

**VITAL SIGNS RECORDING PRACTICES AND USE IN DECISION
MAKING FOR THE CARE OF CRITICALLY ILL PATIENTS IN
GENERAL WARDS: DESCRIPTIVE STUDY IN DAR ES SALAAM,
TANZANIA**

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**MSc Nursing (Critical Care and Trauma) Dissertation
Muhimbili University of Health and Allied Sciences.
October, 2021**

Muhimbili University of Health and Allied Sciences
Department of Nursing



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By

Halima Mhina

**A dissertation submitted in (partial) Fulfilment of the Requirements for the Degree of
Masters of Nursing (Critical Care and Trauma) of Muhimbili University of Health and
Allied Sciences
October, 2021**

CERTIFICATION

The witnesses certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled; “*Vital signs recording practices and use in decision making for caring critically ill patients in general wards: A descriptive study in Dar Es Salaam, Tanzania 2021*”, in (partial) fulfilment for the requirement for Master’s degree of Science in Nursing (Critical Care and Trauma) of Muhimbili University of Health and Allied Science.

Dr. Menti Ndile PhD, RN (Main Supervisor)

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Date

DECLARATION

I, **Halima Mhina**, declare that the materials in this project with the title “*Vital signs recording practices and use in decision making for caring critically ill patients in general wards: A descriptive study in Dar Es Salaam, Tanzania 2021.*” It has never been submitted or presented in any other higher education institute for the purpose of obtaining degree of masters of Science or any other related award. To the best of my understanding and belief, this research project contains no material previously published or written by another person except where due reference is made and have used the Vancouver system of referencing.

Signature_____ Date_____

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DEDICATION

This dissertation is dedicated to my loving and ever-supportive husband Mr. Salum Kombo; without his help and encouragement; I would never have completed this challenge. I would also like to dedicate this report to my children and family; Zaliah, Jackson, and junior; also to my pretty granddaughter Tamar; they remained calm, sweet, and relatively relaxed from the unlimited hours “mom” spent studying and writing.

ABSTRACT

Introduction: Monitoring vital signs is essential to discovering and responding to patient deterioration. The value of vital sign recording influences clinical decision making. Delay to respond from abnormal vital signs among critically ill patients may cause hemodynamic instability leading to unplanned ICU admission, cardiac arrest, and deaths. Hence general ward nurses need to have positive attitudes, good practices, and good decision making.

Aim: To assess the vital signs recording attitudes, practices and clinical decision making for the care of critically ill patients in general wards at Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania.

Methodology: The study was hospital based descriptive cross-sectional that involved 240 general ward nurses who were selected using convenience non probability sampling technique. It was conducted at Muhimbili National Hospital. Structured questionnaires were used to collect data, and SPSS version 20 was used for data analysis. Univariate data were analysed using descriptive statistics while Bivariate and multivariate were analyzed using logistic regression models. Results were presented in forms of tables.

Results: Majority of participants 55.8% were working in medical wards and most of them 36.7% had worked from 2 to 3 years. Above half of respondents 54.2% had positive attitude regarding the usefulness of vital signs. There was a statistical significance association in experience from 2 – 3 years with attitudes (AOR: 16.759 95%CI (5.72- 49.15; P value =0.000). also, there was a statistical significance association in medical wards with attitudes (AOR: 0.04 CI 95% CI (0.01-0.10); p value =0.000). Majority of the nurses 52.5% had poor practices. There was a statistical significance association in experience from 2 – 3 years with practice (AOR= 0.015; 95%CI (0.002-0.11; P= 0.000). Majority of the nurses 52.1% had poor decision making. There was no statistical significance association in demographic data with decision making P value > 0.05.

Conclusion: Even if the majority of the participants scored highly in their attitudes, they scored poorly in practices and decision making when identifying and managing these patients.

Recommendations: Clinical supervision and educational input will improve the quality of vital signs for the care of critically ill patients in general wards.

Key words: *Vital signs recording, practices, critically ill patients, adverse events, general wards, decision making, attitudes, and modified early warning score.*

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ABBREVIATIONS

AVPU: Active, Verbal, Pain, Unresponsive

BP: Blood pressure

CI: Confidence interval

CVI: Content validity index

EWS: Early warning scoring

GCS: Glasgow Coma Scale

ICU: Intensive care unit

MET: Medical emergency team

MEWS: Modified early warning score

MNH: Muhimbili national hospital

OR: Odds ratio

SAE: Serious adverse event

TTS: Track and trigger systems

UK: United Kingdom

USA: United States of America

ViEWS: Vital PAC Early Warning Score

CONCEPTUAL DEFINITIONS

Appropriate response:

Means interpretation of nurses' self-reported actions call-out algorithm on the Tanzania modified early warning scoring (MEWS) observations chart (Kohi, Obogo and Mselle, 2016).

Clinical decision-making:

Is a complex process involving observation, information processing, critical thinking, evaluating evidence, applying relevant knowledge, problem solving skills, reflection and clinical judgment to select the best course of action which optimizes a patient's health and minimizes any potential harm (Muntean, 2012).

Critically ill patients

Are those patients with life threatening conditions which need close monitoring in a special ward with advanced equipment and machines (Chikani *et al.*, 2018).

Critical thinking:

The American Philosophical Association defines critical thinking as purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, inference, and explanation of the evidential, conceptual, methodological and contextual considerations on which judgment is based (Lee, 2014).

Deteriorating patient

Is a patient who moves from one clinical state to a worse clinical state which increases their individual risk of morbidity, including organ dysfunction, extended hospital stay, disability or death (Odell, Victor and Oliver, 2009).

General ward

Unit of the hospital where all services for medical or surgical care as well as physical, social and psychological care is made available to make the patients feel at home during their stay in the hospital from the moment of admission till they are discharged. (Ludikhuize *et al.*, 2012)

Modified early warning scoring (MEWS):

This is a simple, physiological score that may allow improvement in the quality and safety of management provided to surgical and medical ward patients (Downey *et al.*, 2018). The primary purpose is to prevent delay in intervention or transfer of critically ill patient.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background:

Nurses' traditional roles involve the recording of vital signs. Vital signs recording is a systematic data collection process that helps in monitoring a patient's condition (Elliott and Coventry, 2012). They include; blood pressure, temperature, respiratory rate, heart rate, oxygen saturation, urine output, and conscious level (Ahmed, 2017). The recording of vital signs is an important indicator of the body's physiological status, reflecting its response to physical, environmental, and psychological stressors (Stevenson, Israelsson and Bath, 2016). Evidence from quantitative studies indicates that vital signs abnormalities occur in patients several hours preceding deterioration (Vincent, 2019)., and must be assessed consistently, timely, and accurately documented (Gao *et al.*, 2005). These parameters should be the maximum dependable information in a patient's chart (Leonard and Kyriacos, 2015). However, many studies underlined that vital signs are not frequently measured, documented or interpreted in general wards (Graan, Scrooby and Bruin, 2020).

Failure to recognize and respond to patient abnormal vital signs has led to an increased risk of adverse events (AEs) in general ward patients (Massey, Chaboyer and Anderson, 2017). Globally, over 200,000 adults suffer cardiac arrests and the prevalence of abnormal vital signs is 59.4% and 13.4% had at least one severely abnormal vital sign (Andersen *et al.*, 2017). In African countries, its prevalence and mortality remains high. Tanzania is a middle income country in East Africa with a population of 57 million. The mortality rate of patients with abnormal vital signs estimated to be 68% and approximately one third (34%) included recorded abnormal vital signs (Lodge *et al.*, 2020).

Such upsetting result was repetitively resounded in many studies that discovered the delay in detecting and responding to patients' abnormal vital signs in general wards. Adverse events (AEs) such as cardiac arrests, and emergency intensive care admissions extremely affect patient well-being and quality of care in general wards (Rafter *et al.*, 2017).

However, it is necessary to appreciate how nurses understand the practice of recording, interpreting and reporting vital signs within the wider perspective of clinical decision-making in nursing (Graan, Scrooby and Bruin, 2020). The nurses use modified early warning score (MEWS) rating scale in order to determine the immediate intervention that should be given to the patient so as to prevent adverse events (Kruisselbrink *et al.*, 2016). Nurses can assess whether patients' health is improving or deteriorating by continually monitoring their vital signs (Graan, Scrooby and Bruin, 2020), which are objective measures of homeostasis. However, there is association in knowledge levels and failure in decision making to patients with the most abnormal vital sign (Redfern *et al.*, 2019).

Unfortunately, vital signs of patients are always taken by students or health care assistants during the night (Wang and Liaw, 2015). Literatures show that nurses are not timely calling for help until clinical abnormal vital signs of MEWS of 3 develops resulting in to cardiac arrest, death and unplanned admission to an intensive care unit (Recio and Griffiths, 2017). While this is the case in the ideal of Tanzanian context very little is known about the vital signs recording practice to critically ill patients in general wards. Furthermore, limited studies have been found describing the vital signs recording. Such studies are important to identify gaps that need to be considered in the on-going strategic plan to improve the quality of critical care given to patients in the country when admitted in general wards.

1.2 Problem statement

Vital signs recording to critically ill patients in general wards remain a significant concern in high, middle, and low-income countries. Generally, the recordings of vital signs reported to be mostly incomplete (Hvarfner *et al.*, 2020). Warning signs that the condition of patients is deteriorating on the ward are often unnoticed, mistreated or poorly managed (Odell, 2014). In Tanzania the recording of patients' vital signs on general wards is considered a routine nursing practice, and often delegated to health care assistants (Lilian T and Halima, 2018). In Muhimbili national hospital admission of critically ill patients from general wards to ICU account for 20% of all admissions while the majority of patients are admitted for respiratory failure with 88% requiring oxygen therapy, 75% are intubated and

51% required mechanical ventilation (Engdahl *et al.*, 2019) and these interventions increase government costs.

Despite their importance in communicating deterioration, the act of vital signs recording by nurses seems to have broken into a routine task, and often delegated to health care assistants (Lilian T & Halima, 2018). Serious concerns on incomplete and poorly vital signs recording on general wards leading to delayed detection of deterioration have been raised (Wang & Liaw, 2015).

Currently there are inadequate studies addressing nurses' failure to assess the vital signs recording practices. Therefore, the aim of this paper was to assess the vital signs recording attitudes, practices and decision making for the care of critically ill patients in general wards at Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania.

1.3 Rationale

This study will contribute new knowledge in the field of nursing and patient safety. The purpose is to reflectively learn and understand from experiences on how nurses assess, diagnose, plan and implement care focusing vital signs recordings requirement; the current practices regarding vital signs monitoring and recording to critically ill patients and perceived challenges that hinders nurses from effectively identifying patients' abnormal vital signs. Such understanding is expected to provide insight of what support and learning requirements these nurses need and how the nursing care delivery system should be modified and designed to ensure that nurses recognize abnormal vital signs effectively. This would lead to provision of nurses' in-services updating training on vital signs recording, redesigning policies and protocol of vital signs of critically ill patients as well as improving organisation systems that ensure proper decision making for critically ill patients. The outcomes of all these intervention will be raising nurse's competence on close observation in caring critically ill patients and hence better outcomes.

Furthermore, the study is expected to provide insights of areas for emphasis on vital signs recording practice of critically ill patients which can be well covered during nursing training program at degree or masters level. Likewise the findings from this study are anticipated to be used in giving evidence based advice toward improvement of some of the nursing practices with regards to vital signs recordings for critically ill patients for the

purpose of improving patient care. The study is likewise a partial fulfilment for the degree of Masters of Science in Critical Care and Trauma Nursing.

1.4 Objectives

The general objective of this study was to assess the vital signs recording attitudes, practices and decision making when caring critically ill patients in general wards at Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania.

The specific objectives were the following:-

1. To determine nurses' attitudes regarding the usefulness of vital signs in their nursing care.
2. To assess nurses' practices in recording vital signs timely, consistently, and accurately.
3. To examine nurses' decision making on identification of early signs of deterioration.

1.5 Research questions

The overall research question was:

What are the vital signs recording attitudes, practices and decision making when caring critically ill patients in general wards at Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania?

Specific research questions were the following:-

1. What are nurses' attitudes regarding the usefulness of vital signs in their nursing care?
2. What are nurses' practices in recording vital signs timely, consistently, and accurately?
3. What are nurses' decisions making on identification of early signs of deterioration?

1.6 Conceptual framework

Vital signs recording are important nursing intervention. Yet, nurses seem to be doing it as part of a routine and often overlooking their significance in detecting patient deterioration. The Nursing Role Effectiveness Model examines nurses' vital signs recording practices

and use in clinical decision making for the care of critically ill patients in general wards based on specific relationships between structure, process and outcome variables (Camargo *et al.*, 2017). Structure variables are associated with Demographic characteristics; attitudes regarding the vital signs; equipment and materials for vital signs recording which influence the processes and outcomes of vital signs recording. The process component relates to the vital signs recording. The outcome component relates to nurses' response to vital signs. Without well trained and skilled nursing personnel, patient's safety will be compromised as there may be no proper respiratory and hemodynamic monitoring of patients who may result into more adverse events. The evidences indicating that nurses are unable to recognize clinical deterioration (Figure 1)

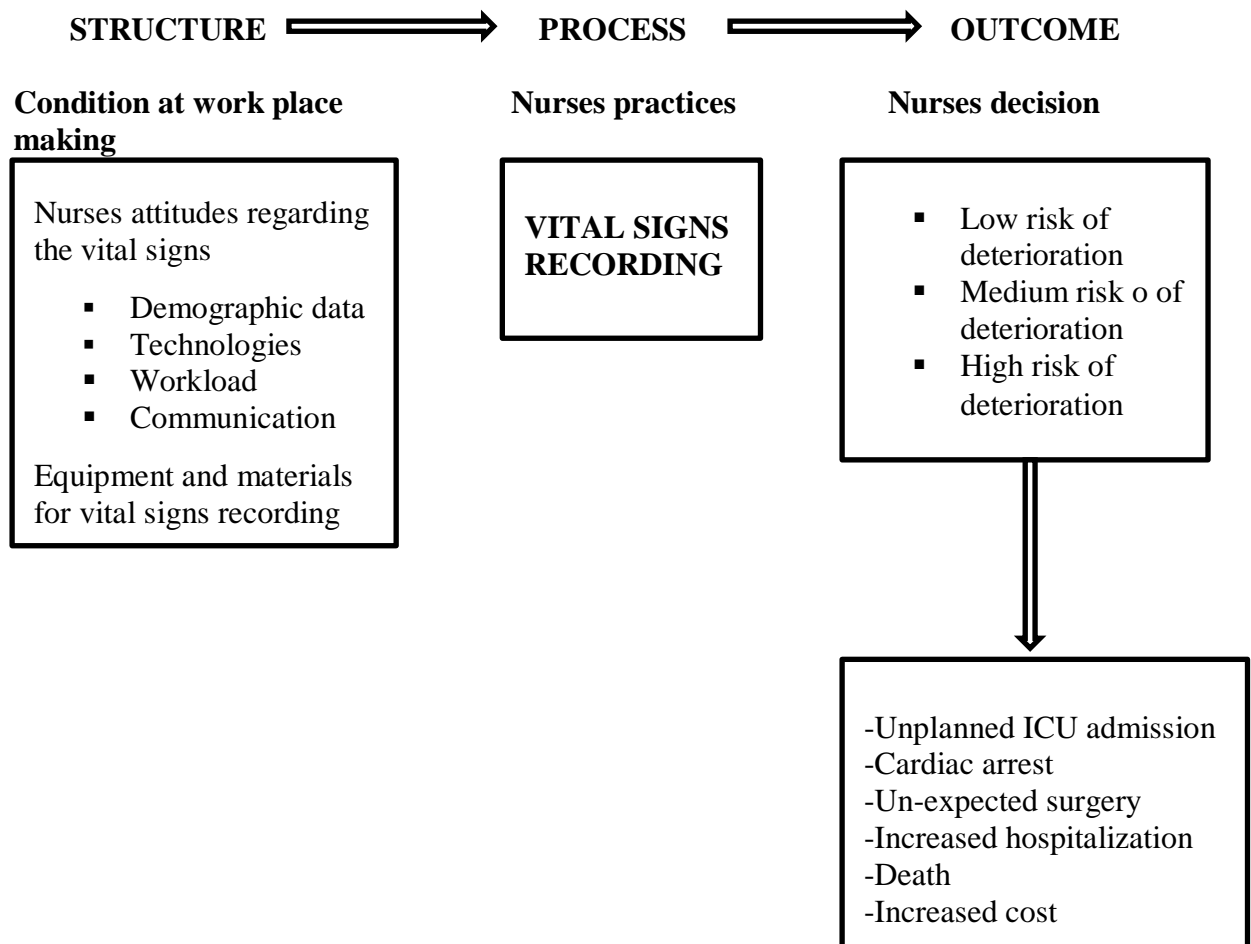


Figure 1: Modified nursing role effectiveness model describing selected components for structure, process and outcome(Camargo *et al.*, 2017).

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Theoretical Review

The Nursing Role Effectiveness Model examines nurses' vital signs recording based on specific relationships between structure, process and outcome variables (Camargo *et al.*, 2017). Some studies have shown improved competence in recognizing, responding and reporting abnormal vital signs following relevant education provision. However, the recordings of vital signs reported to be mostly incomplete (Hvarfner *et al.*, 2020). Warning signs that the condition of abnormal vital signs on the ward are often unnoticed, mistreated or poorly managed (Odell, 2014).

2.2 Structure component

This consists of condition at the workplace that influences the processes and outcomes of vital signs recording. They include Demographic characteristics, attitudes regarding the vital signs, equipment and materials for vital signs recording. Poor or lack of monitoring of observations has been attributed to over-reliance on electronic monitoring technology, specifically on pulse oximetry to measure respiratory rate (Kyriacos *et al.*, 2011).

The study done by (Redfern *et al.*, 2019) investigated the relationship between levels of nursing staffing and 'failure in decision making to patients with markedly disordered physiology. Results showed that there is association in knowledge levels and failure to respond for patients with the most abnormal vital signs. The similar study done to assess nurses with no prior knowledge of early warning score (EWS) systems and their response were recognised on knowledge gained from the rotation skills (Leonard and Kyriacos, 2015).

A study done in Uganda by (Tasew, Mariye and Teklay, 2019) on documentation. It revealed that, 11-15 years nursing experience, showed a positive alteration in their pre to post-test scores. Although statistical association between the demographic characteristics and scores on knowledge was identified, no relationships were found to be statistically significant.

General practitioner nurses' acknowledgment of and responds to patient deterioration may be unreliable and lead to unpleasant events, like prolonged admissions, unanticipated transfer to intensive care, and raised up illnesses and death (Jensen, 2019). Moreover, (Wang and Liaw, 2015) on their study noted that, three structural mechanisms, including workload, technology and observational chart designs that distressed the nursing practice of vital signs monitoring and recording. Due to the overwork with the heavy job, nurses distressing the quality of vital signs assessment. However, there are no studies that explore nurses' attitudes regarding vital signs. This demands conducting this study to fill the gap in this context.

2.3 Process component

This is focused the nurses' practices in vital signs recording timely, consistently and accurately. The study done by (Kyriacos *et al.*, 2014) describe the current practice in measurement and documentation of vital signs to identify deteriorating patients on general wards. The findings show that recordings of vital signs were mostly incomplete. Likewise, (Prgomet *et al.*, 2016) In their study identify strategies to improve intermittent or continuous vital signs monitoring in general wards; and their effectiveness in preventing adverse events on general wards of 203,407 patients across 13 countries. Findings revealed vital signs recording led to early recognition of patient deterioration, increased rapid decision making, and improvements in the suitability of vital signs documentation and death prevention.

The value of vital signs recordings in an acute care trauma setting and used the MEWS as the data gathering tool to determine the impact of the documentation on the detection of physiological derangements hence, clinical decision making at a regional hospital in South Africa (Keene *et al.*, 2017). Findings show that there was poor quality of vital sign recording practice which led to the underestimation of patients' clinical deterioration and failure to detect deteriorating patients. However, little is known and research studies are limited on nurses' practice on vital signs recording in limited-resource settings in developing countries particularly in Tanzania. Therefore, this study is aimed at filling this research gap.

2.4 Outcome component

The outcome component consists of nurses' decision making on identification of early signs of deterioration. Changes in vital signs are important to the recognition of deteriorating patients as they help nurses to confirm or quantify their suspicions of deterioration. Evidence from quantitative studies indicates that vital signs abnormalities occur in patients several hours preceding deterioration (Vincent, 2019).

Patients who experience serious adverse events during hospitalization often exhibit signs of clinical deterioration hours before the recognized events.

Moreover, a study done on Detection and management of the deteriorating ward patient (Odell, 2014). They found that, there are inaccuracies in identification of modified early warning scoring. Vital signs will not do to give timely warnings during all hours of the day (Skyttberg *et al.*, 2017). It was seen that, there is underestimation of physiological instabilities and the inability to detect worsening patients (Keene *et al.*, 2017).

A study done on Identification of deteriorating patients on general wards A retrospective observational study of medical and surgical patients from 2007 with a severe adverse event including cardiopulmonary arrest, unplanned intensive care unit admission, emergency surgery, or unexpected death was performed (Ludikhuize *et al.*, 2012). The finding revealed that 81% of the patients had a MEWS value of 3 at least once during the 48 hours before their event. Future research should focus on methods to improve the measurement and documentation of vital signs in patients at risk for deterioration.

The study on observations and warning signs prior to cardiac arrest (Emergency, Services and Hospital, 2005) the finding narrated that the cardiac arrest patients on the wards of the four Finnish hospitals of different types showed evidence of deterioration long before their cardiac arrest. Fifty-four per cent of the ward patients suffering a cardiac arrest had abnormal vital signs in the preceding 24 h. The practice of vital sign observation by the nursing staff should be improved. The study on Testing effectiveness of the revised Cape Town modified early warning systems (Kyriacos, Burger and Jordan, 2019) reported that there is a delayed of nurses recognition of deterioration of patients on general wards.

To sum up, based on the literature search and review, it shows that there was the importance of nurses especially in general wards to undergo training on vital signs recording and clinical decision making, because more studies highlighted that nurses rely more on traditional way of vital signs monitoring instead of using the proper modified early warning scale tool. But also it shows that use of technology and workload in wards are the challenges to vital signs monitoring. In Africa, especially in Tanzania still, we did not found studies that have been conducted on assessing the nurses' attitude, practice and decision making for the care of critically ill patients in general wards. Therefore this shows that this study was more important and necessary to be conducted in order to save the life of vulnerable patients with abnormal vital signs in general wards.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Design

The study was cross-sectional descriptive design, employing a quantitative approach as the information was collected and described individually once at a time. This method was selected to allow accurate collection of information that was required for this research project. The study focused on assessing of vital signs recording practices and use in clinical decision making for the care of critically ill patients in general wards.

3.2 Setting

This study was conducted at Muhimbili National Hospital (MNH). It is located in Dar es Salaam, Ilala district Upanga ward. MNH is a National Referral Hospital with 1,500 bed capacities, attending 1,000 to 1,200 outpatients per week, admitting 1,000 to 1,200 inpatients per week. The clinical area was selected as it provided a wide range of patients receiving acute clinical care who would require monitoring of vital signs. The study involved the general wards including medical, surgical and private wards.

3.3 Population

The study population in this study were enrolled and registered nurses who are working in surgical and medical wards. The total number of trained nurses in general wards at Muhimbili National Hospital is 600. Enrolled nurses are the one with certificates, and registered nurses are those with diploma, advance diploma or degree and masters in nursing. The study targeted nurses who work in those departments because most of the patients admitted are at greater risk of developing deterioration and require urgent responses. Nurses working in these departments are the key players in providing care for these patients; hence their practice on vital signs recording was assessed to advance an awareness for areas that needs improvement.

3.4 Sample size estimation

The sample size for the study was calculated using Yamane et al 1967 formula, which provides a simplified formula, in a 95% confidence level and precision, $P = 0.05$

- Given by $n = \frac{N}{1 + N(e)^2}$

- Where n = sample size
- N = The population size

Total general ward nurses from MNH at the time of data collection = (600) who are working in medical and surgical wards.

e = Level of precision ($P = 0.05$)

$$\text{Thus: } n = \frac{600}{1+600(0.05)^2} = 240$$

Therefore, the sample size was 240 nurses.

4.5 Sampling procedure

In this study participants were selected conveniently with a non-probability sampling technique. Participants were selected based on characteristics of a population and the objective of the study, which was to assess the vital signs recording practices and use in decision making for the care of critically ill patients in general wards at MNH in Dar es Salaam. All nurses caring critically ill patients in general wards were selected. The selected participants were asked for their participation in the study and signed a consent form if they agreed. The wards were also checked to ensure they had the appropriate and required equipment and materials.

3.6 Variables

3.6.1 Independent variables

- *Structure*: Condition at the work place including; Social demographic characteristics; attitudes regarding the vital signs; equipment and materials for vital signs recording.

3.6.2 Dependent variables

- *Process*: Practice of nurses such as; nurses' practices in recording vital signs timely, consistently, and accurately.

- *Outcome*: Nurses' decision making on identification of early signs of deterioration with focus on the seven parameters.

3.7 Inclusion criteria

Enrolled and registered nurses who work in surgical and medical wards and who provide direct care to the critically ill patients and who work for more than six months in the selected hospital were included in the study.

3.8 Exclusion criteria

Nurses who are involved with administration issues and who are not providing direct care to the patients were excluded from the study.

3.9 Data collection

Data were collected using structured questionnaire (Appendix 1). Checklist of required essential equipment and materials were also used and filled by researcher (Appendix 2). The questionnaires were in English version. Both tools were developed by the researcher herself through literature review. The vital signs recorded in the patient charts were heart rate HR (measured manually), respiratory rate RR (measured manually), systolic blood pressure SBP (measured with an automated blood pressure cuff), temperature (measured with a reusable thermometer) and level of consciousness alert, voice, pain and unresponsiveness (AVPU) or GCS measured manually. Also, the documents for the patients records were observed to collect data on documentation of care/monitoring provided during hospitalization.

3.10 Data collection method

This study was obtained an ethical clearance from Muhimbili University of Health and Allied Sciences (MUHAS) at the Directorate of Research and Publications prior to the commencement of the study. Permission to conduct the study at MNH was obtained from hospital administration. All participants accepted to participate in the study signed the written informed consent; the self-administered questionnaire was used to collect data from qualified participants. The principle investigator facilitated the whole process of data collection in order to reduce contradictions. The questionnaires were disseminated to the participants at their general wards during working shifts. The identification number was used instead of participant names in order to maintain confidentiality. In addition the hardcopies of the questionnaire used for data collection were safely secured in a locked cabinet. Also the data collected were stored and retrieved from SPSS for analysis and the computer was locked with password to avoid unauthorized people to access the data.

3.10.1 Data collection tool

The questionnaire comprised of socio- demographic data, then questions testing nurses decision making Adapted from (Maria and Lnrmar, 2014). Data collection took place during May 2021. Revise

3.10.2 Train of research assistant

2 days training diploma nurses was conducted purpose of the study, objectives, safe guard respondent confidentiality in how to use research tool to ensure successful submission of questionnaire to the subject. Revise

3.10.3 Pretest of the tool

A pre-tested self-administered questionnaire was used to collect information regarding attitudes, practices, and decision making. The questionnaire comprised of socio-demographic data, then questions testing attitudes and practices regarding vital signs. The questionnaire also investigated the nurses decision making on identification of early signs of deterioration.. Data collection took place during May 2021.

3.10 Data Quality Control

3.10. 1. Validity

Content and face validity of the tools used in this study were assessed by two experts who were experienced nurses with critical care specialty. They checked if tools had content that covered objectives, literature and whether questions were clear. Modification of the tool or questions was done afterward. During data analysis, the researcher controlled confounders by using multivariate analysis models in order to ensure accurate association between independent and dependent variables. The researcher trained assistant researchers to make them familiar to the tools of data collection.

3.10.2 Reliability

Reliability of the tool is the consistency with which it measures the targeted characteristic. The researcher ensured the internal reliability of the data collection tool by the use of a standardized questionnaire with a Cronbach's α test of 0.7+ to measure reliability of ten items to vital signs recording practice, seven items on decision making and eight items in attitudes found in the questionnaire. Likewise, to ensure the interrater reliability, the researcher used same trained assistant researchers throughout the study.

Also, during data collection, the principal researcher conducted a close supervision to assistant researchers to ensure that they collect the information required from the subjects throughout the study. The questionnaire was prepared with closed ended questions in order

to avoid different ways of responding to the questions from the subjects. The language used in the questionnaire was simple and not ambiguous to avoid confusions in the meaning of the concepts in the questionnaire. To establish if participants in this study would be able to understand the instructions, the items and respond correctly, the first 10 subjects was used as a pilot sample. Approximate time to fill the questionnaire was between 25 to 30 minutes.

3.6.3 Measurement of variables

Independent variables:

Structure

Social demographic data: The variables were measured by nominal scale, and categorical (ordinal) as appropriate.

Attitudes: Attitudes were assessed via a Likert scale, with item scores ranging from strongly agree (6) to strongly disagree (1) which had a potential score of 48. The scores greater or equal to the mean were categorized as positive and negative for scores below the mean.

Dependent variables:

Process

Practices of study subjects measured using 10 multiple - choice items. A value of 3, 2, 1 and zero was scored for “always”, “sometimes”, “rarely” and “never” options respectively. For questions in which there were multiple correct and incorrect responses, the scoring system used the proportion of correct responses which had a potential score of 15. Good practice for those respondents who scored above or equal to the mean score of practice questions

Outcome

Nurses' decision making on identification of early signs of deterioration; participants' decision making were assessed via a modified early warning score scale (MEWS), with item scores ranging from MEWS 1 (2) to MEWS 3 (1) which had a potential score of 14. The scores greater or equal to the mean were categorized as good and poor for scores below the mean.

3.11. Data analysis

Data were cleaned and coded, fed into computer database and checked for normality by using skewness and kurtosis before the analysis. Data analysis was done by computer software which is Statistical Package for Social Sciences (SPSS) version 23 and presented in tables and graphs. Univariate data were analysed using descriptive statistics while Bivariate and multivariate were analyzed using logistic regression models to determine the association between, practice, decision making, attitudes and vital signs recording. A confidence interval of 95% with the margin of error 5% (0.05) was used as a statistical measure of significance ($p < 0.05$).

3.12. Ethical issues

This study was obtained an ethical clearance from Muhimbili University of Health and Allied Sciences (MUHAS) at the Directorate of Research and Publications (Appendix 5) prior to the commencement of the study. Permission to conduct the study at MNH was obtained from hospital administration (Appendix 7). Furthermore, a written consent was required from the participant before engaging to the study (Appendix 4). Confidentiality was obtained by privacy. No names were used to identify participants, only number was used for identification.

All rights of the participants such as right to withdraw from the study at any time and this did not involve penalty or losing their benefits like entitlements, promotions and workshops was informed. Furthermore, the data was kept in a secured area or system with no access to un-authorized person. All study data, were kept in locked metal file cabinets in the researcher's office to be destroyed after a reasonable period of time. The right of the participant's or withdrawal from the study was respected. Also, details and information obtained was kept confidential.

CHAPTER FOUR

4:0 RESULTS

This chapter presents the results of the study. Thus, the results are present according to the objectives of the study. Structure variables are associated with Demographic characteristics; attitudes regarding the vital signs; equipment and materials for vital signs recording which influence the processes and outcomes of vital signs recording. The process component relates to the nurses practices on vital signs recording. The outcome component relates to nurses' decision making on identification of early signs of deterioration. The results are presented in the sections below;

4:1 Structure

Condition at the work place includes; Social demographic characteristics, attitudes regarding the vital signs, equipment and materials for vital signs recording.

4:1:1 Social demographic characteristics

A total of 240 participants completed the questionnaires. In order to analyze the data, participants were categorized into the following: age group; gender; qualifications; experience at the current ward; and working ward. The findings of the present study showed most of age 86 (35.8%) were between the ages of 40-49 years. Also the study findings revealed that majority in gender are female 123(51.3%). Moreover, the study also showed most of qualifications have degree in nursing 115(47.9%). Furthermore, the findings indicated that most in experience 115(47.9%) is between 4-6 years. Finally, majority of the nurses 134 (55.8%) worked in medical wards.

Table 1: Frequency and percentages by demographic categories (n 240)

Demographic categories	Frequency(n)	Percent (%)
Age		
20-29	64	26.7%
30-39	85	35.4%
40-49	86	35.8%
50-59	5	2.1%
Gender		
Female	123	51.3%
Male	117	48.7%
Qualification		
Certificate	27	11.3%
Diploma	93	38.7%
BScN	115	47.9%
Msc	5	2.1%
Experience		
6m-1yr	38	15.8%
2-3yrs	88	36.7
4-6yrs	34	14.2%
7yrs and above	80	33.3%
Ward type		
Medical	134	55.8%
Surgical	106	44.2%

4.1.2 Nurses' attitudes regarding the usefulness of vital signs in their nursing care

In this study the overall attitude score of the study participants showed that above half of respondents (54.2%) had positive attitude.

Technology

Majority of the respondents (81.1%) agreed that 'Respiratory rate value is usually estimated for stable patients during routine vital signs monitoring'. The majority (82.1%) of the respondents agreed the statement 'The use of pulse oximetry to monitor SpO₂ will reduce the need to count respiratory rates'. Majority of the respondents (71.7%) agreed with the statement 'I usually record respiratory rate as standard rate between 12–20 and min if SpO₂ is within normal range'.

Communication

The majority of the nurses responded positively to the statements contained in the subscale. More than three-quarter (83.8%) were 'Confident to report deteriorating vital signs in a

way that will get a team to review the patient. Most of respondents (67.5%) also agreed with the statement ‘I will repeatedly inform the team if no action is acted on.

Workload

The majority of respondents (82.1%) agreed with the statement ‘It is time consuming to monitor and record vital signs, about (71.7%) of respondents agreed with the statement ‘Vital signs monitoring is a boring task’, more than half (67.5%) agreed with the statement ‘I feel overwhelmed trying to complete the different frequency of vital signs collection (i.e., 1hrly, 2hrly, 4hrly) of my patient.’

Table 2: Nurses attitudes regarding the usefulness of vital signs in their nursing care

Variables	Agree n (%)	Dis agree n (%)
RR is usually estimated (18.3%)	196 (81.7%)	44
Pulsoximeters reduce the need to count RR (17.9%)	197 (82.1%)	43
Count RR as a standard rate between 12 and 20/min (28.3%)	172 (71.7%)	68
Report deteriorating vital for a team to review the patient (16.3%)	201 (83.7%)	39
Repeatedly inform the team if no action is acted on (32.5%)	167 (67.5%)	78
It is time consuming to monitor and record vital signs (17.9%)	197 (82.1%)	43
Vital signs recording are a boring task (28.3%)	172 (71.7%)	68

4.1.2.1 Relationship of Participants' Characteristics and Attitude

Feel overwhelmed 162 (67.5%) 78 (32.5%)

Cross tabulation analysis (see Table 4) identified the relationship between demographic characteristics and participants' attitude regarding vital signs recording. Although the statistical association was established, experience and ward type was found to be statistically significant (chi-square 25.169 P-value 0.000).

Table: 3. Relationship of Participants' Characteristics and Attitude

	Negative attitude %	Positive attitude %	P-value
Age			
20-29	28(43.8%)	36(56.2%)	0.454
30-39	37(43.5 %)	48(56.5%)	
40-49	44(51.2%)	42(48.8%)	
50-59	1(20%)	4(80%)	
Gender			
Female	59(48%)	64(52%)	0.496
Male	51(43.6%)	66(56.4%)	
Qualification			
Certificate	10(37%)	17(63%)	0.416
Diploma	42(45.2%)	51(54.8%)	
Degree	57(49.6%)	58(50.4%)	
Masters	1(20%)	4(80%)	
Experience of the nurses			
6m-1yr	13(34.2%)	25(65.8%)	0.001
2-3yrs	55(62.5%)	33(37.5%)	
4-6yrs	12(35.3%)	22(64.7%)	
7yrs and above	30(37.5%)	50(62.5%)	
Ward type			
Medical	36(26.9%)	98(73.1%)	0.000
Surgical	74(69.8%)	32(30.2%)	

4.1.3 Association between socio-demographic data and attitudes

After controlling confounders experience and ward type was found to be predictors of attitudes where experience from 2 to 3 years (AOR: 16.759 95%: (5.715- 49.147; p value =0.000). Medical ward predict with (AOR: 0.038 CI 95%: (0.014-0.100); p value =0.000).

Table 3: Association between socio-demographic data and attitudes

Variables	OR	95%CI	P-value	AOR	95%CI	P-value
Experience						
6month- 1yr	1.154	(0.514- 2.590)	0.729	1.181	(0.428-3.261)	0.748
2-3yrs	0.360	(0.193-0.673)	0.001	16.759	(5.715-49.147)	0.000
4-6yrs	1.100	(0.477-2.539)	0.823	1.022	(0.366-2.851)	0.967
7yrs and above	1			1		
Ward type						
Surgical	1			1		
Medical	0.629	(3.582-11.063)	0.000	0.038	(0.014-0.100)	0.000

Key: 1 used a reference group

4.1.4 Equipment and materials for vital signs recording in general wards

In this study, there were 30 general wards 7 medical and 23 surgical wards which received patients from different parts of Dar es Salaam region and other regions in Tanzania. Each ward was assessed once by a researcher for the presence of essential equipment and materials required. With regard to airway equipment, only five wards were found to have airway support equipment, which were Oropharyngeal airway adjunct and working suction machine, and none of the ward had nasopharyngeal airway adjunct.

However, for the breathing support equipment, all wards (30) had oxygen cylinder (with oxygen) and bag valve mask. Oxygen and nebuliser masks were present in eight (8) wards respectively. Intubation set was present in only medical wards. For equipment needed for circulation; syringes and needle were present in all wards ; intravenous catheter or lines were present in all wards; intravenous fluids; pulse oximeter; non-invasive blood pressure

machine were present in all wards but in bad shape; and only some medical wards had cardiac monitors.

With regards to minimum drugs for resuscitation: anaphylaxis and hypoglycaemia agents were present in all wards; all wards had drugs for convulsions, pain, and sedation; drugs for cardiac arrest and emergency hypertension/hypotension were present in all wards; and neither ward had drug for cardiac dysrhythmia. Other supportive materials such as gloves were present in all wards, antiseptic lotion/solution were present in only all wards, and all wards had checklist for drugs and expiration date or checklist for the equipment present in the wards.

Table 4: Showing the equipment and materials in general wards

ITEM	PRESENT
1. AIRWAY SUPPORT EQUIPMENTS	
- Oro pharyngeal airway	YES
- Nasopharyngeal airway	NO
- Emergency surgical airway set	NO
- Suction machine of appropriate standard and working	YES
2. BREATHING SUPPORT EQUIPMENTS	
- Oxygen mask	YES
- Nebulizer mask	YES
- Bag valve mask (BVM)	NO
- Intubation set with appropriate size blades	NO
- Endotracheal tubes	NO
- Oxygen supply/Oxygen cylinder with oxygen	YES
3. CIRCULATORY SUPPORT EQUIPMENTS	
- Pulse ox meter	NO
- Non-invasive BP device with appropriate sized cuffs	YES
- Intravenous Catheter (peripheral)	YES
- Syringes and needles	YES
- Intravenous fluids	YES
- A sharp disposal container	YES
4. DRUGS FOR RESUSCITATION	
- Cardiac arrest	NO
- Hypotension and Hypertension	YES
- Cardiac dysrhythmia	NO
- Anaphylaxis	YES
- Hypoglycemia and Hyperglycemia	YES
- Convulsions	YES
- Pain	YES
- Sedation and Neuromuscular paralysis	YES

5. OTHER SUPPORT EQUIPMENTS AND PERSONEL

- Nasogastric tube and bag	YES
- Urinary catheter and bag	YES
- Antiseptic lotions	YES
- Gloves	YES
- Checklist for drugs and expire date	YES
- Checklist for equipment's	YES

4.2 Process

The process component relates nurses' practices in recording vital signs

4:2.1 Nurses' practices in recording vital signs timely, consistently, and accurately.

The findings showed (52.5%) of the study subjects scored below the mean. Moreover, on timely vital signs recording (14.2%) of nurses are always recording vital signs to general ward patients and (36.7%) are sometimes recording vital signs to general ward patients whereas (14.2%) recording vital signs to critically ill patients after 15minutes, (35.8%) after 30minutes and (20%) after 1 hour. Concerning the accuracy of vital signs recording (38.3%) reporting errors on facts only and (50%) they don't know reporting errors. Regarding the consistency, most of the respondents (69.2%) accepted the use of standardized vital signs equipment (Table: 2).

Table 5: Nurses' practices in recording vital signs.

VARIABLES	FREQUENCY	PERCENTAGE
Nurses take and record vital signs for every patient		
Yes	235	97.9%
No	5	2.1%
Time for recording vital signs to general ward patients		
Always	34	14.2%
Sometimes	88	36.7%
Rarely	37	15.4%
Never	81	33.8%
Time for recording vital signs to critically ill patients		
After every 15 minutes	34	14.2%
After every 30 minutes	86	35.8%
After every 1hour	48	20%
After every 4 hours	72	30%
Reporting medical errors		
Yes	178	74.2%
No	62	25.8%
Way of error recording		
No words like" error" or "mistake"	27	11.3%
Facts only	92	38.3%
I don't know	121	50.4%
Read colleague's notes		
Yes	142	59.2%
No	98	40.8%
Colleague's notes fulfil standard		
Yes	142	59.2%
No	98	40.8%
Reporting vital signs after every measurements		
Yes	178	74.2%
No	62	25.8%
Use standardized vital signs equipment		
Yes	166	69.2%
No	74	30.8 %
Documents patient response to care		
Yes	223	92.9%
No	17	7.1%

4:2:2 Factors affecting nurses' practices in recording vital signs.

After adjustment of confounders; it showed there is an association between practices and experience from 2 – 3 years (AOR= 0.015; 95% CI: 0.002-0.114; P= 0.000) as well as from 4-6years (AOR= 0.006; 95% CI: 0.001-0.049; P = 0.000).

Table 6: Association between socio-demographic data, attitudes and practice

Variables	Nurses' practices		COR 95% CI; P-Value	AOR 95% CI; P-Value
	Good n (%)	Poor n (%)		
Age				
20-29	23(35.9)	41(64.1)	2.04(0.18-38.56);0.64	0.49(0.03-9.30);0.63
30-39	28 (32.9)	57(67.1)	5.49(0.23-130.79);0.30	0.18(0.08-4.34);0.29
40-49	15 (17.4)	71 (82.6)	5.49(0.23-130.79);0.30	2.23(0.13-35.9);0.57
50-59	1 (20)	4(80)	1	1
Gender				
Female	34 (27.6)	89 (72.4)	0.66(0.29-1.50);0.32	1.52(0.67-3.46);0.31
Male	33(28.2)	84 (71.8)	1	1
Qualification				
Certificate	8(29.6)	19(70.4)	2.50(0.44-14.37);0.30	0.40(0.70-2.29);0.304
Diploma	31(33.3)	62(66.7)	0.51(0.11- 2.32);0.40	01.98(0.43- 9.09);0.38
BScN	27(23.5)	88(76.5)	1	1
Msc	1(20)	4(80)	-	-
Experiences				
6m-1yr	3(7.9)	35(92.1)	10.14(1.00- 15.60-); 0.05	0.09(1.01- 1.03); 0.053
2-3yrs	40(45.5)	48(54.5)	41.39(7.12-47.79); 0.000	0.01(0.001-0.06); 0.000
4-6yrs	23(67.6)	11(32.4)	45.59(23.40-97.09);0.000	0.002(0.00-0.02); 0.000
7yrs and above	1(1.2)	79(98.8)	1	1
Ward type				
Medical	130(91.5)	21(11.5)	1.36(0.76-2.41);0.29	1.55(0.66-3.69);0.32
Surgical	84(85.7)	5(8.8)	1	1
RR is usually estimated				
Agree	16(34)	31(66)	0.65(0.26-1.62);0.360	1.53(0.62-3.79);0.36
Disagree	73(37.8)	120(62.2)	1	1
Pulsoximeters reduce the need				
Agree	16(37.2)	27(62.8)	1.03(0.38-2.76);0.950	0.97(0.36-2.59);0.95
Disagree	73(37.1)	124(62.9)	1	1
Count RR as a standard rate				
Agree	29(43.3)	38(56.7)	1.67(0.84-3.33);0.142	0.59-(0.30-1.19);0.14
Disagree	60(34.7)	113(65.3)	1	1
Report deteriorating				
Agree	15(38.5)	24(61.5)	0.94(0.41-2.17);0.88	1.07(0.46-2.47);0.88
Disagree	74(36.8)	127(63.2)	1	1

Key:* 1 was used as a reference group

4.3 Outcome

The outcome component related to nurses response to vital signs where decision making based on vital signs includes impacts of decisions on patients with focus on seven parameters.

4.3.1 Nurses' decision making on identification of early signs of deterioration

Decision making on identification of early signs of deterioration among study participants was generally poor. Of the 240 nurses, 125 (52.1 %) scored below the mean, answering medium and high risk of deterioration MEWS 2 and 3. The mean score was 3.8 (SD: 3.4).

Respondents' (n=240) selections of low ranges of values

The responses at a low risk of deterioration MEWS level of 1. This relates to respiratory rate 67 (27.9%); oxygen saturation 54 (22.5%); heart rate 22 (9.2%); systolic BP 27 (11.3%); Temperature 80(33.3%); level of consciousness 28 (11.7%); 82 (34.2%) urine output (Table 8).

Table 8: Respondents' (n=240) selections of low ranges of values

Variables	Frequency	Percentage%
MEWS 1		
Respiratory rate	67	27.9%
Oxygen saturation	54	22.5%
Heart rate	22	9.2%
Systolic BP	27	11.3%
Temperature	80	33.3%
Level of consciousness	28	11.7%
Urine output	48	34.2%

Key: BP=Blood pressure; **MEWS 1**= Modified early warning score 1

Note to table: MEWS 1= low risk of deterioration

Respondents' (N=240) selections of medium ranges of values

Responses at MEWS level 2. This relates to respiratory rate 10(4.2%); oxygen saturation 7(2.9%); heart rate 20(8.3%); systolic BP 31 (12.9%); Temperature 52(21.7) level of consciousness 30 (12.5%); and 48 (20%) urine output (Table 9).

Table 7: Respondents' (N=240) selections of medium ranges of values

Variables	Frequency	Percentage%
MEWS 2		
Respiratory rate	10	4.2%
Oxygen saturation	7	2.9%
Heart rate	20	8.3%
Systolic BP	31	12.9%
Temperature	52	21.7%
Level of consciousness	30	12.5%
Urine output	82	20%

Key: BP=Blood pressure; MEWS 2= Modified early warning score 2

Note to table: MEWS 2= medium risk of deterioration

Respondents' (N=240) selections of high ranges of values

Responses at MEWS level 3. This relates to respiratory rate 163(67.9); oxygen saturation 179(74.6%); heart rate 198 (82.5%); systolic BP 182(75.8%); Temperature 108(45%); level of consciousness 182 (75.8%); and urine output 110 (45.8%) urine output (Table 10).

Table 8: Respondents' (N=240) selections of high ranges of values

Variables	Frequency	Percentage%
MEWS 3		
Respiratory rate	163	67.9%
Oxygen saturation	179	74.6%
Heart rate	198	82.5%
Systolic BP	182	75.8%
Temperature	108	45%
Level of consciousness	182	75.8%
Urine output	110	45.3%

Key: BP=Blood pressure; MEWS 3= Modified early warning score 3

Note to table: MEWS 3=high risk of deterioration

4.3.2 Relationships between social demographic characteristics and decision making

Relationship between social demographic characteristics and decision making were explored using chi square test. Decision making was no significant association with demographic data Pvalue > 0.05 (Table 11)

Table 9: Relationship between social demographic characteristics and decision making

Variables	Nurses decision making		Chi square	P value
	Poor	Good		
Age				
20-29	49(76.6%)	15(23.4%)	1.972	0.578
30-39	68(80%)	17(20%)		
40-49	65(75.6%)	21(24.4%)		
50-59	5(100%)	0(0%)		
Gender				
Female	97(78.9%)	26(21.1%)	0.131	0.717
Male	90(76.9%)	22(23.1%)		
Qualification				
Certificate	17(63%)	10(37%)	5.234	0.155
Diploma	73(78.5%)	20(21.5%)		
BScN	92(80%)	23(20%)		
Msc	5(100)	0(0%)		
Experience				
6m-1yr	33(86.8%)	5(13.2%)	5.108	0.164
2-3yrs	71(80.7%)	17(19.3%)		
4-6yrs	27(79.4%)	7(20.6%)		
7yrs and above	56(70%)	24(30%)		
Ward type				
Medical	101(75.4%)	33(24.6%)	1.141	0.285
Surgical	86(81.1%)	20(18.9%)		

4:4 Submission and Dissemination of the findings

The final dissertation report from well analyzed and processed data will be disseminated to the office of Muhimbili University of Health and Allied Sciences, the MNH and Ministry of Health. In addition, the findings will be published in peer review journal. After data collection and analysis the results of the study will be disseminated to the Teaching, Research and Consultancy Coordination Unit of MNH.

The research report will be presented at the Department of nursing and used to produce a Dissertation for Master's degree award and thereafter disseminated to the Dean School of Nursing and the Director of Postgraduate Studies and manuscript for publication.

CHAPTER FIVE

5.0 DISCUSSION

We aim to assess attitudes and practices of vital signs recording as well as decision making on identification of early signs of deterioration among nurses working in general wards. Majority of participants were working in medical wards and most of them had worked from 2 to 3 years. Above half of respondents had positive attitude regarding the usefulness of vital signs. There was a statistical significance association in experience from 2 – 3 years with attitudes also, there was a statistical significance association in medical wards with attitudes Majority of the nurses had poor practices. There was a statistical significance association in experience from 2 to 3 years with practice as well as from 4-6years. More than half of the nurses had poor decision making. There was no statistical significance association in demographic characteristics with decision making.

5.1. Nurses attitude regarding vital signs recording

The current study identified using electronic vital signs monitors that affect the quality of patient assessment. Ward nurses regard pulse oximetry as a substitute for respiratory rate monitoring. This result suggests poor understanding of the importance of respiratory rate assessment. Pulse oximetry measures oxygen saturation but not ventilation, while measuring the respiratory rate reveals ventilation but not necessarily saturation levels. Therefore, the effect of technology on nurses' role in vital signs monitoring to detect deterioration needs further exploration. This finding supports previous studies Mok *et al.*, (2015) that highlighted approximately a quarter of nurses agreed that pulse oximetry can be used to substitute respiratory rate monitoring. Also, unlike critical care settings, very few studies have evaluated the use of continuous physiological monitoring in general wards.

Moreover, ward nurses are often overwhelmed with heavy workload which affects the value of vital signs assessment. The reason can be in general wards settings at MNH is many times one nurse can care for five to fifteen patients per shift. Another study done by (Wang and Liaw, 2015) pointed out that excessive heavy workload has been identified to influence the quality of vital signs monitoring. However, the evidence supporting the effect

of workload on vital signs monitoring remains uncertain. More studies can be conducted to explore the influence of workload on nurses' roles in vital signs monitoring.

5.2. Nurses' practices in recording vital signs timely, consistently, and accurately

Overall the current results demonstrate majority of the nurses had poor practices. This is due to the underestimation of physiological derangements and the inability to detect deteriorating patients. Findings presented herein agree with a study done by (Kyriacos *et al.*, 2014) which showed that, recordings of vital signs were mostly incomplete.

Moreover, (Keene *et al.*, 2017) narrated that there was poor quality of vital sign recording practice which led to the underestimation of patients' clinical deterioration and failure to detect deteriorating patients. A more current study by (Graan, Scrooby and Bruin, 2020) shows that the implementation record was not always accurately identified. Therefore, Complete and timely monitoring and recording of vital signs are important.

5.3. Nurses decision making on identification of early signs of deterioration

This study clearly shows inadequate decision making on identification of early warning score. Nurses response on MEWS 3 where the patients are at the higher risk of deterioration. This is consistent with previous research studies conducted showing that 81% of the patients had a MEWS value of 3 at least once during the 48 hours before their event (Ludikhuize *et al.*, 2012). Also, (Kyriacos, Burger and Jordan, 2019) reported that there is a delayed of nurses recognition of deterioration of patients on general wards. Therefore the researcher insisted that more continuous in-service training needs to be conducted among nurses especially education on nurses' decision making on identification of early warning score so as to reduce adverse events.

5.4 Limitation and mitigation

The information in this study was based on self-report from nurses. Therefore, there was a probability that self-report responses would create validity limitations as the respondents may often be biased especially because they were presenting their own experiences. Also the respondents would decide to report experiences that are acceptable socially instead of reporting the real situation because they were influenced by social interest. But such biases and limitations were minimized by requesting respondents to be truthful during answering

the questionnaire. The tools used in this study contained closed - ended questions; therefore this would have reduced the possibility for respondents to express their additional opinions about the issue. But the response choice clarified the questions in order to give respondents enough space to explain their thoughts. The convenient sampling was used due to limited time and not enough nurses; therefore almost all nurses available were recruited.

CHAPTER SIX

6.0 Conclusion

Although technology has allowed monitoring to be taken place using electronic vital signs monitors, it affects the quality of patient assessment. Ward nurses regard pulse oximetry as a substitute for RR monitoring. Moreover, ward nurses are often overwhelmed with heavy workload which affects the value of vital signs assessment. Subsequently, there is lack of monitoring and recording of vital signs timely, consistently, and accurately. Finally, there is lack of knowledge on identification of early warning score. In addition general ward nurses showed poor decision making on identification of abnormal vital signs especially the use of the scientific tools on MEWS scale to the patients. Nurses response on MEWS 3 where the patients are at the higher risk of deterioration. Hence this indicated that the response of general ward nurses toward abnormal vital signs was low.

6.2 Recommendations

There is the need for improved facilities for monitoring and recording of vital signs and need for standardized routines for measuring vital signs.

Recommendations for the clinical practice

The institution is recommended to facilitate evidence-based practiced research to address the decision making gap that existed on physiological compensatory mechanisms and the pathophysiology in vital signs changes to enhance nurses' clinical reasoning ability to interpret early signs of clinical deterioration.

Recommendations for the future research

More studies can be conducted to explore the impact of workload on nurses' roles in vital signs monitoring. Future research studies are needed to identify the optimal method to improve the clinical process of undertaking vital signs monitoring.

Recommendations for leadership and policy

We recommend the utilization of the mentorship system for the experienced nurses to be paired with new employed ones.

REFERENCES

- Ahmed, M. U. (2017) ‘An Intelligent Healthcare Serviceto Monitor Vital Signs in Daily Life – A Case Study on Health-IoT’, *International Journal of Engineering Research and Applications*, 07(03), pp. 43–45. doi: 10.9790/9622-0703024345.
- Andersen, L. W., Kim, W. Y., Ph, D., Chase, M., Berg, K., Mortensen, S. J., Moskowitz, A., Novack, V., Ph, D., Cocchi, M. N., & Donnino, M. W. (2017). *HHS Public Access*. 112–117. <https://doi.org/10.1016/j.resuscitation.2015.08.016>.
- Camargo, f. c. *et al.* (2017) ‘models for the implementation of evidence-based practice in hospital based nursing : a narrative review 1 modelos para la implementación de la práctica basada en evidencias en la enfermería hospitalaria : revisión’, 26(4), pp. 1–12.
- Chikani, M. C. *et al.* (2018) ‘Review of Clinico-Demographic Patterns and Profiling of the Determinants of Outcome of Neurological Surgery Admissions in an Intensive Care Unit: Preliminary Study’, *International Journal of Science and Research (IJSR)*, 7(11), pp. 1055–1059. doi: 10.21275/ART20192884.
- Downey, C. L. *et al.* (2018) ‘Patient attitudes towards remote continuous vital signs monitoring on general surgery wards: An interview study’, *International Journal of Medical Informatics*, 114, pp. 52–56. doi: 10.1016/j.ijmedinf.2018.03.014.
- Elliott, M. and Coventry, A. (2012) ‘Critical care: The eight vital signs of patient monitoring’, *British Journal of Nursing*, 21(10), pp. 621–625. doi: 10.12968/bjon.2012.21.10.621.
- Emergency, U., Services, M. and Hospital, R. U. (2005) ‘Observations and warning signs prior to cardiac arrest. Should a medical emergency team intervene earlier? ’, (May 2003), pp. 702–706. doi: 10.1111/j.1399-6576.2005.00679.x.
- Engdahl, S. *et al.* (2019) ‘Referral and admission to intensive care : A qualitative study of doctors ’ practices in a Tanzanian university hospital’, (ii), pp. 1–16. doi: 10.1371/journal.pone.0224355.
- Gao, T. *et al.* (2005) ‘Vital Signs Monitoring and Patient Tracking Over a Wireless Network’, (September).
- Graan, A. C. Van, Scrooby, B. and Bruin, Y. (2020) ‘Recording and interpretation of vital signs in a selected private hospital in the KwaZulu-Natal province of South Africa’, *International Journal of Africa Nursing Sciences*, 12(February), p. 100199. doi: 10.1016/j.ijans.2020.100199.
- Hvarfner, A. *et al.* (2020) ‘Vital Signs Directed Therapy for the Critically Ill : Improved Adherence to the Treatment Protocol Two Years after Implementation in an Intensive Care Unit in Tanzania’, 2020.
- Jensen, J. K. (2019) ‘Introducing the National Early Warning Score – A qualitative study of hospital nurses ’ perceptions and reactions’, (March), pp. 1067–1075. doi: 10.1002/nop2.291.
- Keene, C. M. *et al.* (2017) ‘The effect of the quality of vital sign recording on clinical decision making in a regional acute care trauma ward’, *Chinese Journal of Traumatology -*

English Edition, 20(5), pp. 283–287. doi: 10.1016/j.cjtee.2016.11.008.

Kohi, T. W., Obogo, M. W. and Mselle, L. T. (2016) ‘Perceived needs and level of satisfaction with care by family members of critically ill patients at Muhimbili National hospital intensive care units, Tanzania’, *BMC Nursing*, 15(1), pp. 1–7. doi: 10.1186/s12912-016-0139-5.

Kruisselbrink, R. *et al.* (2016) ‘Modified Early Warning Score (MEWS) Identifies Critical Illness among Ward Patients in a Resource Restricted Setting in Kampala , Uganda : A Prospective Observational Study’, 5, pp. 1–13. doi: 10.1371/journal.pone.0151408.

Kyriacos, U. *et al.* (2011) ‘Monitoring vital signs using early warning scoring systems : a review of the literature’, pp. 311–330. doi: 10.1111/j.1365-2834.2011.01246.x.

Kyriacos, U. *et al.* (2014) ‘Monitoring Vital Signs : Development of a Modified Early Warning Scoring (Mews) System for General Wards in a Developing Country’, 9(1). doi: 10.1371/journal.pone.0087073.

Kyriacos, U., Burger, D. and Jordan, S. (2019) ‘Testing effectiveness of the revised Cape Town modified early warning and SBAR systems : a pilot pragmatic parallel group randomised controlled trial’, pp. 1–14.

Lee, S. W. (2014) ‘Overview of nursing theory’, 12(September 2013), pp. 58–67.

Leonard, M. M. and Kyriacos, U. (2015) ‘Nurse Education Today Student nurses ’ recognition of early signs of abnormal vital sign recordings’, *YNEDT*, 35(9), pp. e11–e18. doi: 10.1016/j.nedt.2015.04.013.

Lilian T, M. and Halima, M. (2018) ‘Caring Critically Ill Patients in the General Wards in Tanzania: Experience of Nurses and Physicians’, *International Journal of Critical Care and Emergency Medicine*, 4(2). doi: 10.23937/2474-3674/1510047.

Lodge, W. *et al.* (2020) ‘Assessing completeness of patient medical records of surgical and obstetric patients in Northern Tanzania’, *Global Health Action*, 13(1). doi: 10.1080/16549716.2020.1765526.

Ludikhuizen, J. *et al.* (2012) ‘Identification of deteriorating patients on general wards; measurement of vital parameters and potential effectiveness of the Modified Early Warning Score’, *Journal of Critical Care*, 27(4), pp. 424.e7-424.e13. doi: 10.1016/j.jcrc.2012.01.003.

Maria, M. and Lnrmar, L. (2014) ‘rs ity of e To w n ve rs ity e To w’.

Massey, D., Chaboyer, W. and Anderson, V. (2017) ‘What factors influence ward nurses’ recognition of and response to patient deterioration? An integrative review of the literature’, *Nursing Open*, 4(1), pp. 6–23. doi: 10.1002/nop2.53.

Mok, W. *et al.* (2015) ‘Attitudes towards vital signs monitoring in the detection of clinical deterioration : scale development and survey of ward nurses’, 27(April), pp. 207–213. doi: 10.1093/intqhc/mzv019.

- Muntean, W. J. (2012) 'Nursing clinical decision-making : A literature review', *NCSBN Executive Summary*, pp. 1–24.
- Odell, M. (2014) 'Detection and management of the deteriorating ward patient : an evaluation of nursing practice', pp. 173–182. doi: 10.1111/jocn.12655.
- Odell, M., Victor, C. and Oliver, D. (2009) 'literature review'. doi: 10.1111/j.1365-2648.2009.05109.x.
- Prgomet, M. *et al.* (2016) 'Vital signs monitoring on general wards : clinical staff perceptions of current practices and the planned introduction of continuous monitoring technology', 28(4), pp. 515–521. doi: 10.1093/intqhc/mzw062.
- Rafter, N. *et al.* (2017) 'The Irish National Adverse Events Study (INAES): the frequency and nature of adverse events in Irish hospitals — a retrospective record review study', pp. 111–119. doi: 10.1136/bmjqs-2015-004828.
- Recio, A. and Griffiths, P. (2017) 'Factors affecting observations of vital signs in hospital during the night shift: nurses' perspectives', *RCN International Nursing Research Conference*, (April). Available at: <https://www.researchgate.net/publication/318360427>.
- Redfern, O. C. *et al.* (2019) 'The association between nurse staffing levels and the timeliness of vital signs monitoring : a retrospective observational study in the UK', pp. 1–8. doi: 10.1136/bmjopen-2019-032157.
- Skyttberg, N. *et al.* (2017) 'Exploring vital sign data quality in electronic health records with focus on emergency care warning scores', *Applied Clinical Informatics*, 8(3), pp. 880–892. doi: 10.4338/ACI-2017-05-RA-0075.
- Stevenson, J. E., Israelsson, J. and Bath, P. A. (2016) 'Recording signs of deterioration in acute patients : The documentation of vital signs within electronic health records in patients who suffered in- hospital cardiac arrest'. doi: 10.1177/1460458214530136.
- Tasew, H., Mariye, T. and Teklay, G. (2019) 'Nursing documentation practice and associated factors among nurses in public', *BMC Research Notes*, pp. 1–6. doi: 10.1186/s13104-019-4661-x.
- Vincent, J. L. (2019) 'The continuum of critical care', *Critical Care*, 23(Suppl 1), pp. 19–23. doi: 10.1186/s13054-019-2393-x.
- Wang, W. and Liaw, S. Y. (2015) 'Vital signs monitoring to detect patient deterioration: An integrative literature review', (May). doi: 10.1111/ijn.12329.

APPENDICES:**Appendix 1: Structured questionnaires (English version)**

Thank you for agreeing to participate in this study after you was given an information sheet with details of the study. Please sign two copies of the attached consent form and keep one copy which also contains the information sheet.

VITAL SIGNS RECORDINGS PRACTICE AND USE IN CLINICAL DECISION MAKING FOR CARING CRITICALLY ILL PATIENTS IN GENERAL WARDS AT MNH.

NUMBER:

--	--	--

SECTION A: DEMOGRAPHICS CHARACTERISTICS

Q1. What is your age?

20 - 29yrs	30 - 39yrs	40 - 49yrs	50 - 59yrs

Q2. Gender

Female	Male

Q3. Tick the box that applies to you: I have the following qualifications

Certificate nurse	Diploma nurse	Degree nurse	Master's degree nurse

Q4. How many years of working experience do you have at the working department?

6 months to 1yr	2 to 3yrs	4 to 6yrs	7yrs and above

Q5. What type of your working unit?

Medical	Surgical

SECTION B: NURSES PRACTICE

SNO	ITEMS
1	Nurses take and record vital signs for every patient
	Yes
	No
2	Time for recording vital signs to general ward patients
	Always
	Sometimes
	Rarely
	Never
3	Time for recording vital signs to critically ill patients
	After every 15 minutes
	After every 30 minutes
	After every 1hour
	After every 4 hours
4	Report any medical error
	Yes
	No
5	Way of error recording
	No words like" error" or "mistake"
	Facts only
	I don't know
6	Read colleague's notes
	Yes
	No
7	Colleague's notes fulfil standard
	Yes
	No
8	Reporting vital signs after every measurements
	Yes

	No
9	Use standardized vital signs equipment
	Yes
	No
10	Documents patient response to care
	Yes
	No

11. Please list the most common challenges you face when caring the patient that affect vital signs recording.

.....

SECTION C: DECISION MAKING ON IDENTIFICATION OF EARLY WARNING SCORE

1. Tick two blocks to indicate the respiratory rate readings (breaths/min) in the list below that would be of concern to you as early signs of deterioration in a patient and for which you will ask for help.

9 or less	9-14	15-20	21-29	30 or more

2 Tick the one block for SAT/SpO2 reading in the list below that would be of concern to you as an early sign of deterioration in a patient and for which you will ask for assistance.

Less than 85%	85-89%	90-92%	93+%

3. Tick two blocks to indicate the heart rate readings (beats/minute) in the list below that would be of concern to you as early signs of deterioration in a patient and for which you will ask for support.

40 or lower	41-50	51-100	111-129	130 or more

4 Tick two blocks to indicate the systolic blood pressure readings (mmHg) in the list below that would be of concern to you as early signs of deterioration in a patient and for which you will respond.

70 or lower	71-80	81-100	101-199	200 and higher

5 Tick the one block of temperature readings in the list below that would not be of concern to you in a patient and for which you will make decision:

Lower than 35°C	35-38.4°C	38.5°C or higher	39.6°C or higher

6 Tick one response in the list below that will alert you to an early sign of deterioration for which you will make decision:

Alert (A) (same as GCS 15)	Responds to voice (V) (same as GCS 14)	Responds to pain (P) Confused (same as GCS 13-9)	Unresponsive (U) (same as GCS<8)

7 Tick two blocks of values for urine output in the list below that are early signs of deterioration for which you make decision: Conscious level UNRESPONSIVE 3 54 (70.1)
Conscious level RESPONDS TO PAIN/
2 20 (26.0)

Nil	30 ml/hr. or less	Less than 60 ml/hr	60 ml/hr >300 ml/hr for 2hrs

SECTION D: ATTITUDES

Directions: Tick the box under the opinion that most closely represents your own.

Technology

- Respiratory rate is usually estimated for stable patients during routine vital signs monitoring.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

- The use of pulseoximeters to measure SPO₂ will reduce the need to count respiratory rate.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

3. I usually count respiratory rate as a standard rate between 12 and 20/min if SPO₂ is within normal range.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

Communication

1. I am confident to report deteriorating vital signs in a way that will get a team to review the patient.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

- 1 will repeatedly inform the team if no action is acted on.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

Work load

1. It is time consuming to monitor and record vital signs.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

2. Vital signs recording are a boring task.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

3. I feel overwhelmed trying to complete the frequency of vital signs collection (i.e., 1hrly, 2hrly, 4hrly) of my patients.

Strongly Disagree	Slightly disagree	Disagree	Agree	Slightly agree	Strongly agree

THANK YOU Adapted from Martha Maria Leonard MSc dissertation 2014: **Description of final year nursing students' ability to recognize abnormal vital signs recordings and clinical decision-making process.**

Appendix 2: Checklist of required equipment's and materials during vital signs recording

1. AIRWAY SUPPORT EQUIPMENTS	YES	NO	NA
- Oro pharyngeal airway			
- Nasopharyngeal airway			
- Emergency surgical airway set			
- Suction machine of appropriate standard and working			
2. BREATHING SUPPORT EQUIPMENTS	YES	NO	NA
- Oxygen mask			
- Nebulizer mask			
- Bag valve mask (BVM)			
- Intubation set with appropriate size blades			
- Endotracheal tubes			
- Oxygen supply/Oxygen cylinder with oxygen			
3. CIRCULATORY SUPPORT EQUIPMENTS	YES	NO	NA
- Pulse ox meter			
- Non-invasive BP device with appropriate sized cuffs			
- Intravenous Catheter (peripheral)			
- Syringes and needles			
- Intravenous fluids			
- A sharp disposal container			
4. DRUGS FOR RESUSCITATION	YES	NO	NA
- Cardiac arrest			
- Hypotension and Hypertension			
- Cardiac dysrhythmia			
- Anaphylaxis			
- Hypoglycemia and Hyperglycemia			
- Convulsions			
- Pain			
- Sedation and Neuromuscular paralysis			
5. OTHER SUPPORT EQUIPMENTS AND PERSONEL	YES	NO	NA
- Nasogastric tube and bag			
- Urinary catheter and bag			
- Antiseptic lotions			
- Gloves			
- Checklist for drugs and expire date			
- Checklist for equipment's			

Appendix 3: Modified early warning scoring system.

Wellington Early Warning Score Matrix

SCORE	MET	3	2	1	0	1	2	3	MET
ZONE	BLUE	RED	ORANGE	YELLOW	WHITE	YELLOW	ORANGE	RED	BLUE
Resp Rate	<5	5-8		9-11	12-20		21-24	25-35	>35
SpO ₂		≤91	92-93	94-95	≥96				
Supplemental O ₂			YES		NO				
Temp			≤35.0	35.1-36.0	36.1-38.0	38.1-39.0	≥39.1		
Sys BP	<70	70-90	91-100	101-110	111-219			≥220	
Heart Rate	<40		40-50		51-90	91-110	111-130	131-140	>140
Level of Consciousness					Alert			Voice or Pain	Unresponsive or fitting

Studies performed in the United Kingdom, China and Australia has found that the MEWS was both a valid and a reliable instrument.

Appendix 4: Consent form (English version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

**DIRECTORATE OF RESEARCH AND PUBLICATIONS
MUHAS INFORMED CONSENT FORM**

ID NO: HD/MUH/T.507/2019

Consent to participate in a study: Title: quality of vital sign recordings practice and use in the decision making for caring critically ill patients in general wards at Muhimbili national hospital

Greetings Sir/Madam

My name is HALIMA MHINA from the MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES; I conduct a study to assess the quality of vital sign recordings and use in the decision making for caring critically ill patients in general wards at MNH.

Aim of the study

The purpose of the study is to explore nurses' practices on vital signs recording and use in decision making for critically ill patient at MNH.

Participants

All nurses working in general wards.

Benefits

If you agree to join the study, you will be given a questionnaire to answer a series of questions in the guide prepared for the study.

Risks

There are no risks associated with being involved in the study. The study will provide data about early signs of patient deterioration that can be used to improve health care services for patients who are at risk for severe adverse events.

Confidentiality

All information that will be collected from you will be treated confidential and will not be used for any other purpose other than this study.

Costs

No payment will be requested from you as a fee to participate in the study

Voluntary participation and rights to withdraw

To participate in this study is completely your choice. You are free to choose either to participate in this study or not. You can decide to stop participating in this study at any time you wish even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise allowed.

Person to contact in case of questions or any clarifications regarding this research:

Halima M Mhina, 0715778085/0737999595 email: halimamhina22@gmail.com or research supervisor Dr. Menti Ndile or Mr. Joel Ambikile Muhimbili University of Health and Allied Sciences School of Nursing P.O. Box. 65004 Dar es Salaam, Mobile Number +255 784 287 062/ 255 715 822 398.

In case of any information about your rights as a participant in this study, please contact:

Dr. Bruno Sangunya

Director of Research and Publications,

Muhimbili University of Health and Allied sciences (MUHAS)

P. O. Box 65001, Dar es Salaam.

Tel: +255 22 2152489/0302-6

Email address: drp@muhas.ac.tz

I, _____ have read the contents in this form.

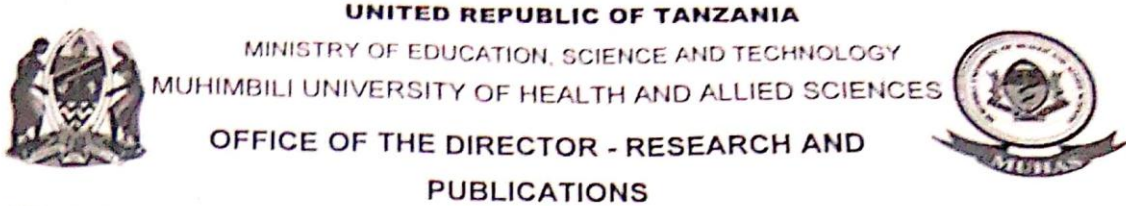
My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of investigator _____

Date of signed consent _____

Appendix 5: Ethical clearance



Ref. No.DA.282/298/01.C/

Date: 07/05/2021

MUHAS-REC-05-2021-594

Halima Mohamed Mhina,
MSc. in Critical Care and Trauma,
School of Nursing
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: VITAL SIGNS RECORDING PRACTICES AND USE IN DECISION MAKING FOR CARING CRITICALLY ILL PATIENTS IN GENERAL WARDS AT MUHIMBILI NATIONAL HOSPITAL, DAR ES SALAAM

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 07/05/2021

EXPIRATION DATE OF APPROVAL: 06/05/2022

STUDY DESCRIPTION:

Purpose:

The purpose of this observational cross sectional study is to assess the quality of vital signs recordings and use in clinical decision making for caring critically ill patients in general wards at Muhimbili National Hospital in Dar es Salaam city, Tanzania.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: <https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%20587.pdf> and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.
8. Apply for and obtain material transfer agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country,
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website <https://drp.muhas.ac.tz/>.




Dr. Bruno Sunguya
Chairman, MUHAS Research and Ethics Committee




Cc: Director of Postgraduate Studies

Appendix 6: Introduction letter



UNITED REPUBLIC OF TANZANIA
 MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
 MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
 OFFICE OF THE DIRECTOR – POSTGRADUATE
 STUDIES



Ref. No. HD/MUH/T.507/2019 10th May, 2021

EXECUTIVE DIRECTOR,
 MUHIMBILI NATIONAL HOSPITAL,
 P.O BOX 65000,
 DSM-TANZANIA.

Re: INTRODUCTION LETTER


The bearer of this letter is Halima Mohamed Mhina (HD/MUH/T.507/2019), a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Nursing Critical Care And Trauma.

As part of her studies she intends to do a study titled: **“Vital Signs Recording Practices And Use In Decision Making For Caring Critically Ill Patients In General Wards At Muhimbili National Hospital”**.

The research has been approved by the Chairman of University Senate.

Kindly provide her with the necessary assistance to facilitate the conduct of her research.

We thank you for your cooperation.



Ms. Victoria Mwanilwa
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Dean, School of Nursing, MUHAS
 cc: Halima Mohamed Mhina

9 United Nations Road, Upanga West, P.O. Box 65001, Dar Es Salaam: Tel. G/Line. +255-22-2150302/6; Ext. 1015; Direct Line +255-22-2151378; Telefax +255-22-2150465; E-mail: dpgs@muhas.ac.tz; Web <https://www.muhas.ac.tz>

Appendix 7: Permission letter

THE UNITED REPUBLIC OF TANZANI
 MINISTRY OF HEALTH, COMMUNITY
 DEVELOPMENT, GENDER, ELDERLY
 AND CHILDREN
MUHIMBILI NATIONAL HOSPITAL



In reply please quote;

Ref. No.: MNH/TRCU/Perm/2021/119

Date: 12th May, 2021

Block Manager

- Mwaisela
- Kibasila
- Sewahaji

Muhimbili National Hospital

RE: PERMISSION TO COLLECT DATA AT MNH.

Name of Student	Halima Mohamed Mhina
Title	"Vital Signs Recording Practices and use in Decicion Making for Caring Critically Ill Patients in General Wards at Muhimbili National Hospital".
Institution	Muhimbili University of Health and Allied Sciences
Supervisor	Dr. Menti Ndile
Co – Supervisor	Mr. Joel Ambikile
Period	12 th May 2021, to 11 th June, 2021

Approval has been granted to the above mentioned student to collect data at MNH.

Kindly ensure that the student abide to the ethical principles and other conditions of the research approval.

Sincerely,

Reid B. Mchome

Coordinator –Teaching, Research and Consultancy Unit



c.c DNS

c.c Halima Mohamed Mhina