breathlessness, and sweating are due to life threatening arrhythmias or other conditions (Hassan & Hassan, 2014).

Life threatening arrhythmias are those arrhythmias that require immediate intervention. Arrhythmias in the presence of cardiovascular disease are more dangerous and at times may be life threatening, unlike those occurring in otherwise healthy patients, which are usually of little clinical consequence (Dua & Kumra, 2010). Arrhythmias are many and vary in severity. Much of the literatures consider ventricular tachycardia, ventricular fibrillation, pulseless electrical activity, complete heart block, and asystole to be the most common types of life threatening

arrhythmias (Mohan, 2010, Leijdekkers & Gay 2006). This study will concentrate on those types of arrhythmias.

According to WHO report of the year 2014, 16 million people died from non-communicable diseases and 37% of those deaths occurred due to a cardiovascular disease (WHO, 2014). In Sub-Saharan African countries, the number-one cause of mortality in those over the age of 35 is undiagnosed and untreated hypertension. Progressive urbanization and westernization of lifestyle are among some of the risk factors for cardiovascular diseases (Tontchou et al., 2011). However, shortage of data on the burden of cardiovascular diseases in Sub-Saharan Africa countries is still unknown due to lack of research and records which is caused by limited local expertise and poor funding (Mocumbi, 2012).

In Tanzania, in 2012, 18 to 24% of deaths were due to non-communicable diseases and 9% of those were due to a cardiovascular condition, predisposing factors being obesity, tobacco use, alcohol consumption, and hypertension (Mayige et al., 2012). At Muhimbili National Hospital in Dar es Salaam, between 350 and 500 patients with heart disease are seen weekly (Mvungi, 2013). It is estimated that in the next three years the hospital will be able to reduce the number of patients transferred abroad by 60% due to the presence of open cardiac surgeries and advanced procedures like percutaneous coronary intervention (Mvungi, 2013). However, there is limited data regarding the leading cardiac diagnoses responsible for admission to MNH due to an inappropriate medical recording system.

It is vital to remember that arrhythmia algorithms are more than simple mnemonics and that they provide a hierarchical approach to patient survival. The American Association of Critical Care Nurses developed a model for acute and critically ill patients, which will be applied in this study (Curley, 1998). The model is known as the Synergy Model. The AACN Synergy Model provides an invaluable framework for nursing practice which is determined by nurses' competencies through use of resources (Kaplow & Reed, 2008).

1.2 Problem statement

Life threatening arrhythmias are a major concern in developing countries, including Tanzania, as it is mainly associated with cardiovascular disorders which have risen in recent years. The exact magnitude and outcome of life threatening arrhythmias is not documented in the country due to poor resource utilization and lack of screening for detection. Electrocardiograms are the commonly used method for examination and diagnostics in emergency services and in critical care settings that provide nurses with information about the patient's electro-cardiac record in a manner that is easy and fast to use. According to the researcher's observation, patients who are critically ill admitted to MNH critical care settings are monitored using cardiac monitors and twelve lead EKG is routinely done daily for those with cardiac problems, for arrhythmia evaluation due to the risk of developing life threatening arrhythmias.

According to the American Heart Association guideline of 2015, the most serious complication of a life threatening arrhythmia is sudden cardiac arrest and eventually death if not intervened on immediately. Nurses who care for critically ill patients need to have a thorough understanding of the hint provided by EKG, which includes heart rate, regularity of the rhythm, interval measurements and characteristics of each individual waveform of the heart. There is no clear understanding on the nurse's knowledge and skills level on the areas of life threatening arrhythmias caring and arrhythmia identification at MNH. Meanwhile the intensity of barriers met by nurses on achieving high level of knowledge and skills in developing countries including Tanzania are significantly not well analyzed. These problems are based on the literature and situation occurring in critical care settings at MNH.

Therefore, due to the above stated reasons, the researcher has drawn attention to the importance of identifying the current nurse's level of knowledge and skills in caring for life threatening arrhythmias. The researcher also draws attention to barriers in acquiring high level of knowledge and skills met by nurses in critical care settings at MNH in and also to the ways in which practice can be improved.

1.3 Justification

The purpose of this study was to assess the level of knowledge and skills in caring for life threatening arrhythmias among nurses' working in critical care settings at MNH. Once the level of knowledge and skills are known, appropriate recommendations can be made regarding measures to be taken to improve nurse's knowledge and skills in caring for life threatening arrhythmias in the critical care settings at MNH. Through application of the recommendations nurses will acquire high levels of knowledge and skills in caring for life threatening arrhythmias in their daily practice and improve patients' outcomes. The results will be presented to MNH authorities, especially the Directorate of nursing services, in order to provide reference for further actions to be taken. These results will also help stakeholders who wish to assist nurses in increasing their knowledge and skills in caring for life threatening arrhythmias.

1.4 Research questions

1. What is the level of knowledge of nurses working in critical care settings at MNH regarding caring for life threatening arrhythmias?
2. What are the skills of nurses working in critical care settings at MNH regarding caring for life threatening arrhythmias?
3. What are the barriers in critical care settings at MNH that prevent nurses from having adequate knowledge and skills in caring for life threatening arrhythmias?

1.5 Objectives

1.5.1 Broad objective

The main objective of this study was to assess knowledge and skills in caring for life threatening arrhythmias among nurses working in critical care settings at Muhimbili National hospital.

1.5.2 Specific objectives

1. To determine the level of knowledge among nurses regarding caring for life threatening arrhythmias in critical care settings at MNH.
2. To recognize skills of nurses regarding caring for life threatening arrhythmias in critical care settings at MNH.
3. To identify barriers to acquiring high knowledge and skills in caring for life threatening arrhythmias among nurses in critical care settings at MNH.

1.6 Conceptual framework

The synergy model for patient care of the American Association of Critical Care Nurses. The AACN Synergy Model is a conceptual framework for designing practice and for developing the competencies that are required of personnel working for units that specialize in the care of critically ill patients (Hardin & Kaplow, 2005). The components of the model are: patient characteristics, nurse competencies and the healthcare system. In this study two components have been used which are: nurses' competencies and health care resource system. This framework was appropriate for the study which provided guidance during the literature review, development of study tool and discussion of the results.

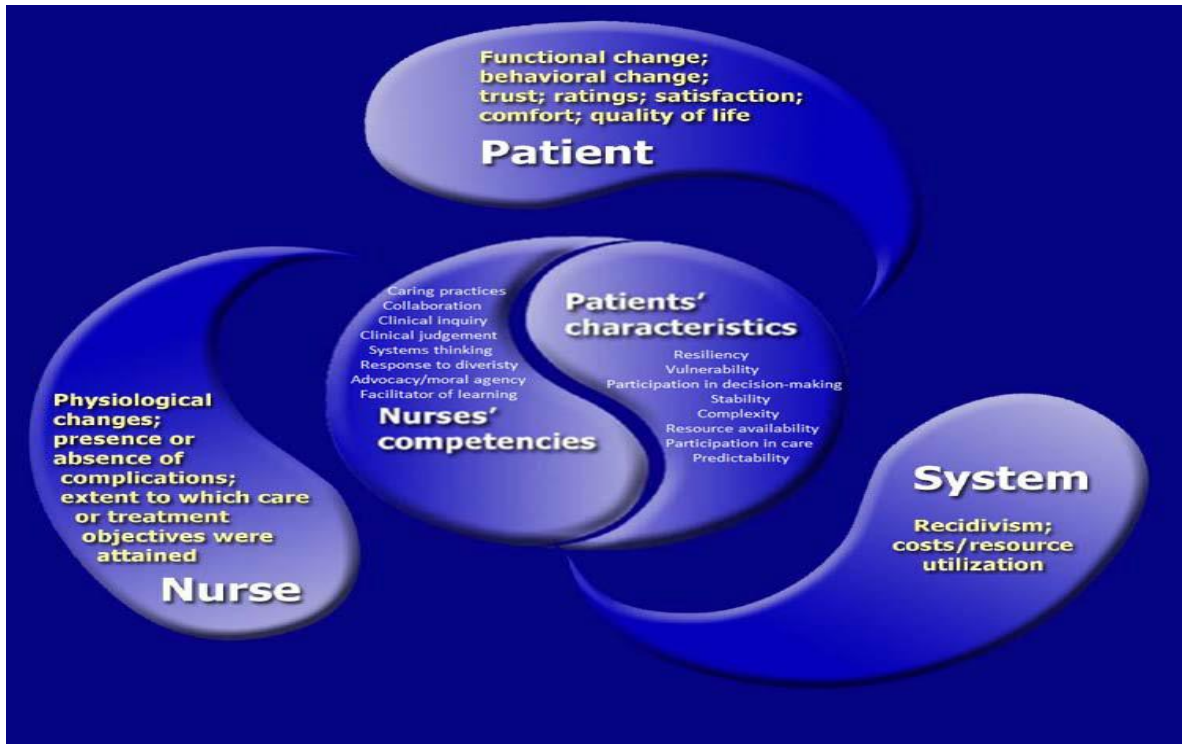


Figure 1: AACN Synergy model (source: Curley, 1998)

The modified Synergy Model

The model describes the relationship between nurses' competencies and resource systems in evaluating knowledge and skills of nurses in caring for life threatening arrhythmias. It recognizes the importance of nursing care based on the use of resources and matches with nurses' competencies to optimize skills and knowledge outcomes (Curley, 1998).

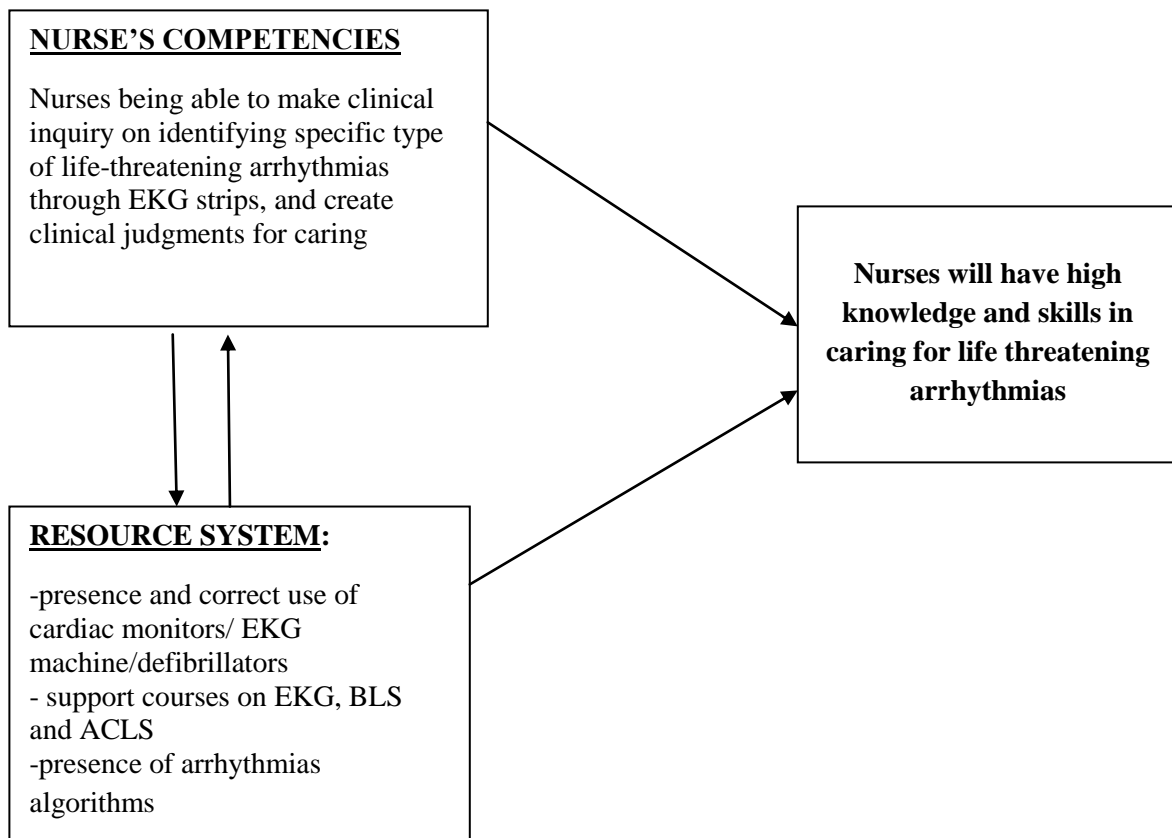


Figure 2: Modified conceptual framework of synergy model

Nurse competencies

The nurse needs to detect specific types of life threatening arrhythmias based on knowledge and skills gained through clinical inquiry. In response to physiological change of heart rhythm, the nurse needs to recognize any type of life threatening arrhythmias through EKG strips provided. At the end the nurse is going to apply the specific measures to correct any type of life threatening arrhythmias based on clinical decision through application of proper care needed to that particular patient. The nurse makes a decision by integrating with his/her past educational knowledge or experience in caring for critically ill patients with algorithms that direct practice within the units. With life-threatening arrhythmias, time is very crucial in order to save the patient's life. In this study nurses were assessed on their knowledge and skills in interpreting EKGs and the provision of proper management in particular life-threatening arrhythmias.

Resource system

The health care system is responsible for ensuring availability of training, supplies and equipment to assist staff development, based on life threatening arrhythmias care, in order to maintain the highest standard of quality care. This study assessed the availability of algorithms, functional equipment, and how nurses are able to use such equipment like EKG machines, monitors, and defibrillators to detect and correct life-threatening arrhythmias. The proper use of equipment needs to be demonstrated by the nurse in conjunction with knowledge and skills gained from training or clinical experiences.

CHAPTER TWO

LITERATURE REVIEW

2.1 General overview of nurses' knowledge and skills in caring for life-threatening arrhythmias

In critical care settings, bedside nurses play a critical role in arrhythmia identification and management. The current practice is that nurses gather data, and notify the physician, who makes treatment decisions based on the rhythm interpretation of the nurse, or institutes pharmacologic and counter shock therapies consistent with unit-specific protocols or algorithms (Keller & Raines, 2005). A study done in Florida in the United States, assessed knowledge of nurses in categorizing cardiac arrhythmias as the first step toward developing an instrument to measure their competence (Keller & Raines, 2005). The study identified the deficits of nurse's knowledge on identifying specific types of life-threatening arrhythmias like complete heart block, aberrant conduction and tachyarrhythmia's. The researchers concluded that measuring knowledge levels of critical care nurses regarding arrhythmias is necessary for developing strategies to increase the knowledge of nursing professionals.

Another study done at Duke University Hospital in USA used a laboratory-based experiment to determine if patients identified to have pulseless ventricular tachycardia or ventricular fibrillation were receiving proper management on time (Segall et al., 2015). The experiment needed participants who had over one year of experience in cardiac patient monitoring and 99% of the forty two participants did have the required experience. During the experiment nurses needed to perform rhythm strip interpretation, documentation, and call for help as necessary evaluation criteria. The results showed that nurses took longer than expected in identifying the exact type of arrhythmias which consequently delayed countershock delivery. Out of nine participants, three required twenty seconds or longer to recognize the specific type of arrhythmia, whereas the response time was supposed to be less than twenty seconds in order to prepare for delivery of shock within two minutes. It is recommended that hospitalized patients with VT/VF should receive defibrillation within two minutes of recognizing cardiac

arrest (Ewy & Ornato, 2000). The time from discovery of unresponsiveness until shock is delivered influences survival in in-hospital cardiac arrest; hence nurses are needed to be very experienced since they are with patients all the time (Herlitz,et al., 2005). Gupta & Dias (2014) recommended a simulation-based environment should be provided to nurses in order to gain much experience in defibrillation and other resuscitative procedures. Such practice may offer opportunities for nurses to practice the complex interplay of verbal and non-verbal communication modes that would otherwise not be possible in the actual situation. On the other hand, no study has been published regarding assessment of knowledge and skills of nurses regarding life threatening arrhythmias neither in Tanzania nor Africa.

2.2 Barriers to adequate knowledge and skills in management of life threatening arrhythmias

The practice standard in EKG monitoring created by the AHA recommends to nursing leadership that required nursing competences should be determined for particular units that are specific to the types of patients cared for (Drew et al.,2004) . This scientific statement recognized the cause of nursing shortages was due to experienced nurses transferring to other units or positions thus causing nurses with little or no experience to be working in critical care settings (Drew et al., 2004). Allocation working places for nurses should be based on the individual nurses working experience, expertise and personal preferences. This will increase individual working morale and increasing knowledge and skills thus will improve patient's outcome.

A study done in Botswana identified a shortage of cardiac monitors compared to the number of patients requiring them, with the majority of monitors being out of function for several days, sometimes even months, without being fixed (Rajeshwaran & Literature, 2009). The study also explored that only the critically ill patients with an abnormal BP were cardiac monitored, making identification of life threatening arrhythmias difficult.

On the other hand, adequate organizational support lowers the probability of poor patient outcomes. Unhealthy and substandard work environments contribute to medical errors,

ineffective delivery of care, and an increase in the degree of conflict and stress experienced by nurses working in critical care settings (AACN, 2005). According to the American Association of Critical Care Nurses (2005), the following factors are considered as competency in caring practice: presence of physiological imbalance, prioritizing available information detected by resources to perform fast and reliable tests and safe interventions in accordance with changes in patient's condition, continuous monitoring of the patient, and providing the patient with specific services.

2.3 Application of resource system in increasing knowledge and skills in caring life threatening arrhythmias

Efforts are needed to increase knowledge of EKG interpretation since it has been observed that nurses knowledge and skills in EKG interpretation diminish with time (Lak et al, .2013). Although there is no one specific method for teaching arrhythmias to critical care nurses, several approaches have been used to assist nurses in increasing their knowledge and skills. One study used simulator software to improve electrocardiogram interpretation skills among nurses working at Syedoshohada hospital in Iran. The results showed an increase of post-test scores by 15 points compared to pre-test scores (Herlitz et al., 2005). The study emphasized that nurses working in critical care units need to be empowered to take EKG interpretation courses, utilizing any teaching method thought to increase knowledge retention. In addition, the study identified the necessity of nurses having permanent access to EKG machines and cardiac monitors in order to maintain their competencies (Lak et al., 2013).

Schultz (2010) used an interventional study of one group before-and-after as a cohort study designs. The study combined interactive web-based collaborative learning activities and validation of staff's competency using a skills checklist. Monitoring criteria was made based on placement of electrodes, lead selection, QTc interval monitoring, QRS morphology analysis, and nursing interventions for wide-QRS complex. The study suggested that hospital administrators should encourage nurses to participate in the clinical practice developmental program to increase their knowledge and skills in arrhythmia monitoring practice. It has since been discovered that a majority of nurses withdrew from the study without having a major

reason, hence incentives should be utilized, such as increasing salary in order to create more interest—in the topic (Schultz, 2010). In another study done in India by Mohan (2010) concerning life threatening arrhythmias knowledge and management, they identified higher knowledge among those who attended CPR training (51.1%) compared to those who did not attend a CPR course (48.9%). On the other hand, the study showed no statistically significant difference between the mean knowledge score and age, experience, or even the place of work (Mohan, 2010). Organizational supports are very crucial for nurses to practice efficiently within critical care settings.

2.4 Different practical skills that interfere with EKG measurement

An AHA guideline (2015:26) article stated that, “EKG quality can be affected by many factors, thus interfering with correct EKG interpretation. Wrong lead selection in cardiac monitoring may mask the presence of any life-threatening arrhythmias and may thus lead to improper diagnosis.” Keller & Raines (2005) identified incorrect application of electrodes as being a weakness of some nurses working in critical care with patients on cardiac monitors. Incorrect electrode placement can decrease the quality of the electrical signal and lead to incorrect EKG readings. Improper skin preparation like forgetting to shave or clean before application of electrodes may interfere with electricity transmission and give false readings (Schultz, 2010). Presence of abrasions also minimizes inertial and relative motion problems in the stratum granulosum, while oily skin and other debris can impede electrical flow (Millar et al., 2005). Reuse of electrodes on many patients, or use of leads for more than one day may reduce the quality of electrode measurement. Shephard et al, (1994) identified the following eight desirable characteristics for any monitoring technique: accuracy, reproducibility, timely rapid response, operator independence, ease of application, no or reduced morbidity, continuous use of technique and cost effectiveness.

2.5 Importance of nursing competence in caring for life-threatening arrhythmias

The American Nurses Association (2000:64) defines continuing nursing competency as “systematic professional experiences designed to augment knowledge, skills and attitudes of

nurses, and therefore enrich the nurses' contributions to quality of health care and their position of professional goals". Since health care institutions have an obligation to provide effective health care to patients through use of nursing care plan components, the resource system has to ensure that their personnel have capabilities to care for patients according to patient needs and that they are appropriate to each individual's job description (Resuscitation Council of UK, 2005). Through use of knowledge they get during trainings, resource use that helps in arrhythmia identification, adherence to guidelines and techniques that are implemented during provision of care, thus carry the weight of nurse's competence.

CHAPTER THREE

STUDY DESIGNS AND METHODS

3.1 Introduction

The research methodology chapter contains information on how the study was conducted and analyzed (Polit & Beck, 2006). The issues included in this section are study design, the setting of the study, study population, sample size and sampling method, data instruments and data collection, data analysis, and ethical consideration.

3.2 Research design

A descriptive cross-sectional design, which utilized a quantitative method, was used for the study. The variable measures were knowledge, skills and barriers. As a descriptive cross-sectional study, data was collected only at one point in time in order to describe an event that occurred in a given environment (Polit & Beck, 2006).

3.3 The Study Settings

This study was conducted at MNH in critical care settings that included the Emergency Medicine Department (EMD), Coronary Care Unit (CCU), Main Intensive Care Unit (ICU), Highly Dependent Unit(Ward -1 HDU), and Cardiothoracic Intensive Care Unit(CICU). MNH is the only national referral hospital and university teaching hospital situated in Upanga, Ilala District in Dar es Salaam. The critical care settings at MNH have 170 nurses.

3.3.1 The Emergency Medicine Department (EMD)

The EMD is the receiving department for all emergency referral cases from different hospitals within the country. The EMD provides caring services for acutely ill patients with potentially life-threatening conditions. The aim is to stabilize critically ill patients and manage them in time before referring them to the appropriate inpatient wards, intensive care units, or for other medical evaluation for further diagnosis and treatment. The EMD has a triage area and four resuscitation rooms where critically ill patients with the potential for deterioration are managed. Six treatment rooms are available for patients who do not need emergency care.

There is a mass casualty area where patients can be triaged and managed in the case of a mass casualty incident. The Emergency operating theatre contains two operating rooms for patients coming from the EMD who need emergency operations. The emergency operating theatre has 88 nurses.

3.3.2 Main intensive care unit (ICU)

The main ICU is the place where critically ill patients are cared for. Patients from various hospital units can be transferred to the main ICU. The ICU has five beds, one incubator for neonates, and receives critically ill patients from the emergency department, the wards, and the operating theatre. The department has 27 working nurses.

3.3.3 Coronary care unit (CCU)

The coronary care unit has 6 beds (3 for men and 3 for women), each with a cardiac monitor and equipped with intelligent ventilator machines (able to change modes automatically according to patient's needs). Automatic operating beds also have equipment for tertiary cardiovascular care management and treatment. The common conditions cared for in the CCU are: acute coronary heart diseases, pulmonary embolism, arrhythmias, severe hypertension, cardiogenic shock, decompensated cardiomyopathy, and patients who are post-pacemaker and cardiac catheterization. The CCU unit has eleven nurses.

3.3.4 Cardiothoracic ICU

The cardiothoracic intensive care unit has eight beds with cardiac monitors and modern monitoring machines. The unit is close to the cardiac operating theatre where every patient who has undergone a major cardiothoracic procedure has to be cared for, until hemodynamically stable before being transferred. The unit has 17 nurses.

3.3.5 Highly dependent unit

The hospital has a highly-dependent unit known as ward one, which has 27 nurses. The aim of this unit is to care for critically ill patients who do not need mechanical ventilation but need

close and continuous cardiac monitoring.

3.4 Study Population

Polit and Beck (2006) define a study population as “the entire set of individuals that possess some common characteristics”. The study population was 170 nurses working in critical care settings. These settings include the EMD, main ICU, CCU, CICU and HDU (ward1).

3.5 Sample Size calculations

The target population is finite (known) and the following formula was used to determine the sample size (Krejcie & Morgan 1970).

$$S = \frac{X^2NP(1-P)}{d^2(N-1) + X^2P(1-P)}$$

Where:

S = Sample size

X = Z value (e.g. 1.96 for 95% confidence level)

N = Population Size

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%) – this provides the maximum sample size).

d = margin of error (5%), expressed as a proportion (.05)

To simplify the process of determining the sample size for a finite population, Krejcie & Morgan(1970), came up with a table of reference. Thus, the table provided was used as a reference.

According to the table provided by Krejcie& Morgan (1970) in a population of 170 = 118 people, the sample size is 118 people.

Allowing for 10% non-response, the minimum sample size was adjusted

$$n = n \times (100\% / (100\% - f\%)) = 118 \times 100 / 90 = 130$$

The sample of 130 nurses was supposed to be included in this study. The researcher increased representativeness by including any nurse working in critical care settings during data collection.

3.6 Sampling Technique

Convenience sampling method was used. This is one of the non-probability types of sampling techniques where only those people who are readily available and agree to participate are included in the study (Latham, 2007). After getting permission from the MNH management, the researcher went to the critical care settings and spoke with the nurses. The researcher provided potential participants with an explanation of and rationale for the study. The nurses who were willing to participate in the study were given full information about the study and then provided with a consent form.

3.7 Inclusion criteria

Nurses (registered and enrolled nurses) working in critical care settings who were available during the data collection period and voluntarily signed a consent form to participate in this study.

3.8 Exclusion criteria

Nurses (registered and enrolled nurses) working in critical care settings who were not available during the time of research, who were sick, or those who refused to participate.

3.9 Data collection

The data collection process took about three weeks which was from 1st to 21st April, 2016. After completion of the questionnaire, each participant was tested on skills based on conduction and EKG interpretation and provides appropriate care to specific life threatening arrhythmias. The data collection instruments were a self administered questionnaire on knowledge and an observational checklist on skill. The researcher and research assistants gave

the questionnaires to the participants to fill in and hand back. The researcher or research assistants went through all questionnaires to see if they were filled properly. Only the researcher did the observational check list for all participants.

3.9.1 Data collection tools

The questionnaire was composed of 21 questions in four sections. Section A included questions on demographic data, section B was based on availability of the resources and systems. Section C consisted of knowledge on life threatening arrhythmias according to the type of EKG strips displayed and the proper management applicable, and section D focused on the barriers which were hindering nurses from acquiring a higher level of knowledge and skills in caring for life-threatening arrhythmias. All questions had multiple choice–answers and participants completed the questionnaire by choosing the appropriate answer and all applicable answers. The questionnaire was in English since it is the official language of Tanzania as far as nurses were involved (See appendix I).

The observation checklist consisted of 13 questions based on skills assessment. The researcher constructed an observational check list and adapted scoring criteria used by Schultz (2010) when conducted a study on arrhythmia monitoring practice among nurses on a telemetry unit, in North Florida. The scoring criterion was categorized in three criteria: competent, needs improvement and not competent. Skills of each individual participant were assessed in isolation when the researcher asked each of the respondents to perform various life threatening arrhythmia treatment skills. The total score was 26 points and then scoring points were converted to a percentage in order to represent the individual achievement score of 0 to 100 (high score considered from 50% to100%).

Questions were based on connection of the patient to the cardiac monitor or EKG machine, proper lead placement and interpretation of P and QRS complex (both on the cardiac monitor and 12 lead EKG), skills on CPR and the procedure of defibrillation thus including indication, connection, and pad placement and delivering shocks. (See appendix II). Some tools used to assist in skills evaluation apart from the checklist were standardized EKG (see appendix IX) and non electronic manikin.

3.9.2 Data collection procedure

After getting a sample of participants who were willing to participate in the study, full information about the study was communicated, then an informed consent form was given for them to sign. The questionnaire was given to the nurse. It was expected to take about 10 to 15 minutes for a participant to respond to all questions. In the observational checklist, the researcher arranged a simulation environment for each participant to perform procedure and the researcher graded the point according to the ranking scale.

3.9.2.1 Quality assurance of data

The data were regularly checked, upon returning the questionnaires to the researcher or research assistants, to see if they were completed and filled properly. Data from completed instruments were evaluated using scoring criteria formulated by researchers and then validated by a nurse specialist in critical care and 1 cardiologist, ready for the analysis of the data. Moreover validity and reliability of the data was performed as explained below.

3.9.3 Reliability and validity

3.9.3.1 Validity

To ensure the validity of the tools the researcher used the content validity technique. This is a type of technique which requires a researcher to include all the necessary information that the tool is required to measure, in order to answer the research questions.

The tools formulated by the researcher were handed to five experts in critical care; research supervisor and co-supervisor, 2 critical care nurse specialists (1 from EMD and 1 from cardiac), and one cardiologist. Nurse experts who were involved in validation were excluded from the study. Relevance of all items were assessed by scoring the items on a scale of 1 to 3: 1 = not relevant; 2 = relevant, but not necessary; 3 = absolutely necessary.

3.9.3.2 Reliability

According to Burns & Grove (2005), the reliability of a measure denotes the consistency of the measures that are obtained when using a particular instrument and it is an indication of the extent of a random error in the measurement method. Reliability was maintained by ensuring

consistent and accurate recording of the data. Observation of skills was done only by the researcher so as to ensure consistency in scoring the observed practice and to avoid an observer bias. To ensure reliability of the research tools, the researcher calculated Cronbach's Alpha for internal consistencies during data analysis by using SPSS Version 20, which showed good results (self administered questionnaire questions $r = 0.78$ and for observational skills questions $r = 0.8$).

3.9.4 Pre-testing

The **pre-testing** was conducted with 13 nurses working in a critical care setting. This number was equal to 10% of the calculated sample size. The aim of pre-testing the research instrument was to check whether was able to collect desired information that is relevant to the particular study. Responses from the study participants were compared to assess if questions were well-understood. Changes were made in some of the items before implementation of the research tools in order to answer research questions.

3.9.5 Training of the research assistants

The study had two research assistants who assisted in data collection. These research assistants were trained for two days before engaging into data collection. They were given an explanation of the study purpose, objectives, rationale, inclusion and exclusion criteria, ethical aspects and how to administer data collection tools. The training emphasizes on the issues of confidentiality and anonymity in the sense that participants were not required to write their names on the questionnaire; only unique code numbers were used. Also the research assistants were instructed to check for the completeness of the questionnaires before handing to the principal investigator ready for data analysis.

3.9.6 Consenting Process

The nurses received information about the study while on duty and after agreement, they were asked to sign a written informed consent. This means participants were provided with information on the potential risks and benefits of participating. The consent forms addressed the purpose of the study and indicated the participants' willingness to take part in the study. It also made clear that, acceptance or refusal to participate in the study had no outward

consequences. The researcher emphasized to the participants that, they were free to withdraw from the study at any time and that they were free to not answer any question if they felt uncomfortable. (see appendix III &IV).

3.10 Ethical Consideration

The ethical clearance was sought and granted from MUHAS institutional review board (see appendix VII). Permission to conduct the study was obtained from the MNH management, the Executive Director of (MNH), Director of Clinical Services MNH, and finally the heads of the departments (ICU, CCU, EMD, HDUs and CICU) (see appendix VIII). Informed consent to participate in the study was obtained from study participants. The participants were assured of confidentiality and the questionnaires did not have any participant's name or any individual identity; only codes were used, therefore assuring that information was confidential. The benefits and risks of participation were stated clearly in the consent form. The questionnaires and observational checklists were kept by the researcher in a locked cupboard. Only the researcher had access to the keys.

3.11 Data Analysis

The researcher analyzed the data by using the SPSS (Version 20.0) program with assistance from a statistician from the MUHAS department of epidemiology and biostatistics. Chi-square test and Fisher exact test were performed to assess an association between demographics, resource availability and the level of knowledge and skills nurses have when caring for patients with life threatening arrhythmias, to observe the appropriateness. The probability of $p \leq 0.05$ considered significant. Frequency distribution, bar charts, and tables were used to provide overall and logical presentation and description of the data. Those participants who selected correct answers were considered to have high knowledge on a particular item. Participants who selected an incorrect answer were considered to have low knowledge in a particular area. All 13 items on the observational checklist were weighted with the digits 0 - 2. Weighting of 2 indicated Competent, 1 indicated Needs Improvement and 0 indicated Not Competent. The methods used for evaluation were verbalization, testing, skill observation, and simulation. The stated weight was converted into percentage which ranged from 0 – 100%.

The level of knowledge and skills were classified in two ways as follows: 100% - 50% = high and 49% - 0% = poor.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the results on the knowledge and skills in caring for life threatening arrhythmias among nurses working in critical care settings at MNH. The chapter is divided into sub-sections: demographic characteristics, knowledge, skills and barriers. The results are presented according to the objectives and the conceptual framework used in this study. Data was collected from 141 nurses, which gives 83% of all nurses working in critical care settings at MNH.

4.2 Distribution of participants according to Socio - demographic characteristics

Majority of the participants (44.0%) belonged to the age group of 31-40 years, with a mean age of 34.1years (SD = 7.3). More than three quarters of participants were females (79.4%). Majority (70. 2%) of the participants had diploma level of education in nursing. Majority of participants were from EMD by 54.6%, and 56.7% had experience in their current area for between five and six years.

Table 1: Socio-demographic characteristics of the study participants

Social-demographic characteristics of participants	Frequency(N=141)	Percentage
Age in years (Mean = 34.1, SD= 7. 3)		
20 – 30	57	40.4%
31 – 40	62	44.0%
41 – 50	17	12.1%

51 – 60	5	3.5%
Gender		
Male	29	20.6%
Female	112	79.4%
Educational qualification		
Certificate	14	9.9%
Diploma	99	70.2%
Bachelor	20	14.4%
Masters	8	5.7%
Working area		
Main ICU	23	16.3%
EMD	77	54.6%
CCU	7	5%
HDU-Ward 1	21	14.9%
Cardiothoracic ICU	13	9.2%
Experience in current working area(in years)	Minimum 0.6	Maximum 6 years
0 – 2	41	29.1%
3 – 4	20	14.2%
5 – 6	80	56.7%

4.3 Resource system availability and use

The participants indicated availability of resources pertaining to caring for patients with life threatening arrhythmias. Of 141 participants, 83.7% had BLS training while overall participants (100%) agree on the availability and use of cardiac monitors in caring for all critically ill patients. Only EMD and Main ICU identified to have different types of algorithms in caring for life threatening arrhythmias.

Table 2: Resources availability pertaining to caring for life threatening arrhythmias

Resource available	Frequency(N=141)	Percentage
Type of training attended		
EKG	90	63.8%
BLS	118	83.7%
ACLS	24	17.0 %
Others (based on arrhythmias)	1	0.7%
Support on the training attended		
Department support	57	40.4%
External sources (sponsors)	8	5.7%
self	20	20%
Others (during professional carrier development)	6	4.3%
Equipment		
Cardiac monitor	141	100%
12 lead EKG	77	54.6%
Others	10	7.1%
Algorithms/guidelines		
Pediatric cardiac arrest algorithms	45	31.9%
Adult cardiac support algorithms	51	36.2%
ACLS tachycardia algorithms	45	31.9%
Asystole/PEA algorithms	63	44.7%
Bradycardia algorithms	32	22.7%

4.4 Theoretical knowledge of nurses in caring for life threatening arrhythmias

The level of knowledge in caring for patients with life threatening arrhythmias among study participants was generally high, since of 141 (60 %) scored high knowledge, which ranged from 50% to 100%, while the mean score was 56.0% (SD: 17.4%). 55(39%) had low knowledge which ranged from 0% to 49.9%. The minimum score was 11.1% and the maximum score was of 88.8%, and the majority scored between 44.4% and 55.5%. The figure below shows the distribution of percentage scores on the knowledge questions.

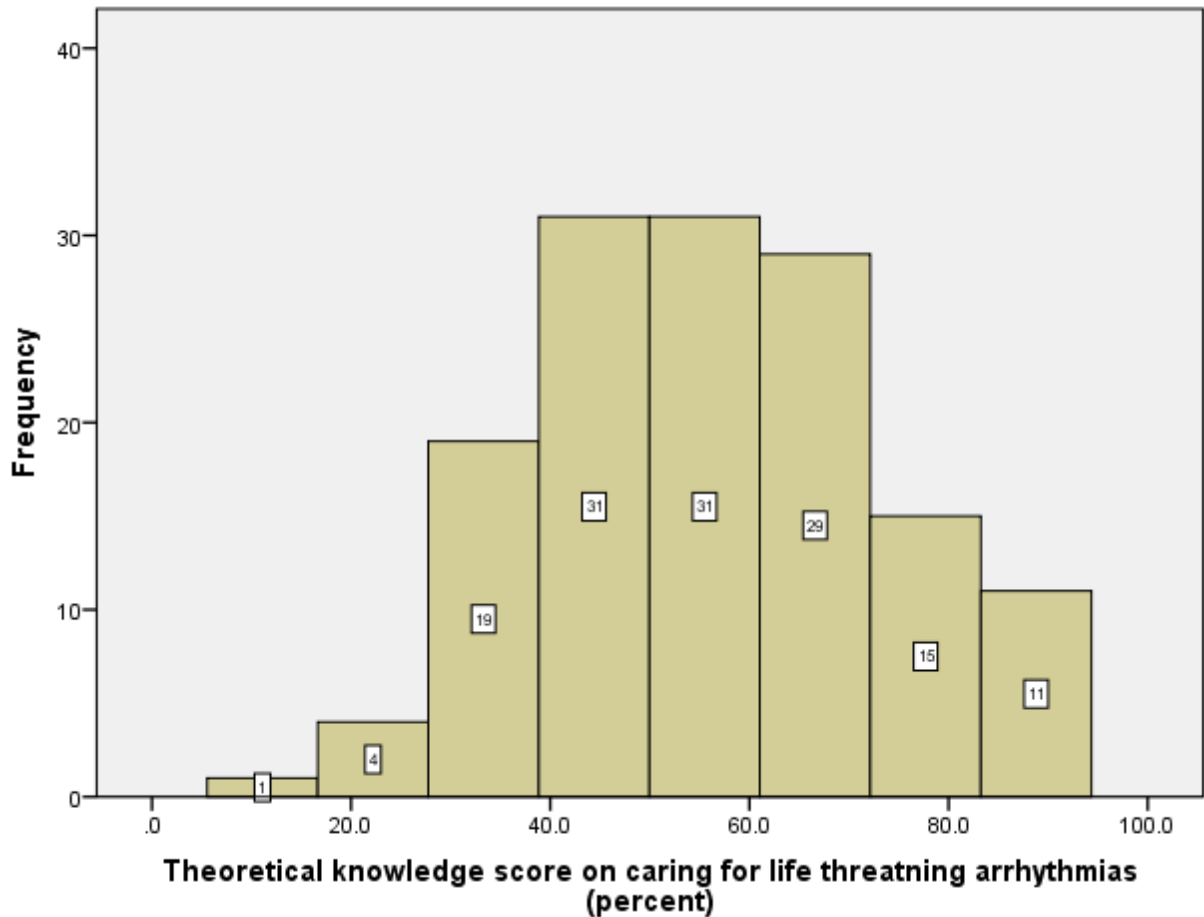


Figure 3: Distribution of scores on the theoretical knowledge

The results demonstrated that, participants had more knowledge on asystole EKG strip identification, as a total of 116 (82.3%) scored correctly, and they also demonstrated more knowledge by (95%) on their nursing care. On the other hand, knowledge deficiencies were in EKG strips of complete heart block (38.3%) and its management (41.1%).

Table 3: Distribution of knowledge score on each individual question

Question type	Frequency(141)	percentage
EKG Strip identification (ventricular tachycardia)	66	44.4%
EKG strip identification (asystole)	116	82.3%
EKG strip identification (complete heart block)	54	38.3%
EKG strip identification (ventricular fibrillation)	55	39%
nursing action if PEA and Asystole identified by the monitor	134	95%
Appropriate measure is indicated for unstable Ventricular Tachycardia with a pulse	56	39.7%
Nursing action on patient with pulseless VT / VF	93	66%
most important for the nurse to initiate first when a new ventricular tachycardia identified	83	58.9%

4.5 Observational skills results

The level of skills in caring life for threatening arrhythmias among study participants was generally poor since only (15.6%) of 141 had high knowledge, while mean score was 38.6 % (SD: 16.6). Of 141 (84.4%) scored low skills which range from 0 to 49.9%, while the minimum score was 11.5% and the maximum score was 92.3%. The figure below shows distribution of percentage on skills scores on caring for life threatening.

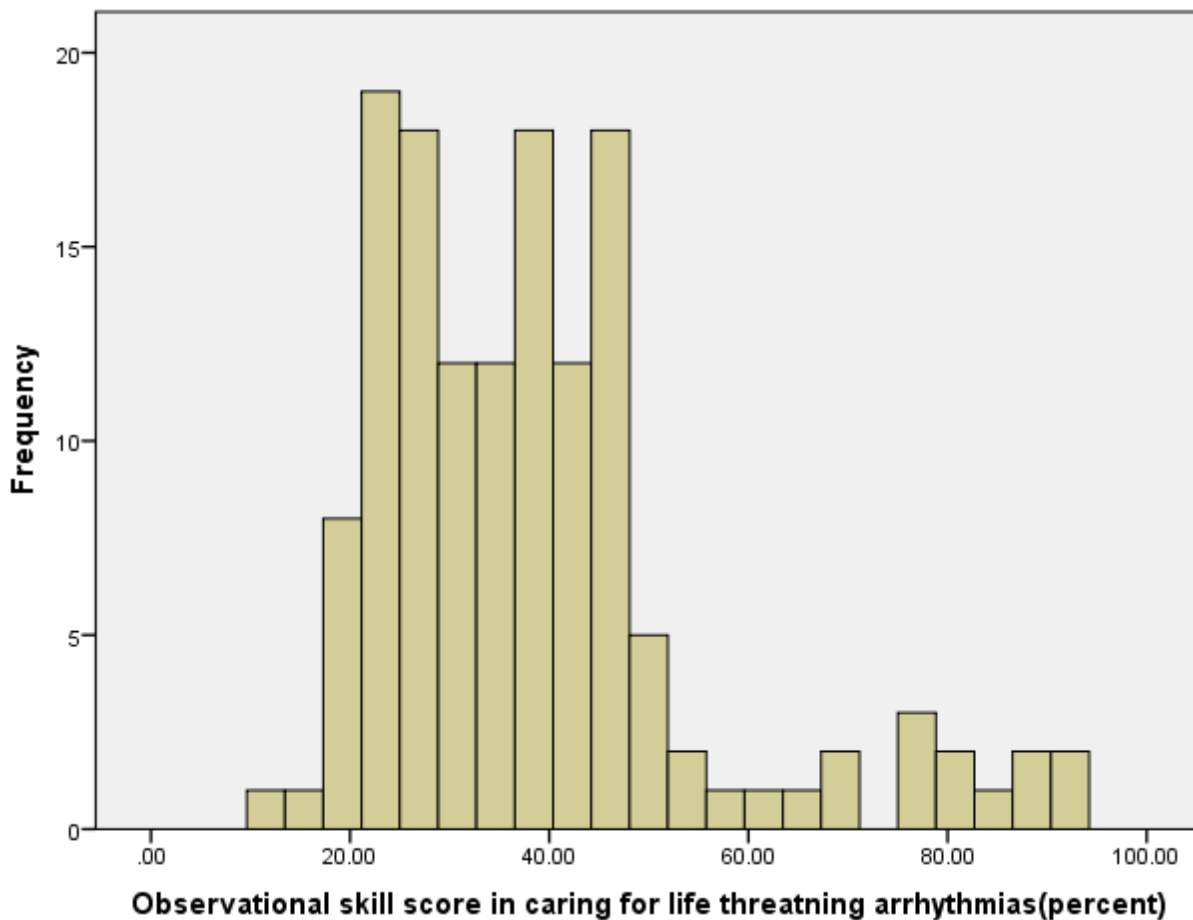


Figure 4: Distribution of scores on the observational skills

Although the participants had poor skills score, they demonstrated competent skills in electrode placement on the patient’s chest before connecting the patient to the cardiac monitor by 97.9%, and also in CPR skills by 78.7%. However, in skin preparation before application of electrode were not competent by 94.3%.

Table 4: Observation skills competence scores

SKILL TYPE	Frequency and Percentage		
	Competent	Need improvement	Not competent
Skin preparation before application of electrode	0	8(5.7%)	133(94.3%)
Correct lead placement on monitor	138(97%)	3(2.1)	0
Correct lead placement on 12 –Lead EKG	74(52.5%)	2(1.1%)	65(46.1%)
Conduction of EKG	80(56.7%)	1(0.7%)	60(42.6%)
Identification of P wave on EKG	13(9.2%)	28(19.9%)	100(70.9%)
Identification of QRS complex	16(11.3%)	48(34%)	77(54.6%)
Measure of heart rate	4(2.8%)	5(3.5%)	132(93.6%)
Ability to interpret abnormal found	2(1.4%)	14(9.9%)	125(88.7%)
Demonstrate CPR procedure	111(78.7%)	27(19.1%)	3(2.1%)
Mentioning 2 main drugs given during CPR	79(56%)	59(41.8%)	3(2.1%)
Demonstration of connection and recharge of defibrillator machine	8(5.7%)	52(36.9%)	81(57.4%)
Demonstrate pad/paddle placement during defibrillation	12(8.5%)	53(37.6%)	76(53.9%)
Demonstrate ability to defibrillation indication	13(9.2%)	14(9.9%)	114(80.9%)

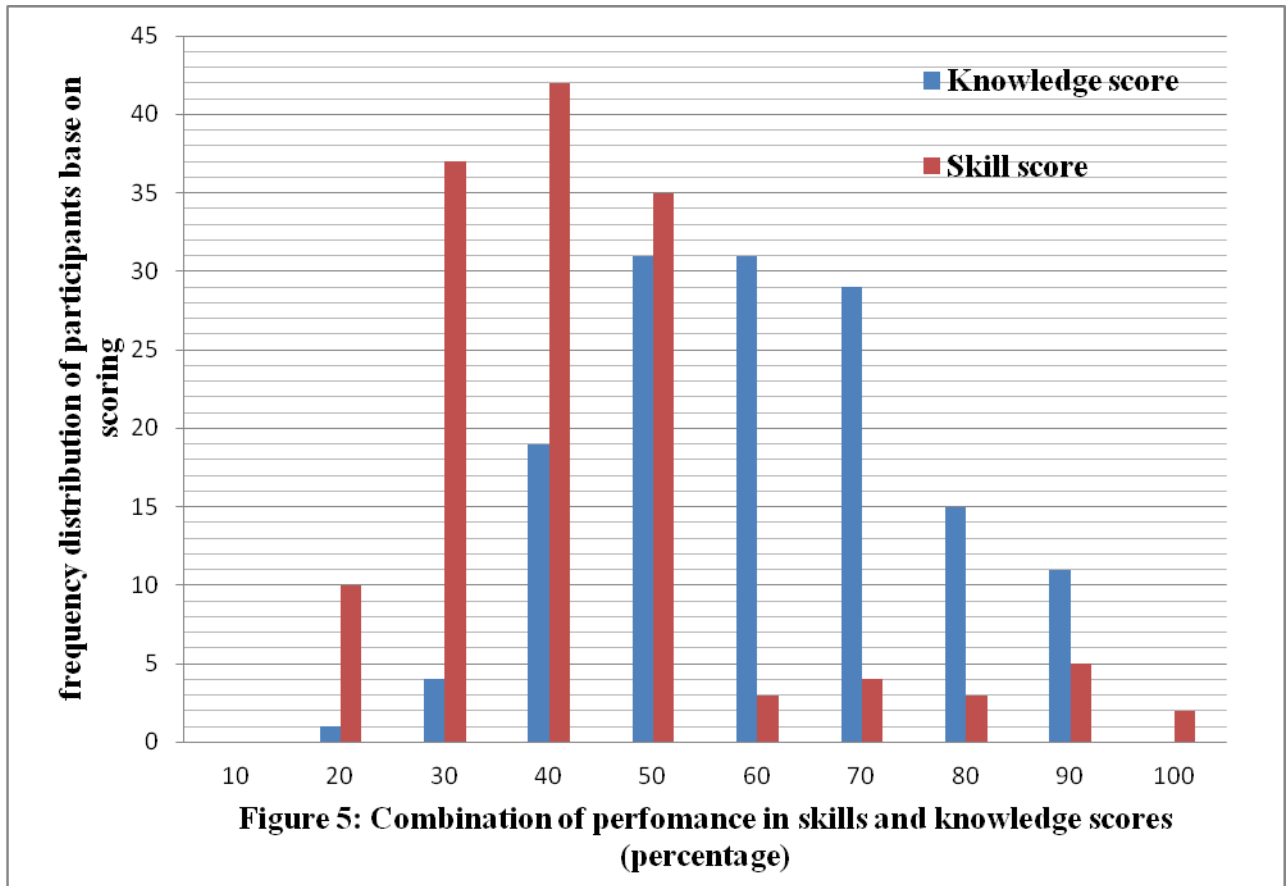


Figure 5: Combination of knowledge and skills scores

4.6 Statistical association between independent variables and level of knowledge score

An association has been found between ACLS training and level of knowledge by the P-value of $0.007 < 0.05$ (df 1). Another association has been found also in educational qualification and knowledge score by the P-Value $0.02 < 0.05$ (df 3).fishers extract test was used instead of X^2 due to occurrence of some observed number being less than 5.

Table 5: Association between theoretical knowledge and independent variables

variable	Low score	High score	P. Value
Educational qualification	55	86	0.02*
Working experience	55	86	0.186
0-2	20	21	
3-4	9	11	
5-6	26	54	
training			
EKG	31	57	0.3
BLS	46	72	1.0
ACLS	3	21	0.007**
Experience in equipment use			
12 lead EKG	26	47	0.4
Presence of algorithms /guidelines	24	39	0.97

* **Significant association = P < 0.05**

** **Significant association = P < 0.01**

4.7 Statistical association between independent variables and level of observational skills score

Strong association was found between educational qualification and observational skills by the P-value of 0.000 (df 3) =<0.05. Another association was found in EKG training course which P –value was 0.005(df 1) =, < 0.05.

Table 6: Association between observational skills and independent variables

Variable	Low score	High Score	P-value
Educational qualification	119	22	0.000 ***

Work experience	119	22	0.5
Working area	119	22	0.2
Training course			
EKG	67	19	0.005**
ACLS	19	7	0.1
BLS	97	22	0.06

****Significant association = P < 0.01**

*****Significant association = P < 0.001**

4.8 Barriers toward knowledge and skills in caring for life threatening arrhythmias

Of 141 participants (86.5%) reported to encounter barriers in acquiring knowledge and skills in caring for life threatening arrhythmias. The following being the major barriers identified; Stress caused by overwhelming workload (68.8%), followed by inadequate monitors or machines that detecting life threatening arrhythmias compared to patient's number (60.3 %).

Table 7: Barriers encountered by nurses in acquiring high knowledge and skills

Variable	Frequency (N =141)	Percentage
Barriers on Nurse's characteristics/competency		
Polices and standard for nurses regarding caring for to life threatening not well known to nurses	60	42.6%
No team support to assist others in caring for life threatening arrhythmias	54	38.5%
Stress caused by overwhelming workload	97	68.8%

Lack of confidences /feeling inadequacy in knowledge and skills	48	34%
Lack of adequate space to practice	8	5.7%
Other reasons like lack of not practicing frequently	4	2.8%
Barriers on resource system		
Lack of mandatory training on caring for life threatening arrhythmias	72	51.1%
No guidelines/algorithms on specific caring for life threatening arrhythmias	62	44%
Inadequate monitors or machine detecting life threatening arrhythmias compared to patients number	85	60.3%
Lack of incentive for those who are competent	57	40.4%
Other reasons like lack of equipment for practice like manikin	1	0.7%

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter discusses the results of assessment on the knowledge and skills of nurses in caring for life threatening arrhythmias in critical care settings at MNH. The discussion is based on the nurses' competency and resource system that help nurses to gain knowledge and skills on caring for life threatening arrhythmias. Also this chapter discusses the barriers faced by nurses in acquiring knowledge and skills on caring for life threatening arrhythmias. Majority of the study participants had diploma level of nursing education and most of them were female. Basic Life Support (BLS) and EKG training was attended by the majority while the minority had attended Advanced Cardiac Life Support (ACLS) training. Participants identified to have high level of knowledge while on the other hand demonstrated low skills level. The significant association was found between level of knowledge and skills and educational level. The major barriers identified that prevent nurses from having high knowledge and skills in caring for life threatening arrhythmias is stress caused by overwhelming workload.

5.2 Social - Demographic characteristics

The majority of the participants were in the age group of 31- 40 years of age; the fact suggests that most nurses are younger in the career. On the other hand, the high percentages of females imply dominance of females in the nursing profession. These results can be attributed to the numerical dominance of women in the nursing profession that dates back to its very beginnings under the guidance of its founder, Florence Nightingale (1820-1910). The large numbers of diploma holders indicates majority of nurses belong to this category at MNH. Majority of the nurses had 5-6 years of unit experience implying that they had adequate expose to the current working environment /settings.

5.3 Resource system in caring for life threatening arrhythmias

5.3.1 Educational trainings

Majority of the participants had training on Basic Life Support (BLS) and EKG although few had attended the Advanced Cardiac Life Support (ACLS) training course. This reflects efforts made by MNH to facilitate skills and knowledge when caring for critically ill patients among nurses. MNH has regular in house training, within critical care settings, which are conducted with lectures, discussion, simulations (mock codes), and bed side teachings. Sometimes there are special training courses and fellowships outside the country. Note that, MNH organizes training for nurses using internal and external experts, who are contracted to the hospital or with external organizations who collaborate with MUHAS or hospital. The trainings provided includes BLS, ACLS, EKG and many others, which provide nurses with knowledge and skills in managing patients in critical care settings. The current findings demonstrate a tremendous improvement on the number of nurses who attended trainings compared to the previous findings of Hillary ³⁸ who assessed the knowledge and skills of nurses on cardiopulmonary resuscitation in MNH to the same settings (EMD, Main ICU, HDU and paediatrics ICU). She found only 31 participants had BLS, while in ACLS only 12 had completed the course. Gabbot et al., ³⁹ support the efforts done by MNH by stating that it is up to the health care institutions to ensure their staff members receive adequate training on a regular basis to maintain their levels of competence.

5.3.2 Equipments/machines

All respondents reported using cardiac monitors in evaluating the physiological status of critically ill patients. This suggests that MNH has recognised the importance of using current equipment in diagnosis and management of physiological changes of patients' condition including life threatening arrhythmias by using special equipment. Despite of availability of a defibrillator in each setting, the study identified a deficit in knowledge and skills, including the connection and recharge of the machine, pad placement and identification of rhythms needing defibrillation. This could be due to inadequate exposure and specific training in the use of sophisticated machines. As shown in the conceptual framework, the presence and use of

equipment like cardiac monitors /EKG machines and defibrillators, are among the major factors that promote high quality of knowledge and skills in caring patients with life threatening arrhythmias. Similar findings were reported by Hazinski et al, (2010), when participants demonstrated a deficit of knowledge in the correct use of a defibrillator, recognition of a shockable rhythm, and shocking of the patient. Emphasis should be placed on training staff in the use of equipment present in the working station, hence when needed can be used by any one. The Resuscitation Council of UK (2005) suggests that members of the health care team including doctors, nurses; medical and nursing students should be well trained in the use of defibrillator machines, in order to smooth the progress of early defibrillation to patients if shockable rhythms are identified. According to Chan et al.,(2008) when hospitalized patients are identified to have VT/VF on the EKG strip in critical care settings, and then defibrillation is carried out within 2 minutes, the survival rate nearly doubled from 22% to 39% ($P < .001$). The AHA guideline (2015) insisted on application of defibrillation procedure when onset of VT/VF occurs soon after, neurological recovery is more likely, regardless of diagnosis or subsequent revascularization, and defibrillation without delay is the accepted standard of care.

5.3.3 Presence of algorithms/guidelines

The fact that only a few areas had life threatening arrhythmia algorithms, like EMD and Main ICU but not for all rhythms, indicates that MNH needs to invest more on algorithms of different types. The most common algorithms identified by participants were asystole and PEA, of which the majority identified the rhythms. Participants scored higher in their knowledge and skills of asystole and PEA, compared to other types of life threatening arrhythmias. Quality of care provided in specific life threatening arrhythmias undoubtedly was influenced by the absence of clear guidelines about the procedures that should be followed. Policies designed to promote the quality of care based on specific types of life threatening arrhythmias should place emphasis on education, practice and adherence to guidelines that are being drawn up by experts in their fields (Brown et al, .2006). On the other hand, participants had contradictory answers on the types of algorithms in the same working area, implying that there are no well organized strategies in using algorithms within the departments. Moreover,

most of the participants expressed a definite need for algorithms /guidelines that they could use to assess their practice and also evaluate the care provided to the patients, pertaining to the specific life threatening arrhythmias.

5.4 Theoretical knowledge of life threatening arrhythmias among nurses working in critical care settings at MNH

This study identifies knowledge in caring for patients with life threatening arrhythmias among nurses being high, since 60% of participants scored 50% and above. This may imply that nurses are reasonably knowledgeable in caring for life threatening arrhythmias. The reasonable knowledge among nurses may be attributed to the fact that MNH is the only national and big teaching hospital where several trainings are carried out within the hospital.

No or little literature was found on similar studies done in Tanzania, or even in Africa. One study with similar characteristics was done in India by Mohan(2010) who assessed cardiac nurse's knowledge regarding interpretation of life threatening arrhythmias and the emergency management, The results show that nurses had an excellent knowledge score where by 88.88% scored between 86% and 100%. On the contrary, in the USA, Keller and Raines (2005) reported that nurses had a deficit of knowledge in arrhythmias. Most studies pertaining to life threatening arrhythmias were conducted as quasi experiments within education programs in different Asian countries (Sayadi et al 2011, Hassan & Hassan, 2014, Lak et al, .2013, Sheilini & Devi 2014). Another study was done in the USA by Keller & Raines (2005) on dysrhythmia monitoring practice only. Therefore the findings of this study are little or incomparable with any other study, with similar characteristics on the dependent and independent variable used.

The participants demonstrated a high knowledge score on interpreting asystole on the EKG strip and gave the correct answer on its nursing care. These results confirmed that, proper presence and use of algorithms within the working areas increases the level of knowledge as reported. Therefore, the methods of training, contents covered, as well as the presence and use of algorithms in clinical practice may lead to improving knowledge and skills. These results are supported by Mohan (2010) of which the results showed that 100% of the participants interpreted ECG strips of asystole correctly.

On the contrary, the study found nurses had deficit of knowledge in EKG strip identification of complete heart block, as well as proper management of the patient, if it occurred. MNH should take into consideration these areas which have been identified to have deficiencies in effective rhythm-identification knowledge since will assist them in the patient's care. The same findings were identified in the study done in the USA by Keller and Raines (2005) which found nurses had a deficit of knowledge in interpreting complete heart block on the EKG strip. Keller and Raines (2005) found other nurses did not know what it was and others had never heard about it.

5.5 Nurses skills on caring for life threatening arrhythmias

The participants demonstrated a low level of skill when caring for patients with life threatening arrhythmias. Skill is defined by the Longman active study dictionary (Mayor, 2010) as "the ability to do something well after someone has been taught and has been practicing." Proper caring capacity needs nurses to have adequate to excellent skills to perform care safely and in an effective way, in order minimize patient's suffering and complications (Curly, 1998). Skills in advanced procedures like defibrillation, 12-Lead EKG interpretation and others, requires considerable repetition in training and clinical practice in order for the provider to be competent. But all in all, those with skills in recognising and treating life threatening arrhythmias should be well known to nurses as the first responders within the hospital. The same was observed in Sweden (Werner et al, 2014) where deficiencies in the nurses' EKG interpretation skills were observed by testing them on nine different EKGs.

The study identified incompetence in skills preparation before application of the electrode to the skin. Poor skin preparation minimizes skin impedance and maximizes the cardiac signal for capturing an impulse. Rubbing of the skin and shaving are both recommended by the manufacturer of electrodes, to ensure optimal electrode attachment and appropriate signals. Failure to complete skin preparation before electrode placement may cause inappropriate monitoring alarms in the patients with continuous EKG monitoring for life threatening arrhythmias.²⁶ The same was discovered in Norway by Pettersen et al.(2014), reported that , among 124 patients, only 43% who needed shaving were shaved, while for those who needed

wiping of the skin in order to remove oil, debris or any dirt, only 3% were rubbed with cloth. Also this study discovered re-use of electrodes to several patients, thus increase the chance of transferring infection from one patient to another. According to the World Health Organization (2002), nosocomial infections account for increased morbidity and mortality among hospitalized patients. Telemetry unit's electrodes and electrode leads are potential sources of nosocomial infections, as they are frequently shared among different wards and patients. Pettersen et al.(2014) identified contaminated leads as the source of outbreaks of antibiotic-resistant bacteria.

Although generally the observational skills score was low, the participants demonstrated high skills in locating electrodes on the patient's chest correctly in both cardiac monitors and for those who did a 12-lead EKG. This might be due to availability and use of electrodes while connecting the patients to the monitors, as mentioned by all participants used in caring for critically ill patients. Lead placement is very important in order to capture the correct electrical signal from patient onto the machine. Important decisions can be made based on findings of electrocardiographic monitoring after EKG analysis. Nurses should be encouraged to use correct electrode placement in order to get correct heart rhythms recorded during the monitoring period. The same results were reported by Pettersen et al.,(2014) during pre and post testing procedure, among 805 electrodes applied to patients, only 23% were misplaced.

5.6 Statistical association between independent variables and knowledge and skills in caring for life threatening arrhythmias

The current study found that nurse's knowledge and skills in critical care settings was associated with level of education. The higher the level of education, the increase in chance of understanding and learning advanced procedures. Having a higher educational level increases chances of mastering the English language as many lectures are conducted in English, and are also being carried out by experts from outside the country, and many books are in English. This finding is not dissimilar to the findings of El naeem et al., (2016) in an Emergency Unit in Egypt. The level of knowledge of the majority of studied nurses generally was poor, which could be related to the fact that the majority of participants hold nursing diplomas and most of

books are written in English as their media of communication, while Arabic is their learning language. According to Ballard(2003) it is the nurse's responsibility to engage in educational program as lifelong activities in order to maintain certain basic standards and professional competence, since the discovery of technology is a continuous process. It is a nurse's obligation to make important informed choices about their future in educational progress and the specialties in which they would like to be certified. Previous studies have shown that it is mandatory for the nurses to update themselves through educational or training programs in order to have a license to practice as a nurse, and this also is among the criteria for maintaining registration if one wishes to continue to practice (Drey et al., 2009, Halcomb, et al.,2009).

This study also found another association between ACLS training and level of knowledge. This might be influenced by the different advanced life saving procedures which are included in the course, like EKG rhythm interpretation as well as recognizing shockable rhythms and use of the defibrillator correctly. Similarly, respondents who reported having ACLS training, scored significantly better in all ACLS questions compared to those with no previous ACLS training (Passali et al., 2011). Also this study showed an association between EKG training and the levels of skills observed among critical care nurses at MNH. This might be influenced by the fact that most of the observed skills were based on a standardized EKG which was given to participants to interpret. On the contrary, Werner et al., (2014) did not find an association between EKG training course and observed skills score.

5.7 Barriers of nurses towards adequate knowledge and skills on caring for life threatening arrhythmias

In this study several barriers in acquiring high knowledge and skills in caring for life threatening were identified. Three major barriers were: Firstly, stress caused by an overwhelming workload due to the over flow of patients caused by the arrival of several cases from peripheral hospitals. This is due to the fact that Muhimbili National Hospital is the only hospital within the country that receives referral cases for further consultation and advanced care. MNH is overloaded with patients as evidenced by a large number of patients a bed, as

well as sleeping on the floor., In critical care settings, it is supposed to be one patient per nurse, but the reality is that one nurse can care for seven to fifteen patients per shift, however according to international standards of critical care, one nurse should care one patient at a time (ANA, 2000). Lambert and Lambert (2008) pointed out that among the factors of substandard nursing care; excessive workloads are the leading cause.

Another barrier identified was the lack of equipment like cardiac monitors or machines that detect life threatening arrhythmias in comparison to the number of patients requiring them. This was identified mainly in EMD since one resuscitation room might have four to six patients at the same time, whilst having one or even no functional cardiac monitors. The unavailability and poor quality of equipment influenced patient outcomes by giving wrong results and causing a huge degree of stress for the nurses. This could lead to running from one room to another to find a well functioning machine. Unavailability or non functional equipment directly affects the nurse's autonomy, the nature of the workload and the quality of patient care that can be delivered. Life-saving procedures in emergency situations should never be compromised because of malfunctioning equipment. If maintenance of equipment is consistent and thorough checks are routinely performed, those who are responsible for maintaining the equipment will be notified. The study done by Suraseranivongse et al., (2006), expressed that, non-availability of equipment—causes a delay in the provision of care, thus affecting a patient's outcome. Bucknall (2003) highlights the relationship between resource availability and the quality of care provided, and especially in critical care settings.

The study identified lack of mandatory training in caring for life threatening arrhythmias. MNH has the rule that every newly employed nurse should receive preliminary training on basic procedures, including BLS before practice. The hospital should put emphasis on life threatening arrhythmias trainings as new diagnostic equipment is available. This is supported by Jevon (2004) by emphasizing nurses to be encouraged to develop skills through advanced procedures such as using airway adjuncts, intra venous canulation, ECG recognition, the administration of specific drugs and defibrillation. New staff members should have resuscitation training as a compulsory part of their induction program, and all training should

be recorded in a central data base system Jevon (2004). It is therefore necessary to create strategies to encourage nurses to engage in continuous education and training, and officially recognise their participation.

5.8 Application of synergy model to the study findings

The modified synergy model was used to discover the level of knowledge and skill the nurses have about caring for patients with life threatening arrhythmias in critical care settings at MNH. The modified synergy model (figure 2) viewed that a high level of knowledge and skill for nurses can be achieved through nurses' competence, in conjunction with resource availability and functioning systems and thus the synergy approach can be achieved. The researcher conceptualized that if all factors that work as barriers to the delivery of effective care in life threatening arrhythmias, situation could be minimized, nurses would have a higher level of knowledge and skills. The actions of nurses are designed to help the patients make the transition from their state of life threatening illness, to a survival state, since the overall goal in caring for life threatening arrhythmias on time is to prevent premature death and reduce neurological disabilities.

The findings revealed that the nurses' were competent in their knowledge, meaning that nurses were exposed formal trainings like BLS, EKG and ACLS. During the actual process of managing life threatening arrhythmias, nurses use their competence to make clinical inquiries about abnormal EKG strips and identify the rhythm, which will assist their clinical judgment in caring for the patient, as they have had training. MNH understands they have an obligation to ensure the availability trainings, and resources such as cardiac monitors, defibrillators and 12-lead EKG by doing this MNH produces competent nurses, who are able to use their clinical judgment and their critical thinking in order to obtain the best patient outcome. The nurses were competent in effective use of the resources available like 12 lead EKG and cardiac monitors, as 100% of the participant's used them. In other ways, nurses demonstrated incompetence in some of the resources that are used in caring for patients with life threatening arrhythmias, like defibrillators and algorithms. Nevertheless nurses demonstrated competent knowledge and skills in management of the algorithms that were available in their area,

scoring a high percentage and demonstrated incompetent knowledge and skills in algorithms which are not present or found in specific areas.

Dunn (2004) pointed out the importance for learners are to learn how to translate their knowledge into practical skills and make sound clinical judgments in chaotic, complex and anxiety-provoking circumstances. An ability to integrate knowledge, skills, attitudes and understanding, and to understand the impact of multisystem influences on a patient, is crucial for being able to make sound clinical judgments. According to the conceptual framework, the majority of nurses in Critical Care Settings at MNH were not able to demonstrate effective skills; this proved that their practical skills might not be as effective as they should be.

5.7 Limitation

Methodological consideration

This study was conducted in a single large hospital; the external validity is relative and uncertain, so multiple hospitals should be involved in another study in order to achieve validity. The pre determined sample size was 130, but the researcher wanted to increase representativeness in this study, hence decided to include all nurses working in critical care settings. There were circumstances like annual leave, maternity leave, training courses in and outside of the country, so some participants were not available during data collection. Also there were non-respondents; about 12 participants who comprise 7% of critical care nurses. Due to these reasons, the researcher did not meet her objective of involving all nurses working in critical care settings at MNH. Having some nurses not respond and also missing some study participants did not affect the validity of this study finding since 83% of the study population was involved.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

The current study revealed that nurses working in critical care settings have high knowledge but was observed to have low skills in caring for patients with life threatening arrhythmias. A high level of knowledge might be due to the MNH authorities empowering nursing staff to participate in the use of different types of resources, system like training, and the use of machines and algorithms/guidelines. However skills in caring for critically ill patients might not have been emphasized, as proper usage of the available resources and equipment or guidelines was observed to be minimal. Significant association was found between the level of education, and skills and knowledge in caring for patients with life threatening arrhythmias. The reason might be that, a higher educational level increases learning, and the understanding of advanced life saving procedures. No association was found between BLS training, age, gender or years of work. The identified barriers in acquiring high knowledge and skill, include stress caused by workload, due to the number of patients being referred to MNH as the only national hospital, non-functioning machines, so there is not one for every patient, and lack of mandatory training on how to care for life threatening arrhythmias, affected the implementation of optimal care. The synergy model created by AACN used in this study identifies an approach of how to improve nurse's skills by combining knowledge and resources, to provide appropriate care to patients with life threatening arrhythmias.

6.2 Recommendations

Upon finishing this study, I would like to recommend the following in order for the nurses to have increased knowledge and skills when caring for patients with life threatening arrhythmias:

1. There is a need for MNH directorate of nursing and quality should make a policy that

will promote capacity building for nurses by improving knowledge and skills in caring for critically ill patients. It should include issues of periodic staff training on the critical care procedures, translation of research findings into practice and involve retaining trained staff on the units where they are able to perform effectively.

2. Efforts should be made by clinical nurse trainers present in each department in encouraging and supporting nurses to translate their knowledge into practical skills. This can be done by designing and implementing a continuous professional practical skills program on how to care for life threatening arrhythmias in critical care settings at MNH. Special focus should be based on the methods of teaching, use of guidelines/ algorithms, protocols and charts for proper practice. In addition, introduction and use of specific life threatening arrhythmias algorithms and guidelines should be known and made suitable to all individuals within the critical care settings. Implementation of this recommendation will require a multifaceted approach which will combined input from practicing nurses, nurse-educators, directorate of nursing and hospital management at MNH, Tanzanian nurses' council, and be in conjunction with the Ministry of Health of Tanzania.
3. To ensure standardized health care provision at MNH, Hospital management should address the issue of patient overload, to policy makers at the Ministry of Health in Tanzania. The ministry of Hhealth should find a way to modify infrastructures within the regional hospitals so that every hospital has highly equipped and trained nurses in critical care settings, which will minimize referral cases to MNH. This approach needs multi-sectoral and multi-disciplinary collaboration in order to reach targeted goals which include equipment, and staffing, as well as infrastructures.
4. A similar study is recommended that will use mixed methods and also involve more than one hospital in order to gain more insight into the knowledge and skills of nurses when caring for patients with life threatening arrhythmias in critical care settings. This

will help to explain many of the findings including the discrepancy between the scores and the nurses' perception about their current knowledge and skills. Also this will ensure generalisation of the study findings, can be made with all hospitals, not just MNH.

6.3 Dissemination of the findings

The results of this study generate important information of the knowledge and skills of nurses when caring for patients with life threatening arrhythmias in critical care settings, by highlighting gaps in knowledge and skills. These results have been presented during the viva voce dissertation defense for Masters Degree in Nursing in Critical Care and Trauma award. The report will be presented to MNH authorities, especially the directorate of nursing and quality and EMD, HDUs (ward 1), main ICU, CCU and CICU as the responsible departments. A copy will be given to MUHAS library. The results will also be published in a peer-review nursing journal for the wider benefit of policy making to improve management of life threatening arrhythmia, along with the knowledge and skills of nurses. Furthermore, these results will be presented during workshops and scientific conferences both locally and internationally

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APPENDIXES:

Appendix I- Questionnaire English version

Nurses code no _____

Knowledge of nurses regarding life-threatening arrhythmias and their management

SECTION A:

DEMOGRAPHIC DATA

Please answer each question (Mark only one item)

1. Please specify your age in years _____

2. Please point out your gender

1) Male

2) Female

3. Please point out your academic qualification.

1) Certificate in nursing (EN)

2) Diploma in Nursing (RN)

3) Bachelors in Nursing

4) Masters in Nursing

5) Other (please specify).....

4. Please indicate your current working area.

1) Intensive Care Unit

2) Emergency medicine department

3) Coronary care unit

4) Highly dependent unit

5) Cardiac intensive care unit

5. Please indicate years of experience in your current working area in years. _____

SECTION B:

ASSESSMENT ON AVAILABILITY OF THE RESOURCE SYSTEM

6. A) Please indicate any training course on EKG attended on

- 1) YES
- 2) NO

If your answer is YES respond to question 6 B.

If your answer is NO do not respond to question 6 B.

6. B) who assisted you in arranging for your training program?

- 1) Self
- 2) Sponsor
- 3) Support from the department/hospital you're working in
- 4) Others (specify).....

7. Please indicate any training courses in emergency life support that you have

Attended that deal with management of cardiac arrhythmias? (choose all applicable)

- 1) Basic Life Support training
- 2) Advance Cardiac Life Support training
- 3) EKG training
- 4) Other (specify).....

8. Please mention types of machines/ items/equipment used to record and monitor cardiac activity available in your working area?

- 1) Cardiac monitor
- 2) 12 Lead EKG machine
- 3) Others (specify).....

10. Mention types of dysrhythmias algorithms present in your working areas?

- 1) pediatric cardiac arrest algorithm
- 2) Adult Cardiac Arrest Algorithm
- 3) ACLS Tachycardia Algorithm
- 4) Asystole or pulseless electrical activity (PEA) algorithm
- 5) Bradycardia Algorithm
- 6) Others (specify).....

SECTION C:

LIFE-THREATENING ARRHYTHMIA KNOWLEDGE AND SPECIFIC CARING MEASURE TO BE TAKEN

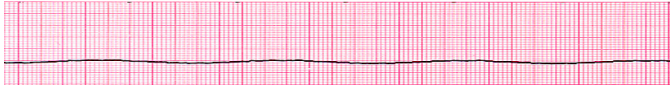
Below are some of EKG strips displayed. Please choose the correct answer of type of life threatening arrhythmias based on EKG strip using P and QRS morphology (tick the answer)



(From RnCeus Interactive. Used with

permission)

- 1) Normal Sinus Rhythm
- 2) Ventricular tachycardia
- 3) Complete heart block
- 4) Ventricular fibrillation

12.  (From RnCeus Interactive. Used with permission)

- 1) Torsades de Pointes
- 2) Ventricullar fibrillation
- 3) Complete heart block
- 4) Asystole

13.  (From RnCeus Interactive. Used with permission)

- 1) Complete heart block
- 2) Ventricular tachycardia
- 3) Asystole
- 4) Ventricullar fibrillation

14.  (From RnCeus Interactive. Used with permission)

- 1) Supra Ventricular tachycardia
- 2) Ventricullar fibrillation
- 3) Atrial fibrillation
- 4) Asystole

15. What are the appropriate nursing actions that should be done for the patient with Pulseless electrical activity or Asystole?

- 1) Check for pulse, call for help, initiate CPR
- 2) phone and give information to cardiology unit
- 3) Monitor pulse ever 40 minutes
- 4) Wait to get instruction from the doctor

16. What appropriate measure is indicated for unstable Ventricular Tachycardia with a pulse?

- 1) IV Amiodarone bolus and drip
- 2) Defibrillation with 360 joules
- 3) Synchronized Cardioversion
- 4) Give the patient nifedipine sublingual

17. In case the nurse identify patient has pulseless ventricular tachycardia or Ventricular fibrillation. What should the nurse do?

- 1) Assess the patient, call for help, Start CPR connect defibrillator
- 2) Ask the patient to cough or bear down
- 3) No intervention is necessary because he is already in hospital
- 4) When in danger, when in doubt, run in circles, scream and shout.

18. Which intervention is the most important for the nurse to initiate first when a new ventricular tachycardia (wide QRS complex) is identified by the monitor?

- 1). Tell the relative to go out
- 2) Do 12 Lead ECG to confirm and prepare for shockable rhythms
- 3) Tell the patient to take deep breath
- 4) Give oxygen through mask

19. What appropriate measure should benefit the patient with Complete heart block?

- 1) Give IV Magnesium as ordered
- 2) Connect defibrillation
- 3) Prepare the patient for pace making
- 4) All of the above

SECTION D:

BARRIERS ON KNOWLEDGE AND SKILLS REGARDING IN CARING FOR LIFE THREATENING ARRHYTHMIAS

20. A) Are there any barriers in your department that prevent nurse from having adequate knowledge and skills in caring for life-threatening arrhythmias cases?

- 1) Yes
- 2) No

If your answer is **YES** please respond to questions below

21. The following are barriers toward nurse's competency on caring for life threatening arrhythmias (Tick all applicable)

- 1) Policies and standards for nurses regarding caring for life threatening arrhythmias not known to nurses
- 2) Lack of adequate spacing to practice properly
- 3) No adequate team support to assist nurses to conduct or in interpreting EKG
- 4) Stress caused by an overwhelming workload
- 5) Lack of confidence/feelings of inadequacy
- 6) Others(specify).....
.....
.....
.....
.....

22. The following are barriers toward resource system on caring life threatening arrhythmias
(tick all applicable)

1. Lack of mandatory training on caring for life threatening arrhythmias
2. No algorithms / guidelines available regarding to caring for specific type of life threatening arrhythmias
3. Inadequate EKG and cardiac monitors compared to number of patient's number or not functioning machines
4. Lack of incentives for those who are competent
5. Others

specify.....
.....
.....

Thank you for your participation

Appendix 1I -Observation check list

Nurses ‘Code Number: _____

Date _____ Start time of observations _____ End time of observations _____

Observation checklist for nurses’ skills competency regarding caring for life threatening arrhythmias

	Rate key	Method	Investigator’s initials and signature
1.Skin preparation before placing electrode			
2. Correct Lead placement on patient using cardiac monitor			
3 Correct lead placement in 12 leads EKG			
4. Conducting 12 leads EKG			
5. Identification of P waves on EKG			
6. Identification of QRS complex on EKG			
7. Measure heart rate based on EKG 12 leads			
8. Interprets Abnormality found			
9. Demonstrates CPR procedure			
10. Mentioning at least 2 drugs used during CPR			
11. Demonstrate how to connect and charged defibrillator machine			
12. Demonstrate proper placement of defibrillator pads			
13. Mention Indication of defibrillation			

Rating Key: 2=Competent, 1=Needs Improvement, 0=Not Competent

Method of evaluation: **Verbalized**, **Tested**, **Skill** observation, **Simulation**

Comments and/or Action Plan:

Investigator's signature _____

Appendix III-consent form (English version)

INFORMED CONSENT



MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED HEALTH SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS

ID NO

Greetings! My name is **DINNAH ISSA RUHWANYA** a student nurse pursuing MSc Nursing –Critical care and Trauma. Currently, I am conducting a study on **Assessment of knowledge and skills in caring for life threatening arrhythmias among nurses working in critical care settings at Muhimbili National Hospital**

Purpose of study

The purpose of this study is to improve nurse’s knowledge and skills in caring for patients with life threatening arrhythmias in critical care settings at Muhimbili National Hospital.

Sponsor:

Self sponsored

What participants involve

Your participation in the study will be at your own choice and you are free to decide without any adverse reactions. Participation will require you to answer questions in relation to life

threatening arrhythmias monitoring and caring with 20 questions and an observation check list consisting of 13 questions. It will take 20-30 minutes to fill out the questionnaire and 20 minutes for observational check list.

Confidentiality

All information collected will be secret and this will be maintained by use of codes and no names will be asked or required. Information collected on questionnaire will be entered into computers with only the study identification number and if the results of the current study will be published or presented in a scientific meeting, names and other information that might identify you will not be used.

Benefits

There will be no direct benefit for your participation; however the study findings will help the clinical nursing practitioners to improve the provision of care to patients with life threatening arrhythmias on the basis of their individual needs. That can be achieved by alerting the policy makers on the magnitude of the situation which will lead to construction of proper policy for efficient and effective clinical management on arrhythmias.

Compensation:

There will be no compensation of any kind for participation.

Risk

The study will not harm you physically, psychologically or emotionally.

Rights to Withdraw and Alternatives

Participation in this study is voluntary and you have the right to refuse to participate or withdraw from the study even if you have already given your consent. Refusal to participate or withdraw from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Who to Contact

If you ever have questions about this study, you should contact the principle investigator **Dinnah Issa Ruhwanya; telephone no 0718916074**, P.O.Box 65000, Dar-es Salaam. If you ever have questions about your rights as a participant, you may contact or call Director of Research and Publications Committee **Prof. Said Aboud** at MUHAS, P.O. Box 65001, Dar es Salaam. Tel: 2150302-6.

Signature:

Do you agree to participate?

Participant agrees Participant does NOT agree

I, _____ have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of the research _____ Date _____

Appendix 1V-Consent form (Swahili version)

Ridhaa ya Kushiriki Katika Utafiti

OMBI LA RIDHAA YA KUSHIRIKI KATIKA UTAFITI KUHUSU UCHUNGUZI WAUELEWA WA WAUGUZI KWA NADHARIA NA VITENDO KATIKA KUTOA HUDUMA KWA WAGONJWA WENYE MAPIGO YA MOYO YANAYOHATARISH MAISHA KATIKA MAELEO YA WAGONJWA MAHUTUTI HOSPITALI YA TAIFA MUHIMBILI.

Habari, Jina langu ni Dinnah Issa Ruhwanya, umechaguliwa kushiriki katika utafiti unaohusu uelewa wa wauguzi katika utunzaji wa wagonjwa wenye mapigo ya moyo yanayo hatarisha maisha utakao fanyika katika maeneo yanayotunza wagonjwa mahututi, hospitali ya taifa ya Muhimbili.

MADHUMUNI YA UTAFITI:

Lengo kuu la utafiti huu ni kuongeza ufanisi wa wauguzi katika kuhudumia mapigo ya moyo yanayohatarisha maisha ya mgonjwa katika vitengo vinavyo hudumia wagonjwa mahututi.

JINSI YA KUSHIRIKI:

Kama utakubali kushiriki, utafanyiwa usaili wa vitendo na kuulizwa maswali jinsi unavyoelewa kuhusu mapigo ya moyo yanayohatarisha maisha ya mgonjwa, na pia utoe maoni yako nini kifanyike ili kusaidia wauguzi ili waweze kutoa huduma zinazostahili wanapotambua uwepo wa mapigo ya moyo yanayohatarisha maisha. Endapo utaridhia kushiriki katika utafiti huu utakuwa ni mmoja kati ya wauguzi wanaofanya kazi katika maeneo ya wagonjwa mahututi watakaoshiriki katika utafiti huu .Pia unahusisha maswali 21 ya ufahamu na maswali 13 kwa vitendo.

USIRI:

Taarifa zote utakazotoa kwenye utafiti huu zitatumizwa kwa usiri mkubwa. Taarifa zitakazokusanywa zitaingizwa kwenye kompyuta, zikiwa katika namba ya siri. Taarifa zitatumika kwa ajili ya utafiti huu tu.

HAKI YA KUJITOA KWENYE UTAFITI:

Ushiriki wako katika utafiti huu ni hiari, na hakuna adhabu yoyote endapo hutaridhia au kuamua kusitisha katika utafiti.

FAIDA NA ATHARI:

Hakuna athari au faida zozote kwako katika kushiriki katika utafiti huu na pia hakutakuwa na gharama zozote au posho kwa ajili ya ushiriki ila itachukua muda wako tu. Ni matumaini yangu kuwa utafiti huu utakuwa ni wenye manufaa kwako na jamii kwa ujumla kwani taarifa zitakazokusanywa zitasaidia kutambua jinsi gani wauguzi wawezeshe kutoa huduma kwa wagonjwa wenye matatizo ya mapigo ya moyo yanayohatarisha.

Nani wa kuwasiliana nae?

Endapo una swali linalohusiana na utafiti huu, tafadhali usisite kuuliza. Majibu yako yatakuwa siri. Endapo taarifa hizi zinachapishwa kwa namna yoyote taarifa zozote zinazoweka kufanya utambulike hazitajumuishwa.

Kama una swali au ungependa kupata maelezo zaidi baada ya mahojiano, unaweza kuwasiliana na mimi **Dinnah Issa Ruhwanya** kupitia namba 0718916074 au kwa, Mkurugenzi wa Utafiti na Machapisho ya Chuo, **Profesa Said Aboud**, Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili S.L.P 65001 Dar- es- Salaam.

Una maswali?

Je unakubali kushiriki kwenye utafiti (weka alama)

Ndiyo..... Hapana.....

Mimi....., nimeelezwa / nimesoma maelezo haya , maswali yangu yamejibiwa.

Nimekubali kushiriki kwenye utafiti huu

Sahihi ya muuguzi

Sahihi ya shahidi.....

Sahihi ya mtafiti.....

Tarehe.....

Appendix V- Ethical clearance

Dinnah Issa Ruhwanya

P.O BOX 21860,
Dar es Salaam.
24/February/2016

Director of Postgraduate studies,
MUHAS,
P.O.BOX 65001,
Dar-es-salaam.

u.f.s: Dean of School of Nursing,
MUHAS,

u.f.s: Head Department of clinical Nursing,
MUHAS,

u.f.s: Research Supervisor
School of nursing-MUHAS

Dear sir/madam,

RE: SUBMISSION OF RESEACH PROPASAL FOR ETHICAL CLEARANCE

The above mention heading is concern.

I am a post Graduate second year student under program of Masters in Nursing Critical care & Trauma; with Registration No. HD/MUH/T.197/2014.

I'm submitting research proposal titled **Assessment of knowledge and skills in caring for life threatening arrhythmias among nurses working in critical care settings at Muhimbili National Hospital**, for ethical clearance as per university requirement.

Yours faithfully,

.....

Dinnah Issa Ruhwanya

Appendix V1- Permission to use EKG wave -form

Inbox

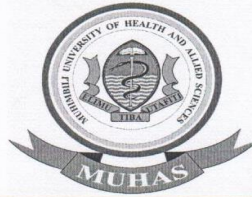
★ <u>DINNAH RUHWANYA</u>	Thu, March 25, 2016 at 7:07 AM
★	Thu, March 25, 2016 at 11:57 AM
Paul Bauer <rnceus@rnceus.com> To: DINNAH RUHWANYA <rdinnah@gmail.com> Cc: Madelaine Lawrence <madlawren@yahoo.com> Reply Reply to all Forward Print Delete Show original	
Dinah	
<p>RnCeus Interactive, LLC will grant limited permission to reproduce the asystole,VT,VF and complete heart block graphics exclusively for the term and purpose of your critical care research within the Muhimbili National Hospital, Tanzania.</p> <p>Thank you for contacting RnCeus.com, you have our best wishes for the successful completion of your research.</p> <p>Paul Bauer RnCeus.com</p> <p><u>- Hide quoted text -</u></p> <p>On 24/3/16 9:07 PM, "DINNAH RUHWANYA" <rdinnah@gmail.com> wrote:</p> <p>Hi</p> <p>>I have visited your website provided ECG strip for better learning</p> <p>>interpretation.</p> <p>>Please I would like your permission to use some of the ECGs in my</p> <p>>research preparing</p>	

>for staff nurses working in critical care settings at Muhimbili
>national hospital in Tanzania. This research is a part of my masters
>of critical care and trauma in nursing qualification.
>This research is intended to assess knowledge and skills in caring for
>life threatening arrhythmias. Using some your EKG strip will assist me
>if nurses will be able to identify specific types when nurses
>monitoring patient by using cardiac monitor /12lead EKG machine. The
>one I want to use are for asystole,VT,VF and complete heart block
> Please let me know if this is OK.
>Thank you
>Dinnah Ruhwanya, RN, MSC(STN)

Appendix VII: Ethical clearance letter

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES**

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz



Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. MU/PGS/SAEC/Vol. XIV/

24th March, 2016

Ms. Dinnah Issa Ruhwanya
MSc. Critical Care & Trauma Nursing
MUHAS.

**RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED
"ASSESSMENT OF KNOWLEDGE AND SKILLS IN CARING FOR LIFE
THREATENING ARRHYTHMIAS AMONG NURSES WORKING IN CRITICAL
CAE SETTING AT MUHIMBILI NATIONAL HOSPITAL"**

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 23rd March, 2016 to 22nd March, 2017. In case you do not complete data analysis and dissertation report writing by 22nd March, 2017, you will have to apply for renewal of ethical clearance prior to the expiry date.

Prof. Andrea B. Pembe
DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Nursing

Appendix VIII: Permission letter from MNH to conduct research

MUHIMBILI NATIONAL HOSPITAL

Cables: "MUHIMBILI"
Telephones: +255-22-2151367-9
FAX: +255-22-2150534
Web: www.mnh.or.tz



Postal Address:
P.O. Box 65000
DAR ES SALAAM
Tanzania

In reply please quote:
Ref: MNH/TRC/2016/672

04/04/2016

Head Emergency Medicine Department
Muhimbili National Hospital.

RE: PERMISSION TO CONDUCT RESEARCH AT MNH NO: 672

Name of Researcher	Dinnah Issa Ruhwanya
Research Title	Assessing of knowledge and skills in caring for life threatening arrhythmias among nurses working in Critical Care setting at Muhimbili National Hospital in Tanzania.
Type of Research	Descriptive cross-sectional study
Supervisor	Dr.Edith Tarimo Mr. Menti Ndile
Valid Between	April – September 2016 (6 months)

- The above named has been allowed to conduct the stated research.
- Please accord her with the necessary assistance and cooperation.

Sincerely,

Faraja Chiwanga
DR. Faraja Chiwanga

Ag: Head, Teaching, Research and Consultancy Coordination Unit

Appendix IX: Standard tool of EKG used during observational skills