FACTORS ASSOCIATED WITH KNOWLEDGE AND PRACTICE OF ESSENTIAL NEWBORN CARE AMONG NURSE-MIDWIVES AT AMANA, MWANANYAMALA AND TEMEKE REGIONAL HOSPITALS IN DAR ES SALAAM, TANZANIA

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By

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Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science (Midwifery and Women's Health) of the

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CERTIFICATION

The undersigned certifies that they have read and hereby recommends for acceptance by the University of Muhimbili Health and Allied Sciences a dissertation entitled *"Factors Associated with Knowledge and Practice of Essential Newborn Care among Nurse-Midwives at Amana, Mwananyamala and Temeke Regional Referral Hospitals in Dar es Salaam, Tanzania"* in partial fulfillment of the requirements for the degree of Master of Science (Midwifery and Women's Health) of Muhimbili University of Health and Allied Sciences.

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DECLARATION AND COPYRIGHT

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

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DEDICATION

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ABSTRACT

Background: Tanzania is among the Sub-Saharan country in Africa with high rates of neonatal mortality. Neonatal deaths occur due to obstetric and newborn complications and mainly due to limited access to essential newborn care (ENC) services which every newborn **needs** to receive for survival. ENC prevents greatly the newborn morbidity and mortality. Regardless of its importance, ENC has been neglected in low and middle-income countries.

Aim: The aim of this study was to assess factors associated with knowledge and practice of essential newborn care among Nurse-Midwives at referral hospitals in Dar es Salaam.

Methods: This was descriptive cross-sectional study conducted at Temeke, Amana and Mwananyamala regional hospitals in Dar es Salaam. An interview administered questionnaire was used to collect data. Data analysis was done with help of Stata version 13.0. Both bivariate and multivariate analyses were employed to determine associations between independent variables and study outcomes. A (95%) confidence index was used to measure statistical association.

Results: The mean age of the 112 nurse-midwives who participated in this study was 36.4 years with standard deviation of 8.2 years. Overall, 53% of nurse midwives had adequate knowledge of essential newborn Care (ENC) and 56% had adequate practice of ENC. Factors associated with knowledge of ENC among Nurse-Midwives included availability of ENC guidelines [AOR=11.69, 95%CI: (1.81-75.61), P=0.010] and regular training of ENC [AOR=4.04; 95%CI: (1.40-11.64), P=0.010]. However, in the multivariate analysis, on job training on ENC in the past two years [AOR=2.99, 95%CI: (1.11-8.10), P=0.031] and availability of ENC guidelines had strong association with ENC practice [AOR=3.78, 95%CI (0.67-21.47), P=0.133].

Conclusion: Findings of this study showed that on-job training and availability of ENC guidelines were significantly associated with knowledge and practice of ENC. Other factors which had positive association with provision of ENC were high education level, greater age, working in labour ward and obstetrics theatre. To ensure effective provision of ENC by Nurse-Midwives, Ministry of health in collaboration with health facilities should ensure availability of ENC guidelines to facilitate provision of ENC and conduct regular training of ENC to improve knowledge and practice of ENC among Nurse-Midwives.

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LIST OF ABBREVIATIONS

ARRH	Amana Regional Referral Hospital
ENC	Essential Newborn Care
HBB	Helping Baby Breath
ICM	International Confederation of Midwives
IMR	Infant Mortality Rate
LW	Labour Ward
MoHDCGEC	Ministry of Health Community Development, Gender, Elderly and Children
MUHAS	Muhimbili University of Health and Allied Sciences
MRRH	Mwananyamala Regional Referral Hospital
NMR	Neonatal Mortality Rate
NCU	Neonatal Care Unity
OBS	Obstetrics and Gynecology
PMS	Percentile mean score
PW	Post-natal Ward
SDG	Sustainable Development Goals
SSA	Sub-Saharan Africa
SoN	School of Nursing
TDHS	Tanzania Demographic Health Survey
TRRH	Temeke Regional Referral Hospital
U5MR	Under-five Mortality Rate
WHO	World Health Organization
^{o}C	Degrees Celsius

DEFINITIONS OF KEY TERMS AND CONCEPTS

Essential newborn care: A comprehensive recommendations designed by WHO to improve the health of the newborn through interventions before conception, during pregnancy and soon after birth. The recommendations include cord care, thermoregulation, initiation of breastfeeding, eye care, vitamin K prophylaxis and infection prevention (1).

Essential newborn care is care every newborn must receive after child birth within 24 hours after delivery and early postnatal period (within 7 days after delivery) (1).

Newborn: Any baby who has 28 days of life after delivery (1).

Knowledge: Knowledge refers to understanding, awareness or thoughtful and skills that one gains through training or practice (2)

Practice: Practice refers to definite use of knowledge or belief as contrasting to concepts about the application.(2)

Nurse-Midwife: Nurse-Midwife is a Nurse with additional training as a Midwife who delivers newborns and provides intra-partum care, postpartum care, newborn care, and some routine care of women.

Thermo Protection: Thermo protection encompasses various ways of preventing a newborn from losing body temperature immediately by drying and covering the head with a hat and maintain skin-to-skin contact with the mother (1,2).

CHAPTER ONE

1.0 Introduction

This chapter presents the problem and its context. This chapter is composed of the following sections: Background to the Study; Statement of the Problem; Objectives of the Study; Significance of the Study; Limitations of the Study; and Conceptual Framework.

1.1 Background to the Study

Worldwide, newborn deaths are still increasing annually from 2.6 million newborns deaths in 2016 or 7,000 newborn deaths every day to 2.9 million newborn deaths annually in 2018, which correspond to (44%) of under-five deaths (3,4). Of all deaths, neonatal mortality (99%) occurs in low-income countries (3,4). The most prevalent neonatal mortalities occur in Southern Asia and Sub-Saharan Africa by 39 percent and (38%), respectively (3,5). Among all neonatal mortalities, five nations accounted for a half that include India, Pakistan, Nigeria, the Democratic Republic of the Congo and Ethiopia(5) . Progress is slower in reducing neonatal mortality rate (NMR) than in reducing mortality rates in children aged between 1 month and 59 months(11,12). While neonatal mortality declined by 49 percent, the mortality in children aged 1 month to 59 months declined by 62 percent from 1990 to 2016 (5).

In Tanzania, the situation is not different. Progress in reducing preventable neonatal deaths has been slower than under-five death rates and infant death rates (6). In the National Road Map Strategic Plan to advance Reproductive, Maternal, Newborn, Child and Adolescent Health in Tanzania (2016 - 2020), in One Plan, the target was to reduce newborn death rate from 32 to 19 per 1000 live births by 2015 (MOHSW, 2008). Unfortunately, the goal was not attained as NMR had declined from 32 per 1000 live births in 2004/05 to 26 per 1000 live births (TDHS, 2010) and 21 per 1000 live births in (2013) (7). Neonatal mortality contributes (40%) of under-five mortality, making almost 37,500 neonatal deaths per year (7). Causes of newborn deaths in Tanzania are not very different from the other low and middle-income countries and they include prematurity complications followed by newborn sepsis and intra-partum events, especially asphyxia and birth injuries (7,8).

Essential Newborn Care (ENC) is a routine care that is provided to all newborns immediately after delivery. The World Health Organization (WHO) has developed a guidelines on ENC that should be used to provide care to the newborn immediately after delivery (1). Despite available Essential Newborn Care (ENC) guides, studies conducted in Uganda and Kenya, show that there is suboptimal basic newborn care practice, which leads to an increase in newborn death rates (4,9). In Southern Tanzania, for instance, it was shown that some of the women were not told the rationale for delay in first bathing of the newborn to at least 24 hours. It was the reason some of them dipped their newborns in cold water after delivery to check if they were healthy (10,11). In due regard, over half of the newborns were bathed within six hours of birth, majority in warm water (10,11). Also, it was found out that majority of women breastfed their newborns within 24 hours after delivery (10,11). Moreover, fewer than 20 percent initiated breastfeeding as suggested by World Health Organization (WHO) to be 60 minutes after delivery (11).

Women who delivered at the health facility have a chance to be educated on the ENC. Studies have shown different and mixed results, with some studies showing that facility delivery with skilled birth attendants is associated with practicing the ENC (2). Women who deliver in the health facilities benefit from counselling and support on how to avert their newborns from hypothermia, early initiation of breastfeeding, cord care, infection prevention and identifying dangerous signs (2). The systematic review of ENC practice in five countries (Ethiopia, Ghana, Malawi, Tanzania and Uganda) found out that there were variations in implementation of all components with universal low practice of skin-to-skin contact with the mother (3). Those were reasons that made the researcher to focus on assessment of factors associated with knowledge and practice of ENC among Nurse-Midwives at Amana, Mwananyamala, and Temeke referral hospitals in Dar es Salaam region, Tanzania.

1.2 Statement of the Problem

Essential Newborn Care includes thermal care, cord care, initiation of breastfeeding 60 minutes after delivery, eye care and giving vitamin K supplementation (1,4). Despite availability of these guidelines, studies conducted in Sub-Saharan African countries have identified knowledge gap on providing ENC among Nurse-Midwives (8,12,13).

Furthermore, in Tanzania, early initiation of breastfeeding declined from 59 percent to 49 percent whereby 31 percent of the newborns were given pre-lacteal feed before initiation of breast milk (7). Thermo care for low birth weight was less than 20 percent and the practice of preventing newborn infection was low (7). Also, it was reported that prevention of infection was a difficult task because 60 to 80 percent of health facilities lack sterile equipment and 50 percent of health facilities do not perform hand washing due to shortage of running water and soap, despite efforts made by the Tanzanian Government to reduce high newborn mortality (7).

Most of neonatal mortalities are associated with birth asphyxia (26%), complication of prematurity (27%) and infections (29%) whereby up to two-thirds (34,000) of such deaths could be prevented through ENC (6). Other studies have reported that Nurse-Midwives had poor practice on essential newborn care components, specifically thermo care, prevention of infection, administration of vitamin K, eye care, timing of cord clamping including cutting, and recognition of dangerous signs (11,12). These made the newborns to be discharged from nurseries without eye care and vitamin K. As a result, they become susceptible to complications like eye infection and bleeding (1). Although inadequate knowledge on ENC has been reported as one of factors that made midwives unable to provide essential care to the newborns at birth, other factors may exist (8). Therefore, this study aimed at assessing factors associated with knowledge and practice on essential newborn care among Nurse-Midwives in Dar es Salaam region Tanzania.

1.3 Conceptual Framework

A conceptual framework is the researcher's understanding of how particular variables in the study connect with each other (14). Thus, it identifies variables required in the research investigation and it is the researcher's map in pursuing the investigation (14). According to different studies, the conceptual framework shows that most factors relate to each other. Therefore, the researcher decided to formulate the conceptual framework for easy understanding some of the factors associated with practice of ENC. The following factors were used to construct conceptual framework: availability of ENC guidelines, education qualification, working experience, beliefs, workload, in-service training on ENC and interest of working at maternity and neonatal unit (8,10,15,16). These factors have a direct

relationship to each other and they show association between them and Nurse-Midwives practice of ENC (12).

INDEPENDENT VARIABLES   **DEPENDENT VARIABLES**

Socio-demographic factors
   Age
Sex
   Education qualification
Work experience

Knowledge and practice of essential newborn care

   Thermal care.
   Breastfeeding within one hour.
   Cord care within 24hours.
   Provision of vitamin K.
   Eye care.

Health system factors
   Availability of ENC
   guidelines
   Workload
   Offer on job training on
   ENC
   Allocation of Nurse and
   Midwives according to
   their interest of working
   labour, ward, postnatal
   and neonatal ward

Individual related factors
   Beliefs
   Working area
   Knowledge of ENC
   Attended refresher
   course of ENC
   Interest of providing
   neonatal care

Figure 1: Conceptual Framework Developed by the Researcher.

1.4 Significance of the Study

This study assessed factors associated with practice of essential newborn care among Nurse-Midwives at Amana, Temeke, and Mwananyamala regional hospitals in Dar es Salaam, Tanzania. Results from this study give insight that can be used to develop strategies to improve practice on ENC among Nurse-Midwives who work in labour ward, postnatal ward and neonatal ward at Amana, Mwananyamala and Temeke hospitals as well as other hospitals in Tanzania. Also, they will be used as a baseline to inform both policy makers and curriculum developers to put further emphasis on improving ENC according to standards in the preserve curriculum so that graduates can be updated and can work without requiring refresher training, which is time-consuming and expensive. Therefore, this information may be useful in reducing neonatal morbidity and mortality rate in Dar es Salaam Region.

1.5 RESEARCH QUESTION

This study was guided by the following research questions:

1.5.1 Main Research Question

What factors are associated with knowledge and practice of ENC among Nurse-Midwives at Amana, Mwananyamala and Temeke regional hospitals in Dar es Salaam, Tanzania?

1.5.2 Specific Research Questions

   i.   What socio-demographic factors are associated with knowledge and practice of ENC among Nurse-Midwives at regional hospitals in Dar es Salaam?

  ii.   What individual factors are associated with knowledge and practice of ENC among Nurse-Midwives at regional hospitals in Dar es Salaam, Tanzania?

 iii.   What health facility factors are associated with knowledge and practice of ENC among Nurse-Midwives at regional hospitals in Dar es Salaam, Tanzania?

1.6 Research Objectives

1.6.1 Main Objective

The main objective of this study was to assess factors associated with knowledge and practice on ENC among Nurse-Midwives at Amana, Mwananyamala and Temeke reginal hospitals in Dar es Salaam region, Tanzania.

1.6.2 Specific Objectives

This study had the following specific objectives:

   i.   To identify socio-demographic factors associated with knowledge and practice of ENC among Nurse-Midwives at regional hospitals in Dar es Salaam;

  ii.   To determine individual factors associated with knowledge and practice of ENC among Nurse-Midwives at regional hospitals in Dar es Salaam, Tanzania; and

 iii.   To determine health facility factors associated with knowledge as well as practice of ENC among Nurse-Midwives at regional hospitals in Dar es Salaam, Tanzania.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 General Overview

Essential newborn care is very important in reduction of neonatal morbidity and mortality. To ensure effective provision of ENC, Tanzania national target is to reach 75 percent in provision of ENC services in every health facility conducting deliveries (17). Newborns are much more susceptible to complications and even death within one hour and within 28 days of their lifetime and regardless of knowing this critical period, some proven interventions like the initiation of breastfeeding within 60 minutes after delivery, which can save the life of the newborns by 44 percent are still missed (12). Simple and cost-effective interventions can avert up-to 75 percent of newborns' death within the first week of their life (18). Such interventions are; thermoregulation, cord care, initiation of breastfeeding within one hour, vitamin K prophylaxis, eye care, recognition of dangerous signs and immunization (1,2). To reduce neonatal deaths greatly depend on quality of care received by newborns soon after delivery (8). Key terms used to review literature were knowledge on ENC, practice of ENC and factors associated with knowledge and practice of ENC among nurse midwives.

2.1 Essential Newborn Care

2.1.1 Introduction

For every newborn, regardless of term, preterm or small for dates, ENC should be provided after delivery and proceed with it at least for 7 days post-delivery. Most of the ENC interventions are very simple whereby they can be provided by every skilled birth attendant.

2.1.2 Airway Management

Babies born with clear amniotic fluid and initiate breathing on their own do not undergo routine suction after delivery. The intra-partum suction of the nose and mouth at delivery of the head in neonates born with meconium is not recommended (1). The same is for neonates born with meconium and start spontaneous breathing are not recommended (1). Newborn babies who do not initiate breathing on their own after thorough drying should be stimulated by rubbing on their back two to three times before cord clamping as well as

cutting and initiating positive pressure ventilation, but neonates born with meconium who do not breath spontaneously, nose, mouth and tracheal suction should be done before positive pressure ventilation (1). A study conducted in Ethiopia revealed that average knowledge of newborn resuscitation [60.48%, 75.4% (n=205)] knew the right measure of newborns resuscitation to call for help, while 62.1 percent (n=169) knew the right position of the baby's head to be slightly extended, 34.2 percent (n=93) were aware of newborn breath per minute to be 40 and 66.6 percent (n=181) checked as well as sucked airways of all babies delivered (12). A study conducted in Tanzania (in 2014) to assess improvement in newborn care and newborn resuscitation showed that skills and practice of health care providers on steps helping baby breath were incorrectly performed in 9 health facilities in Tanzania (19).

2.1.3 Thermal Care

Thermoregulation is an adjustment of newborn body temperature at birth, maintaining to normal body temperature, which ranges 36.5 degrees Celsius (^{o} C) to 37.5^o C (1). Body temperature regulation in newborn babies is less efficiently undertaken compared to adults and loss of body temperature in newborns is easier than for adults, making a life of preterm and low birth-weight at high risk to hypothermia (2). To prevent heat loss of neonate immediately after birth, the following measures must be carried out: immediate drying, wrapping, skin-to-skin contact with the mother and delayed bathing for 24 hours (3). In case of cultural issues, WHO (2017) recommended that neonate bathing has to be delayed for at least six hours after delivery (1). The result from a systematic review conducted in several data from various countries of Sub-Saharan Africa (SSA) showed that levels of drying and wrapping the newborn immediately after birth were high in Mozambique and Ethiopia but very low in Ghana, Tanzania and Malawi (3)**.** Another study conducted in Ethiopia (2017) revealed that 75.6 percent of health care providers knew how to stabilize temperature of newborn soon after delivery (8).

2.1.4 Cord Care

Late cord clamping is recommended in every newborn immediately after delivery (after 1 to 3 minutes after birth) meanwhile initiating ENC (1). Cord clamping less than one minute is not recommended, unless resuscitation is needed. Application of Chlorhexidine 4

percent in the umbilical stump during the first week is recommended only in newborns who are at risk of infection and where NMR is greater than 30 per 1000 live births (1). Clean cord care is crucial because it aids in prevention of newborn infection as it is well known that umbilical cord stump is a source of infection(s) if safety measures are not properly taken after delivery. A study carried out in Ethiopia disclosed that only 37.9 percent had knowledge on the right time of cord clamping and 13.6 percent washed their hands before conducting deliveries (12). A systematic review from SSA that included majority of qualitative and quantitative data from five countries revealed that cord care differs from one country to another. It was disclosed that in Ghana and Mozambique, they apply hospital medicine/spirit or shea butter, in Ethiopia they apply butter, in Tanzania and Mozambique they apply cooking oil or herbs and in Uganda, they apply salt water or herbs, practices, which are totally contradictory to WHO guidelines (3).

2.1.5 Initiating Breastfeeding

The recommended initiation of breastfeeding of the newborn after delivery is within one hour and when both mother and the newborn are clinically stable (1). The national target was to increase percentage of initiation of breastfeeding within one hour after delivery from 41 percent to 90 percent by 2020 (17). Initiation of breast feeding within one hour after delivery helps to reduce the risk of hypothermia and hypoglycemia (12). However, a study conducted in Vietnam (2009), stated that most of the study participants had adequate knowledge on the right time to initiate breastfeeding but unfortunately, they lacked knowledge on duration of breastfeeding according to WHO recommendations (20).

2.1.6 Vitamin K Prophylaxis

Administration of vitamin K 1 milligrams (mg) IM should be given to all term babies in the first 60 minutes after delivery and 0.5 mg to preterm as well as small babies to prevent risk from bleeding (1). Newborns are usually deficient of vitamin K, which may cause severe bleeding of the baby within seven days post-delivery (21). Concerning vitamin K, only 38.97 percent knew its indication for newborn that it works to prevent newborn bleeding and 41 percent of health care providers had knowledge on its right dose for term and preterm newborns (8). In a study conducted in Ethiopia, it was revealed that 16.9

percent of health care providers administered vitamin k to all newborns, 59.9 percent gave to some newborns and 23.2 percent did not give at all (12). Another study done in northwestern facility of Tigray in Ethiopia (2018), stated that 64.8 percent (n = 116) had knowledge on ENC (16).

2.1.7 Eye Care

Within 60 to 90 minutes after delivery, eye care of the newborn can avert serious infections and problems such as blindness. Tetracycline 1 percent ointment should be applied inside the eye, beginning at the side closer to the nose and extending to the opposite side of the eye lid (21). Eye care is provided to the newborn within one hour after delivery to prevent infections such as gonorrhea, which can cause blindness to the newborn. A study conducted at Karachi, Pakistan showed that 68 percent of women put kohl to their baby's eyes within percent days after delivery (22).

2.2 Practice of Essential Newborn Care

A systematic review from 33 countries of SSA whereby five countries (Malawi, Ethiopia, Ghana, Mali and Tanzania) revealed that about 50 percent of newborns were bathed within six hours and over 50 percent bathing activities were done in the hospitals. However, in Malawi and Tanzania, it was found to be uncommon due to lack of water supply in the facilities (3). Another study that was conducted in Ethiopia showed that 72.77 percent provide good ENC and such results were almost similar to those uncovered in Vietnam and Egypt, but higher than results from studies done in Haryana (India), the Sudan and Addis Ababa (Ethiopia), which disclosed the same at 55 percent, 41 percent, and 39 percent, respectively (8). Moreover, another study conducted in Lwara District in Ghana revealed that only 15.8 percent (n=418) had overall good ENC practice (23). A study done in Jimma zone, Ethiopia revealed that cord care to prevent infections had 37.9 percent were still using alcohol to clean the umbilical stump. Again, that was against WHO guidelines of 2017 that hold that nothing should be applied except for the baby who was born at home whereby Chlorhexidine 4 percent is used for infection prevention (12). Concerning breastfeeding, a study from eight countries from SSA revealed that initiation of

breastfeeding within one hour was not done because they believed that immediately after delivery, babies did not show any signs of hunger but they needed rest after delivery (3).

2.3 Factors Associated with Knowledge on ENC among Nurse-Midwives

Practice of ENC is influenced by several **factors** that include; socio-demographic, an individual and health facility related factors. Numerous literatures reported availability of ENC guidelines, education qualification, working experience, beliefs, workload, in-service training on ENC and interest in working in maternity as well as neonatal units are significant factors associated with level of knowledge on ENC (8,10,15,16). Looking at an individual study on ENC practice, the study in North-western zone of Tigray (2019) revealed that lack of equipment for ENC accounted for 2.4 times higher to have poor knowledge on ENC [(AOR = 2.4 95%CI: 1.12-5.16)] (16).

Knowledge plays a great role in responsibilities of health care providers on ENC. There are varieties of factors associated with knowledge on ENC among nurse-midwives (24). A study done in Indonesia included 409 health care provider reported that age, in-service training on newborn care and supervision have positive influence on knowledge of health workers towards ENC (24). With limited knowledge among health workers, authors recommended the need to improve knowledge of maternal and newborn care guidelines among midwives and nurses in Indonesia (24).

Another study in Southern Ethiopia by Arba and Zana that included 218 nurses and midwives who were working in the delivery unit found out that type of profession (AOR = 5:79, [2.47, 13.58]), education level (AOR = 3:26, [1.42, 7.52]), interest to work in delivery room (AOR = 4:85, [1.89, 12.42]), and presence of guidelines (AOR = 2:29, [1.18, 4.45]) were significant factors associated with adequate knowledge of essential newborn care (25). Such results are similar to those from another study by Jimma conducted in Addis Ababa (2016), which found that education qualifications was significantly associated with knowledge of health care provider on ENC (p<0.001). Also, those with diploma qualification were 0.250 times less likely knowledgeable on ENC than graduates [AOR (95% CI) 0.250 (0.120-0.523)]. In addition, they found that nurse-

midwives who had interest in working on maternity unit were 2.822 times more likely knowledgeable than those with no interest [(AOR= 2.822; 95%CI: 1.372-5.807) 15].

In Tanzania, a cross-sectional study that included 330 respondents who encompassed different health facilities found that persons working in hospitals were more likely to have adequate knowledge compared to those working in health centers (AOR= 3.227, P< 0.001). Also, enrolled nurses were more likely to have adequate knowledge (AOR= 3.118, P<0.05) than assistant medical officers or medical doctors. Those who attended once on neonatal resuscitation training had significant adequate knowledge compared to those who never attended (AOR=1.778, P<0.05). Therefore, from their findings, it can be summarized that working facility, professional qualification, and training were significantly associated with knowledge (26).

2.4 Factors Associated with ENC Practice among Nurse-Midwives

Negative beliefs were reported to limit practice of ENC. A study conducted across four countries in Nepal, Bangladesh, Pakistan and India reported that cultural beliefs that such as drying and covering the baby had to be done after delivery of the placenta; skin-to-skin care may harm the newborn; and bathing of the newborn was done immediately after delivery believing to be a way of keeping the bay clean as well as smart, which is contrary to WHO guidelines of 2017 concerning timing for bathing a newborn (10).

Another study in North-western zone of Tigray (2019) in Ethiopia, revealed that workload and training were found to have significant association with the level of practice of health care provider on ENC. Their findings indicated that the health care providers who were trained on ENC were 2.09 times higher to have good level of practice than those who were not trained on ENC (16). A study in SSA, particularly in Ethiopia (2017), identified that availability of National guidelines in the facility was associated with provision of ENC (8).

Another study in Ethiopia (2017) reported that field of study, education level, interest to work in delivery room, and in-service training were significantly associated with practice of essential newborn care. Priority on provision of ENC should be given to those who were trained on delivery and newborn care service, and incorporation of all components of essential newborn care in curriculum (12). In Tanzania, a study conducted in 2018 found

out that working facility, experience, and ENC supplies were significant factors associated with practice of ENC (26).

CHAPTER THREE

3.0 Research Methodology

3.1 Research Design

This study employed descriptive cross-sectional study design (16) to assess factors associated with knowledge and practice of ENC among Nurse-Midwives at Amana, Mwananyamala and Temeke reginal hospitals in Dar es Salaam region. The cross-sectional study design was used because it is relatively quick and inexpensive (27), considering limited time that was available for data collection. Moreover, the design allowed data collection of multiple variables and found out how they were related to variables of interest, which were factors associated with practice of ENC among Nurse-Midwives who provide newborns' care at Amana, Temeke, and Mwananyamala regional hospital in Dare es Salaam Tanzania.

3.2 Study Area and Setting

3.2.1 Study Area

This study was conducted at three regional hospitals namely Amana, Mwananyamala, and Temeke in Dar es Salaam region, Tanzania. Geographically it is located between latitudes 6.36 degrees and 7.0 degrees to the south of the equator and longitudes 39.0 and 33.33 to the east of the Greenwich meridian (28). It is also bounded to the Indian Ocean to the east and the Coast Region on the west. There are five Municipalities in Dar es Salaam region namely Kinondoni, Temeke, Ilala, Kigamboni and Ubungo. Ilala, Kinondoni, and Temeke municipal are highly populated areas with approximately greater than 4.3 million people (28); Amana hospital is located at Ilala municipality, Mwananyamala hospital is situated at Kinondoni municipality and Temeke hospital is situated at Temeke municipality. The three hospitals are regional referral hospitals, which provide a wide variety of health care services such as obstetrics and gynaecology, internal medicine, paediatrics, surgery, dentistry, ophthalmology, orphanage unit as well as reproductive and child health (RCH) clinic.

3.2.2 Study Setting

The study was conducted at neonatal ward, postnatal ward, labour ward and Obstetric (OBS) theatre at Amana, Mwananyamala, and Temeke regional hospitals in Dar es Salaam region Tanzania. These hospitals are the main referral hospitals and have neonatal units that provide care to the large number of newborns from within and outside the hospitals. Estimated number of newborns delivered per month at Amana hospital is 1200 newborns with 48 Nurse-Midwives working with care of newborns. At Mwananyamala, estimated number of newborns delivered per month is 2000 with 36 Nurse-Midwives working with care of newborns, while at Temeke Hospital, estimated number of newborns delivered per month is 2500 newborns with 53 Nurse-Midwives working with care of newborns. All these hospitals have 137 Nurse-Midwives working with newborns' care.

3.3 Study Population

The target population were Nurse-Midwives from labour ward, neonatal ward, postnatal ward and Obstetric theatre (OBS) at Temeke, Amana and Mwananyamala regional hospitals in Dare es Salaam. In this study, Nurse-Midwife commonly provide care to the newborns during child birth and postnatal period. There were 137 Nurse-Midwives working in labour ward, neonatal ward, postnatal ward and obstetrics theatre at Amana, Mwananyamala, and Temeke regional hospitals. The Nurse-Midwives were targeted because they are responsible for providing ENC after delivery and before discharge of the newborns from the hospital

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

All Nurse-Midwives who provide care to the newborns in labour ward, postnatal ward, neonatal ward and obstetric theatre at Mwananyamala, Temeke and Amana hospitals.

3.4.2 Exclusion Criteria

Nurse-Midwives who were sick during the data collection period were not involved in the study.

3.5 Sample Size Calculation

The sample size was obtained using the formula for estimating sample size with finite population according to Kothar 2008 (29). The following formula was employed:

$$n = \frac{z^2.N.\sigma^2}{(N-1)e^2 + Z^2\sigma^2}$$

Whereby

n = size of sample

N = size of population = 137 (Total number of Nurse-Midwives who provide newborns care in Amana, Temeke and Mwananyamala hospitals).

e = acceptable error (the precision) = 0.08

σ= standard deviation of population = 8.7, estimated from the distribution of number of midwives present in the three selected hospitals (36, 48 and 53).

z = standard variety at 95 percent confidence level = 1.96

Therefore, the desired sample size was obtained by including the presented parameters:

$$n = \frac{1.96^2.137.8.7^2}{(137-1)0.08^2 + 1.96^2 8.7^2} \cong 106$$

Adjusting for non-response, 10 percent of estimated sample size was added

106 x 0.1=10.6$\cong$11

106 + 11=117 thus, a total expected sample was 117.

3.6 Sampling Procedures

Stratified sampling procedure was used to obtain representative sample of Nurse-Midwives from each selected hospital that encompassed 117 Nurse-Midwives. From stratified sampling method, a representative sample from each hospital was obtained using proportion allocation formula $n_i = \frac{p_i}{N}$, where N was the total Nurse-Midwives in three hospitals, p_i and n_i indicated number of Nurse-Midwives present in each specified hospital and estimated sample size from each facility, $i = 1,2,3$.

The researcher employed stratified sampling procedure because the target population was in different study cites (Amana, Temeke and Mwananyamala hospital) (29), They were distributed into three non-overlapping sub-populations also called strata as per number of Nurse-Midwives from the three regional hospitals. In order to obtain representatives from each hospital through proportion allocation formula, the following calculations were done:

Facility Name	# Nurse-Midwives (p_i)	Estimated sample ($n_i = \frac{p_i}{N} * n$)
Amana	48	41
Mwananyamala	36	31
Temeke	53	45
Total (N)	137	Total sample, n= 117

Therefore, representatives from each hospital were 41, 31, and 45 Nurse-Midwives working with newborns at Amana, Mwananyamala and Temeke regional hospitals, respectively. Five study participants were excluded from the study during interviews. Three from Amana regional referral hospital (ARRH) were excluded due to emergencies in the ward at different occasions. They went to attend clients and thereafter, they did not show up to finish interviews. The rest (2) out of the five excluded in the study were from Temeke regional referral hospital (TRRH) whereby one left for her sick baby in the middle of interview and one went to an official meeting and did not return for interview. Thus, it led to remain with 112 Nurse-Midwives who completed interviews.

3.7 Study Variables

3.7.1 Independent Variables

The following were independent variables for the study:

- Facility type (hospital, health center, dispensary);
- Facility ownership (public, private, faith based);
- Education qualifications;
- Years of working experience at LW, NW, PW and OBS Theater.
- The number of midwives working in LW, PW, NW and OBS Theatre.
- Availability and use of ENC guideline.

3.7.2 Dependent Variable

- **Knowledge of essential newborn care**
- Practice of essential newborn care.

3.8 Data Collection Tool and Methods

3.8.1 Data Collection Tool

This study employed structured questionnaire for the data collection. The questionnaire were developed by the researcher after literature review following WHO guideline of essential newborn care (1). The questionnaires were prepared in English language. Questionnaire contained both closed and opens ended questions; comprises of three sections. Section A comprises of 11 socio-demographic questions, Section B comprises of 11 questions regarding knowledge on ENC, Section C had 17 essential items for newborn care; these were thermal care, breastfeeding, cord care, vitamin K supplements and Eye care. And Section D had 7 perceived factors for ENC these have been developed to provide accuracy information on practice of ENC among Nurse-Midwives. Before actual data collection the questionnaire was tested for validity and reliability. Internal consistency was used to measure the reliability of the data collection tool. To check the reliability of the questionnaire, pre-test of the questionnaire was done for 11 Nurse-Midwives at Sinza maternity wards and thereafter the necessary modifications were made accordingly. Results were used to correct any inconsistencies in the instrument before the actual data collection. In the actual study the same questionnaire was used.

3.8.2 Data Collection Methods

In this study, data was collected by using an interviewer administered structured questionnaire with solely closed and open-ended questions. The researcher and two research assistants who had experience in data collection including experience in ENC were involved during data collection. Two days before actual data collection two research assistants were oriented on how to collect data. The orientation included description of the overall study purpose, objectives, and data collection method, also there were instructions on how to administer the questionnaire. In charges of the units (neonatal unit, labour ward, postnatal ward and Obstetric theatre) assisted the researcher to identify eligible nurse midwives, and then the researcher or research assistant approached them and explained the process of data collection and issues of confidentiality. All nurse midwives agreed to participate in the study completed the questionnaire. Interviews were done after the nurse-midwives have completed their shifts in the quite room identified by the incharges of the unit. Each questionnaire was examined for completeness before they were collected for analysis. Data collection took approximately 3 weeks.

3.9 Pre-test of the Questionnaire for Validity and Reliability

Validity refers to degree to which an instrument measures what it was supposed to be measured (30). For reliability, an instrument can be said to be reliable if it measures accurately and reflects true measures of the attribute under investigation (30). To determine effectiveness and validity of the study questionnaire, pre-testing of the study questionnaire was conducted among 11 Nurse-Midwives from Sinza hospital one week prior to actual data collection. For the purpose of attaining confidence to ascertain attributes for ENC, Cronbach's alpha reliability test was done to identify the point to which it was error-free. The results showed the Cronbach's alpha score of 0.79, which indicated that the scale had internal consistency. However, the items with less internal consistency were deleted and adjustment was made for reliability of the study tool.

Also, content validity of the research questionnaire was checked by the researcher's supervisors and two health care providers: the first one was a senior Pediatrician from John's Hopkins Program for International Education in Gynecology (JHPIEGO) Tanzania and the second one was a senior Pediatrician from Neonatal Unit at ARRH. They provided

suggestions that ENC practice questions should be modified based on components of ENC. Such components included Thermo protection, Eye care, vitamin K administration and early initiation of breastfeeding. Also, typological errors were corrected to maintain data accuracy and appropriate adjustments were made.

3.10 Data Analysis

Data were coded, entered, cleaned and analyzed by using Stata Version 13.0. Data entry and cleaning were performed by the researcher with the aid of a statistician to ensure that no information missed. A total of 117 Nurse-Midwives gave voluntary informed consent for participation in this study. However, 5 questionnaire were incomplete as they missed potential variables and therefore were excluded during analysis. The remaining information from 112 participants was analyzed 43 TRRH, 38 ARRH, and 31 from MRRH. To determine knowledge score, 11 questions were graded, each question was given 1 point if it was responded correctly and 0 if the response was incorrect (8). Participants who were able to answer 7 questions and above equals to 60% were regarded to have adequate knowledge and those who answered less than 7 question's or scored less than 60% were regarded to have inadequate knowledge on ENC (4). Likewise, to determine practice score, 17 questions based on 5 components of ENC (Thermo protection, initiation of breastfeeding within 60 minutes, eye care, vitamin K injection and cord care) were graded, each question was given 1 point if it was responded correctly and 0 if the response was incorrect. Participants who scored above 70% were regarded to have adequate practice and less than 70% were regarded to have inadequate practice on ENC (16).

Then, bivariate analysis was computed to determine variables associated with Knowledge and Practice of the ENC using crude odds ratios. Multivariate logistic regression was run for all variables to identify independent predictors of knowledge and practice on ENC. Then, 95 percent confidence interval (CI) was used to measure the statistical association and it was considered significant if P value was less than 0.05. Finally, the results were presented in texts, tables, graphs and figures.

3.11 Ethical Considerations

Before data collection ethical clearance to conduct this study was obtained from Muhimbili University of Health and Allied Sciences' (MUHAS) Senate, Research and Publication Committee with reference Institutional Review Board (IRB NO: MUHAS-REC-04-2020-267). An introductory letter from MUHAS was taken to Ubungo Municipal Director. Then, research permit with Reference Number AB.27/333/58 from Ubungo Municipal Council was taken to Sinza Medical Officer In-charge for the pilot study. Other three introductory letters were taken to Medical Officers in- charge of Amana, Temeke and Mwananyamala hospitals whereby research permits were obtained from all three regional hospitals. A written informed consent was obtained from the study participants after being briefed about the purpose of the study, objectives, risk and benefits from participating in the study. Also, participants were informed about rights to withdraw from the study at any time, which had to result to deletion any information from the participant. Using serial numbers instead of names to identify participant's ensured maintenance of confidentiality and anonymity.

3.12 Dissemination of Results.

Results from this study will be disseminated at Muhimbili University of Health and Allied Sciences as partial fulfillment of the requirements for the award of Master of Science degree in Midwifery and Women's Health. Moreover, such findings will be submitted to MUHAS library for use. The findings will be published to peer review journal for wide range of scholars to read and advance their knowledge. In addition, results from this study will be submitted to respective hospital authorities from whom the study was conducted; Mwananyamala, Temeke and Amana hospitals for improving Midwives' practices on ENC. Furthermore, the findings were presented to national and international scientific conferences.

CHAPTER FOUR

4.0 PRESENTATION OF STUDY FINDINGS AND DATA ANALYSIS

4.1 Participants' Demographic Characteristics

The mean age of the participants was 36.4 years with standard deviation of 8.2 years. About half (49%) were aged between 30 and 39 years old. Most (82.1%) of the participants were females. More than half (56.3%) reached diploma as their highest education qualifications and (54.5%) had experience for more than three years working with newborns. About (59.8%) attended refresher courses on ENC (Table 1).

Table 1: Characteristics of the study participants (N=112)

Variables	n	%
Age (years)		
20-29	21	18.8
30-39	55	49.1
≥40	36	32.1
[Mean; SD]	[36.4.; 8.2]	
Sex		
Male	20	17.9
Female	92	82.1
Education level		
Certificate level	39	34.8
Diploma level	63	56.3
Higher level	10	8.9
Experience working with newborn		
<1 yr	16	14.3
1-3 yrs	35	31.3
>3 yrs	61	54.5
In which ward/unit do you most often work		
Newborn ward/unit	27	24.1
Postnatal ward	38	33.9
Labour ward	32	28.6
OBS theatre	15	13.4
Attended refresher course of ENB		
Yes	67	59.8
No	45	40.2
On job training in the past 2 years		
Yes	81	72.3
No	31	27.7

4.2 Knowledge and Practices of Essential Newborn Care

4.2.1 Knowledge of Essential Newborn Care

Overall adequate knowledge on ENC was (53%), it indicates that 1 in 2 Nurses-Midwives from the sites had adequate knowledge of ENC. Majority of the participants responded correctly on measures to be taken if the baby born not crying accounted for (93%), the indication of administering vitamin K to the newborns (76%), measures to be taken if the baby is not breathing after stimulation (71%), the right time to initiate breastfeeding after delivery (71%), the recommended right time of bathing a newborn (70%) and methods of thermo protection (69%). However, several participants had limited knowledge on normal breathing rate per minute of newborns, the best position of the baby to allow airway opening, and the right dose of vitamin K (Figure 2).
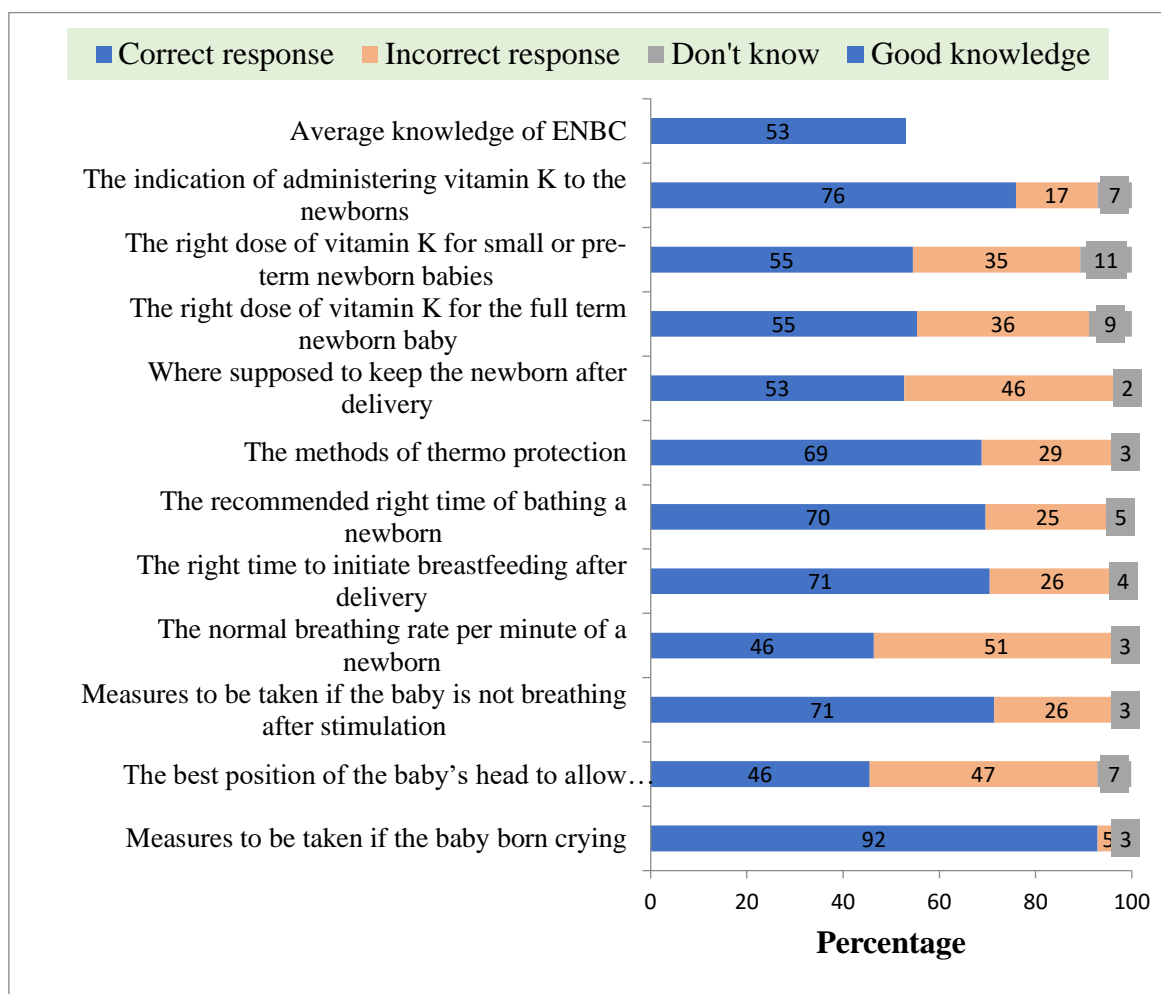

Figure 2: Knowledge of Essential Newborn Care (n=112)

4.2.2 Essential Newborn Care Practice

Regarding practices of ENC, about 56.3 percent of participants had adequate practices of ENC. It implies that a high number of the participants (43.7%) had inadequate practices of ENC. However, (58.9%) participants mentioned ever provided ENC. Majority reported immediately dried the baby by wiping thoroughly and checked breathing while drying; removed wet cloth (es) to start skin-to-skin contact with mother; covered the baby with dry cloth (es) as well as head with hat; provided routine postnatal care (re-examine the baby before discharge); counseled the mother to continue with ENC before discharge or after 24 hours of delivery and the like (Table 2).

Table 2: Essential Newborn Care Practices (n=112)

ENC	C/A	Practice	
		n	%
Ever provided essential newborn care	Y	66	58.9
Immediately dry the baby and check breathing while drying	Y	109	97.3
Remove wet cloth to start skin-to-skin contact with mother	Y	108	96.4
Cover the baby with dry cloth and head with a hat or khanga	Y	93	83.0
Continue skin-to-skin contact on mother's abdomen	Y	71	63.4
Separate the baby from the mother for at least 60 minutes	N	60	53.6
Ever put on sterile gloves before assessing cord stamp	Y	91	81.3
Always observe the cord for signs of infection and bleeding	Y	88	78.6
Apply anything like Chlorhexidine or spirit in the cord stamp	N	17	15.2
Apply Chlorhexidine to the umbilical stamp for the baby who born before arrival (BBA).	Y	3	2.7
Initiate breastfeeding within 60minutes after delivery	Y	99	88.4
Eye care by administering TTCL 1% eye ointment within 90 minutes after delivery	Y	12	10.7
Monitoring of the newborn every 15 minutes for the first 24 hours	Y	71	63.4
Postpone bathing of the baby at least for 24 for hours after delivery	Y	78	69.6
Examine the baby weight and record after checking body temperature	Y	75	67.0
Provide vitamin K injection after checking body weight of the baby	Y	19	17.0
Provide routine postnatal care -re-examine the baby before discharge	Y	106	94.6
Counsel the mother to continue with ENC before discharge or after 24 hours of delivery	Y	108	96.4
Average practices of ENC		63	56.3

C/A=correct answer, n = number of study participants, Y=yes, N = no

4.2 Summary of Knowledge and Practice of Essential Newborn Care

Results indicated that overall adequate knowledge on ENC was 53%, this indicates that 1 in 2 Nurses-Midwives from the study sites had adequate knowledge of ENC. Regarding practice of essential newborn care, about (56%) of participants had adequate practice of ENC. It implies that a high number of participants (47%) and (44%) had inadequate knowledge as well as practice of ENC (Figure 3).
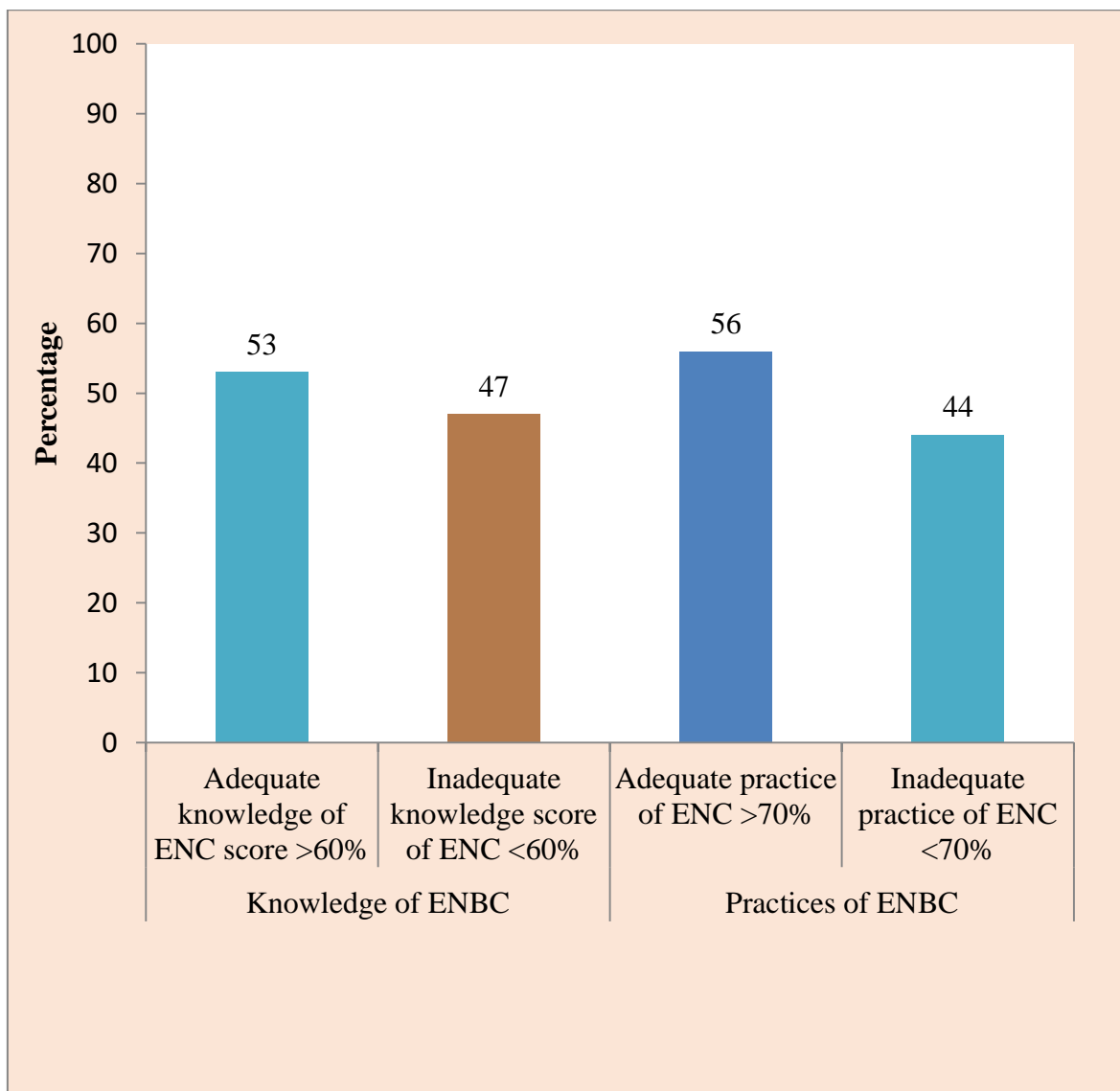

Figure 3: Knowledge and Practice of Essential Newborn Care (n=112)

4.3 Socio-demographic Factors Associated with Knowledge and Practice of ENC

4.3.1 Socio-demographic Factors Associated with Knowledge of ENC

Socio-demographic variables that were positively associated with knowledge of ENC in bivariate logistic regression were 40 years old and above [COR=3.03, 95%CI: (0.94-9.75)], female sex [COR=1.14; 95%CI: (0.43-3.01)], and having a higher education level [COR=2.46; 95%CI: (0.53-11.34)], but none were statistically significant (Table 3). Three years of experience of ENC at work also indicated an increase in knowledge of ENC compared to less experience than 1 year [COR=1.72; 95%CI: (0.46-6.40)]. In the multivariate analysis, variables, which showed positive association were aged between 30 and 39 years [AOR=1.12; 95%CI: (0.32-3.93), P=0.858]; 40 years old and above [AOR=2.96, 95%CI: (0.81-10.76), P=0.100]; higher education level [AOR=2.53, 95%CI: (0.48-13.21), P=0.271]; experience working with newborn one year to three years [AOR=1.30; 95%CI: (0.34-4.89), P=0.702]; and more than three years [AOR=1.72; 95%CI: (0.46-6.40), P=0.421]; while sex showed negative association with knowledge of ENC [AOR=0.87; 95%CI: (0.31-2.44)]; and none of the socio-demographic variables were statistically significantly associated with knowledge of ENC. (Table 3).

Table 3: Socio-demographic Factors Associated with Knowledge of ENC (N=112)

Variables	N	Adequate knowledge of ENC n (%)	Bivariate COR(95%CI)	Multivariate AOR(95%CI)	P-value
Age (years)					
20-29	21	9(42.9)	1.00	1.00	
30-39	55	25(45.5)	1.11(0.40-3.09)	1.12(0.32-3.93)	0.858
≥40	36	25(69.4)	3.03(0.94-9.75)	2.96(0.81-10.76)	0.100
Sex					
Male	20	10(50.0)	1.00	1.0	
Female	92	49(53.3)	1.14(0.43-3.01)	0.87(0.31-2.44)	0.792
Education level					
Certificate level	39	19(48.7)	1.00	1.00	
Diploma level	63	33(52.4)	1.16(0.52-2.59)	0.98(0.42-2.31)	0.983
Higher level	10	7(70.0)	2.46(0.53-11.34)	2.53(0.48-13.21)	0.271
Experience working with newborn					
<1 yr.	16	7(43.8)	1.00	1.00	
1-3 yrs.	35	17(48.6)	1.21(0.36-4.04)	1.30(0.34-4.89)	0.702
>3 yrs.	61	35(57.4)	1.73(0.56-5.33)	1.72(0.46-6.40)	0.421

4.3.2 Socio-demographic Factors Associated with ENC practice

With respect to socio-demographic variables associated with practice of ENC, the bivariate analysis indicated that aged 40 years old who reached high education and those who had been working with newborns for more than three months showed adequate practice of ENC compared to those with less experience. However, none of the socio-demographic variables were found with significant association. Likewise, in the multivariate model, no significant relationship was observed. However, some variables were observed positively associated with adequate practice of ENC (Table 4). They included older age, 40 years and above [AOR=1.22; 95%CI: (0.34-4.34), P=0.761]; years of experience between one year and three years [AOR=1.56; 95%CI: (0.42-5.80), P=0.506]; and more than three years [AOR=2.61; 95%CI: (0.71-9.70), P=0.151] as presented in (Table 4).

Table 4: Socio-demographic Factors Associated with ENC practice (N=112)

Variables	N	Adequate practice of ENC; n(%)	Bivariate COR(95%CI)	Multivariate AOR(95%CI)	P-value
Age (years)					
20-29	21	11(52.4)	1.00	1.00	
30-39	55	30(54.5)	1.09(0.40-3.01)	0.82(0.23-2.90)	0.764
≥40	36	22(61.1)	1.43(0.48-4.30)	1.22(0.34-4.34)	0.761
Sex					
Male	20	13(65.0)	1.00	1.00	
Female	92	50(54.3)	0.64(0.23-1.77)	0.54(0.18-1.55)	0.251
Education level					
Certificate level	39	23(59.0)	1.00	1.00	
Diploma level	63	34(54.0)	0.82(0.36-1.84)	0.70(0.30-1.64)	0.413
Higher level	10	6(60.0)	1.04(0.25-4.37)	0.99(0.22-4.57)	0.995
Experience working with newborn					
<1 yr.	16	7(43.8)	1.00	1.00	
1-3 yrs.	35	18(51.4)	1.36(0.41-4.54)	1.56(0.42-5.80)	0.506
>3 yrs.	61	38(62.3)	2.12(0.68-6.61)	2.61(0.71-9.70)	0.151

4.4 Individual Factors Associated with Knowledge and practice of ENC
4.4.1 Individual Factors Associated with Knowledge of ENC

In bivariate analysis all individual factors had positive associations with adequate knowledge on ENC, except Nurse-Midwives who worked in newborn unit were (50%) less knowledgeable on ENC. [COR=0.50, 95%CI: (0.18-1.42)] In the multivariate analysis, individual factors showed statistical significant association with knowledge of ENC were Nurse-Midwives working in labour ward [AOR=4.11, 95%CI: (1.32-12.85) P=0.015] compared with postnatal ward; and Nurse-Midwives working in obstetrics theatre they had 3.11 times higher odds [AOR=3.11, 95%CI: (0.79-12.85), P=0.104] but was not statistically significant (Table5).

Table 5: Individual Factors Associated with Knowledge of ENC (N=112)

Variables	N	Adequate knowledge of ENC n (%)	Bivariate COR(95%CI)	Multivariate AOR(95%CI)	P-value
In which ward/unit do you provide ENC					
Postnatal ward	38	9(23.7)	1.00	1.00	
New-born ward/unit	27	19(70.4)	0.50(0.18-1.42)	2.14(0.74-6.19)	0.160
Labour ward	32	22(68.8)	2.20(0.80-6.02)	4.11(1.32-12.85)	0.015
OBS theatre	15	9(60.0)	1.50(0.44-5.13)	3.11(0.79-12.85)	0.104
Attended refresher course of ENC					
Yes	67	40(59.7)	2.03(0.93-4.43)	1.32(0.55-3.14)	0.533
No	45	19(42.2)	1.00	1.00	
On job training of ENC for past 2 years					
Yes	81	10(32.3)	3.22(1.30-7.98)	2.72(1.03-7.20)	0.044
No	31	49(60.5)	1.00		
Interest working with Newborn					
Yes	99	54(54.5)	1.92(0.58-6.36)	1.40(0.38-5.14)	0.612
No	13	5(38.5)	1.00		

4.4.2 Individual Factors Associated with ENC practice

Focusing on bivariate analysis, individual factors with statistical significant associated with ENC practice included on-job training in the past two years [COR=3.26; 95%CI: (1.33-8.01)], and adequate knowledge on ENC [COR=2.75, 95%CI: (1.24-6.10)]. Other factors including working experience with newborns, and attended refresher course also showed positive influence on ENC practice but the association was not statistically significant (Table 6). Considering multivariate analysis, only those who received on-job training in the past two years remained a significant factor associated with ENC practice [AOR=2.98, 95%CI: (1.10-8.15), P=0.031] as shown in (Table 6).

Table 6: Individual Factors Associated with ENC practice (N=112)

Variables	N	Adequate practice of ENC n (%)	Bivariate analysis COR(95%CI)	Multivariate analysis AOR(95%CI)	P-value
In which ward/unit do most often work					
Postnatal ward	38	18(47.4)	1.00	1.00	0.861
New-born ward/unit	27	13(48.1)	1.03(0.38-2.79)	0.91(0.32-2.60)	
Labour ward	32	21(65.6)	2.12(0.79-5.72)	1.65(0.53-5.15)	0.391
OBS theatre	15	11(73.3)	3.06(0.78-11.91)	2.31(0.53-5.10.00)	0.263
Attended refresher course of ENB					
Yes	67	39(58.2)	1.22(0.57-2.62)	0.73(0.29-1.80)	0.495
No	45	24(53.3)	1.00	1.00	
On job training in the past 2 years					
Yes	81	52(64.2)	3.26(1.33-8.01)	2.98(1.10-8.15)	0.031
No	31	11(35.5)	1.00	1.00	
Interest working with NBC					
Yes	99	56(56.6)	1.12(0.35-3.58)	0.84(0.23-3.09)	0.792
No	13	7(53.8)	1.00	1.00	
ENC knowledge					
Poor knowledge	53	23(43.4)	1.00	1.00	
Adequate knowledge	59	40(67.8)	2.75(1.24-6.10)	2.16(0.93-5.09)	0.072

4.5 Health Facility Factors Associated with Knowledge of ENC

4.5.1 Health facility Factors Associated with Knowledge of ENC

In the bivariate analysis, health facility factors that were significantly associated with knowledge of ENC included availability of ENC guidelines [COR=2.94; 95%CI: (1.30-6.60)], regular training on ENC [COR=3.31; 95%CI: (1.46-7.50)], influence from the facility [COR=3.37; 95%CI: (1.32-8.59)], shortage of staff [COR=2.52; 95%CI: (1.02-6.25)], and those with no negligence [COR=10.31; 95%CI: (1.15-92.31)]. Other factors including supply of ENC, workload, and facility were positively associated with knowledge on ENC but were not statistically significant (Table 7). Considering multivariate analysis, variables, which remained statistically, significantly associated with ENC knowledge included availability of guidelines for the ENC in the facility [AOR=11.69, 95%CI: (1.81-75.61), P=0.010] and regular training on ENC [AOR=4.04; 95%CI: (1.40-11.64), P=0.010] as shown in (Table 7).

Table 7: Health Facility Factors Associated with Knowledge of ENC (N=112)

Variables	N	Adequate knowledge of ENC n (%)	Bivariate analysis COR(95%CI)	Multivariate analysis AOR(95%CI)	P-value
Facility					
Temeke	43	23(53.5)	1.59(0.62-4.09)	0.62(0.17-2.22)	0.465
Amana	38	23(60.5)	2.12(0.79-5.71)	0.15(0.02-1.30)	0.085
Mwananyamala	31	13(41.9)	ref	ref	
Availability of ENC guidelines					
No	63	26(41.3)	**ref**	ref	
Yes	49	33(67.3)	2.94(1.30-6.60)	11.69(1.81-75.61)	0.010
Self-decision on newborn care					
No	58	26(44.8)	ref	ref	
Yes	54	33(61.1)	1.93(0.90-4.16)	1.29(0.48-3.48)	0.613
Work load					
No	20	14(70.0)	2.44(0.85-7.02)	2.51(0.71-8.86)	0.152
Yes	92	45(48.9)	ref	ref	
Supply for ENC					
Yes	93	53(57.0)	2.87(0.98-8.41)	2.93(0.73-11.81)	0.131
No	19	6(31.6)	ref	ref	
Trained on ENC					
Yes	53	36(67.9)	3.31(1.46-7.50)	4.04(1.40-11.64)	0.010
No	59	23(39.0)	ref	ref	
Influence from the facility on ENC					
Yes	83	50(60.2)	3.37(1.32-8.59)	1.64(0.54-5.03)	0.386
No	29	9(31.0)	ref	ref	
Shortage of staff					
Yes	84	49(58.3)	2.52(1.02-6.25)	0.44(0.11-1.73)	0.243
No	28	10(35.7)	ref	ref	
Negligence of ENC					
No	103	58(56.3)	10.31(1.1592.31)	15.51(0.76-317.56)	0.075
Yes	9	1(11.1)	ref	ref	

4.5.2 Health Facility Factors Associated with ENC practice

The bivariate analysis showed that health system factors that were associated with practice of ENC included availability of ENC guidelines, workload, self-decision on newborn care, supplies for ENC, ENC training, influence from the facility (internal supervision) and shortage of staff. However, only health facility showed statistical evidence of association, which was Temeke referral hospital that had 3.65 times higher odds of ENC practice than the other facilities [COR=3.65; 95%CI: (1.30-10.23)] (Table 8). The remaining health facility related factors did not show significant association of ENC practice.

After controlling all attributed factors, there was no statistical significance observed between health facility factors and ENC practice. However, some variables had higher odds of adequate practice than the others, particularly availability of ENC guidelines [AOR=3.78, 95%CI: (0.67-21.47), P=0.133] (Table 8). Findings from multivariate analysis indicated negative association with self-decision working with newborns [AOR=0.89; 95%CI: (0.36-2.20), P=0.806], influence from the facility [AOR=0.98, 95%CI: (0.34-2.90), P=0.999] and shortage of staff [AOR=0.75, 95%CI: (0.22-2.52), P=0.638] as presented in (Table 8).

Table 8: Health Facility Factors Associated with ENC practice (N=112)

Variables	N	Adequate practice of ENC n(%)	Bivariate analysis COR(95%CI)	Multivariate analysis AOR(95%CI)	P-value
Facility Name					
Temeke	43	30(69.8)	3.65(1.30-10.23)	2.13(0.68-6.70)	0.197
Amana	38	21(55.3)	1.96(0.73-5.24)	0.51(0.07-3.74)	0.506
Mwananyamala	31	12(38.7)	ref	ref	
Availability of ENC guidelines					
No	63	32(50.8)	ref	ref	
Yes	49	31(63.3)	1.67(0.77-3.61)	3.78(0.67-21.47)	0.133
Self-decision on newborn care					
No	58	30(51.7)	ref	ref	
Yes	54	33(61.1)	1.47(0.71-5.87)	0.89(0.36-2.20)	0.806
Work load					
No	20	14(70.0)	2.05(0.71-5.87)	2.16(0.66-7.08)	0.205
Yes	92	49(53.3)	ref	ref	
Supplies for ENC					
Yes	93	55(59.1)	2.00(0.70-5.49)	1.58(0.47-5.29)	0.454
No	19	8(42.1)	ref	ref	
Trained on ENC					
Yes	53	35(66.0)	2.15(0.99-4.70)	2.28(0.87-5.97)	0.093
No	59	28(47.5)	ref	ref	
Influence from the facility on ENC					
Yes	83	48(57.8)	1.28(0.55-3.01)	0.98(0.34-2.90)	0.999
No	29	15(51.7)	ref		
Shortage of staff					
Yes	84	49(58.3)	1.40(0.59-3.32)	0.75(0.22-2.52)	0.638
No	28	14(50.0)	ref		

4.6 Perceived Limiting Factors for the Essential Newborn Care Practice

The most identified limiting factors for ENC included; work load (82%) followed by lack of knowledge and training on ENC (53%) (Figure 4). Other noted limiting factors for ENC included; lack of influence from the facility such as supportive supervision on ENC from within the facility, shortage of staff, and lack of supplies like vitamin K, tetracycline 1% eye ointment and guideline for ENC. Also some reported that protocols for ENC were difficult to use (Figure 4).
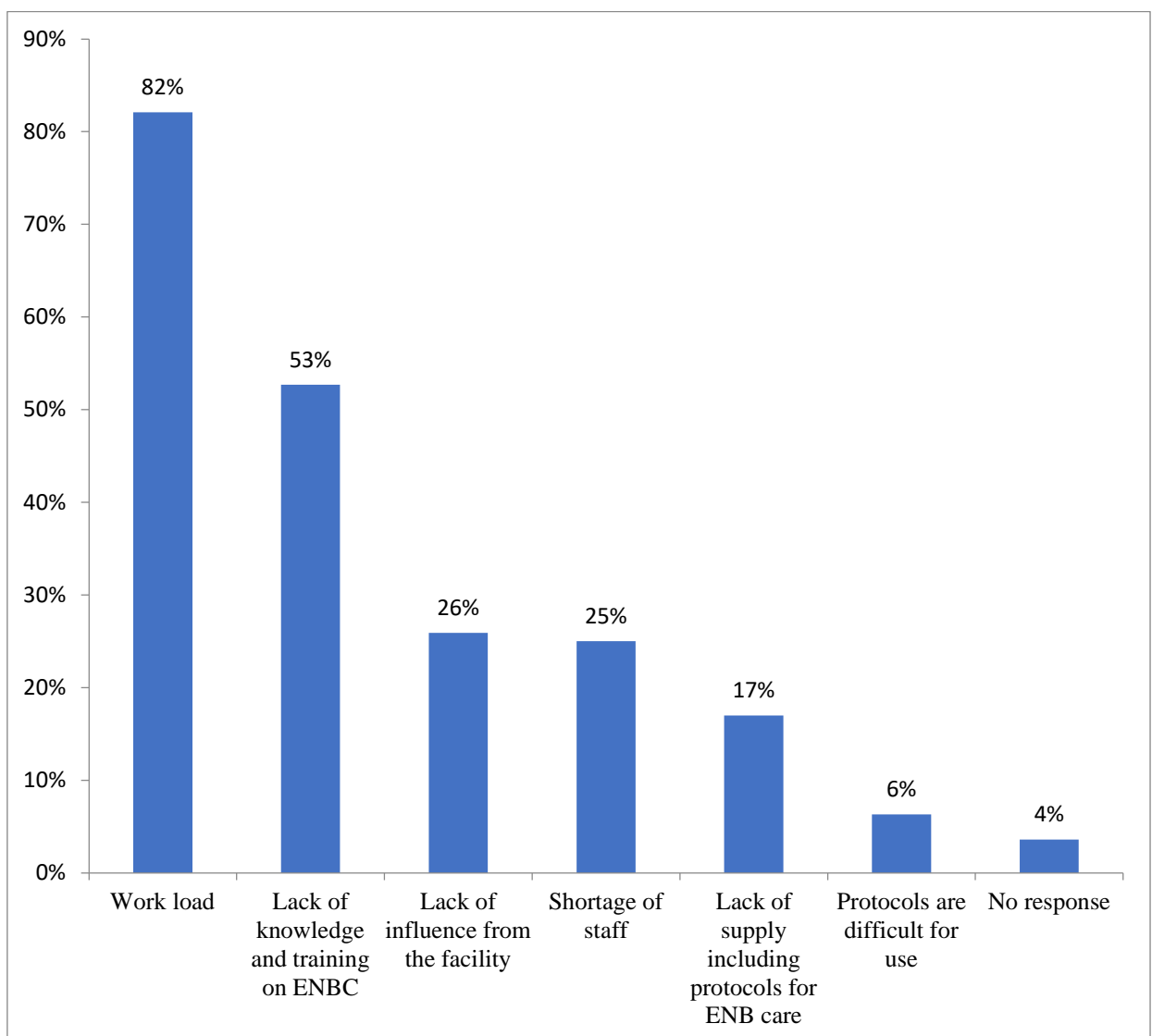

Figure 1: Perceived Limiting Factors for the Essential Newborn Care Practice

CHAPTER FIVE

5.0 DISCUSSION CONCLUSION AND RECOMMENDATIONS
5.1 INTRODUCTION

This chapter presents discussion of study findings on socio-demographic factors associated with knowledge and practice of essential newborn care among Nurses-Midwives. The next sub-section provides individual factors and lastly, health facility factors associated with knowledge and practice of essential newborn care among Nurses-Midwives at Amana, Mwananyamala and Temeke Regional Referral Hospitals. Understanding factors related to ENC can help on setting up interventions to strengthen knowledge and improve practice of ENC because ENC plays a great role in quality of care for newborns as well as reduction of neonatal morbidity and mortality.

5.2 Socio-demographic Factors Associated with Knowledge and Practice of ENC

According to results from this study, socio-demographic factors were not significantly associated with the Knowledge and Practice of ENC. However, there were positive associations with having greater age, being female, and having a higher level of educational qualifications. Also, those Nurses-Midwives who had equal or more than three years' experience in providing newborn care were 2.61 times more likely practicing ENC than those less experienced in newborn care. Results from this study are contradictory to the study from Jimma, Addis Ababa, Ethiopia in 2016, which found that educational qualifications were significantly associated with knowledge of health care providers on ENC (12). This discrepancy could be due to the nature of study participants who were involved in the study or it could be due to chance. But results from this study are similar to those from studies by Berhe and colleagues (2017); Shamba and co-workers (2014); Isangula and others (2018); and Tasew and colleagues (2019) who reported that education was a significant factor for the level of knowledge on ENC (8,10,15,16). This implies that socio-demographic factors with exception of education qualification have less contribution to knowledge and practice of essential newborn care.

5.3 Individual Factors Associated with Knowledge and Practice of ENC

Regarding individual factors associated with the knowledge and practice of ENC, it was found out that the working station of a Nurse-Midwives had an impact on the knowledge and practice of ENC. Those Nurse-Midwives who were mostly working in the labor ward and OBS theatre had adequate knowledge scores on ENC compared to those who were mostly working in the postnatal ward, and it was statistically significant. For the practice of ENC, it was found out that individuals on-job training were significantly associated with the adequate practice of ENC. Such results were similar to the findings from the study carried out in Indonesia by Sethi and co-workers (2018), which disclosed that in-service training on essential newborn care were predictors significantly associated with knowledge of health workers towards ENC (24). Such similarity could be due to the level of health facilities like referral and teaching health facilities, which are highly updated with ENC. Therefore, it implies that on-job training has an impact on increased knowledge and consistency to increased practice of essential newborn care.

Interest in working in maternity block has a great impact on understanding procedures and adherence to ENC. Thus, it is better to allow self-decision on choices for working in the maternity block rather than deciding for staff to do so when necessary. In this study, it was indicated that interest in working with newborns had an association with adequate knowledge on ENC but did not find a significant relationship. Corresponding with the recent study in Tanzania by Isangula and colleagues (2018), it was reported that Nurses-Midwives who had an interest in working in maternity units were more significantly associated with knowledge and practice on ENC than those with no interest (15). Such similarities could be due to the educational qualifications of participants under study. Another study in Tanzania by Mzurikwao and colleagues (2018) found out that individuals who were working in hospitals were more likely to have adequate knowledge of ENC than those who were working in health centers (26). However, this study was conducted in regional referral hospitals only, and thus, association with facility-level was not established.

5.4 Health Facility Factors Associated with Knowledge and Practice of ENC

The health facility system is the potential for strengthening the provision of ENC. Health facility factors encompassed availability of ENC guidelines, regular training of ENC, the influence of ENC from the facility (internal supportive supervision), and availability of ENC supplies.

The availability of ENC guidelines and regular training of ENC were significantly associated with knowledge of ENC but they were not significantly associated with the practice of ENC. Corresponding to the study in north-western zonal Tigray (2019), it was revealed that facilities, which had adequate supplies such as ENC guidelines were 4.69 times more likely to practice good ENC than others without ENC supplies (16). Results from this study are similar to the study in Ethiopia by Berhe and others (2016) who indicated that the availability of national guidelines for ENC was associated with an increase in the practice of ENC (8). These findings were inconsistent with the study in Vietnam where the availability of national guidelines was not associated with the provision of ENC (10). Such similarities and discrepancies could be due to chance or health facility type. Furthermore, the workload and training of ENC were found to have a significant association with the practice of ENC among health care providers (16).

However, this study showed that Nurses-Midwives at Amana hospital were positively associated with knowledge aspects of ENC compared to Temeke Hospital and Mwananyamala. On the other hand, Nurses-Midwives who were working at Temeke Hospital were positively associated with the adequate practice of ENC compared to Amana and Mwananyamala, but none of the latter were statistically significant. However such differences could be due to chance or socio-demographic characteristics of the study participants and the difference in the total number of Nurse-Midwives who provide newborn care at study cites, Temeke Hospital had a higher number of Nurse-Midwives compared to Amana and Mwananyala.

5.5 Conclusion

Generally Nurse-Midwives who participated in this study demonstrated knowledge and practice gap on ENC. This study, showed both socio-demographic, individual and health facility variables which were statistically associated with Knowledge and Practice of ENC. Greater age, being female Nurse-Midwife, adequate knowledge, influence from the facility, having experience of providing newborn care for three years and above and having higher level of education were statistically associated with knowledge and provision of ENC, though were not statistically significant. Availability of ENC guideline, regular on job training of ENC, and regular working in labour ward these variables were significantly associated with knowledge and practice of ENC.

However the tool used to collect data in this study was structured questionnaire only. Therefore the in-depth individual interview were not captured. Due to that reason, further qualitative studies of similar research are recommended in order to capture in-depth individual views. To ensure that ENC is effectively provided by Nurse-Midwives, Ministry of health in Tanzania in collaboration with health facility system in Dar es Salaam, should ensure availability and reliability of ENC guideline, and essential supplies (vitamin K supplement and tetracycline 1% eye ointment) for provision of ENC at health facility level. Besides, the said ministry may continue to insist on regular training to Nurse-Midwives on essential newborn care to improve knowledge and practice of ENC.

5.6. Limitations of the Study

This study was prone to social desirability of bias because of administering the questionnaire for data collection may have caused respondents to report for what they believed the researcher wanted to hear. To ensure that true answers were given, such bias was minimized through explanations to respondents that there were no acceptable or unacceptable responses.

Another limitation; this study was based on self-reported practice rather than observed practice towards on essential newborn care practices. Therefore a risk that Nurse-Midwives probably reported what were expected from them but their actual practice of essential newborn care may be different. However other interventional studies of similar research are recommended in order to come-up with the results that may be generalized in the whole country.

5.7 Recommendations

This study raised importance regarding factors associated with knowledge and practice of ENC among Nurses-Midwives at Amana, Mwananyamala and Temeke regional referral hospitals. Based on findings from this study, the researcher presents the following recommendations on three aspects, Clinical, Policy and further research.

5.7.1 Recommendations for Clinical Undertakings

Hospital management at Amana, Temeke and Mwananyamala Hospital

Since on-job training and availability of ENC guideline were significantly associated with knowledge and practice of ENC, therefore mmanagement of all 3 study cite need to put more emphasis on regular on-job training on ENC and ensure availability and reliability of ENC guidelines to improve the quality of ENC.

Also, hospital management may need to put additional efforts on internal supportive supervision on ENC with involvement of maternity and neonatal block managers. Again, the management should observe interest of Nurses-Midwives who are working in maternity block to be allocated in such establishments. For those who do not have interest in providing care to the newborns, it is better for the hospital leaders to exchange them with those with passion towards newborn care.

Midwives' Leaders at Amana, Temeke and Mwananyamala Hospital

Midwives leaders in collaboration with health management team in each hospital are recommended to be advocates of the newborns by ensuring availability of essential supplies for ENC such as Vitamin K and Tetracycline (TTCL) 1 percent eye ointment. They should not only ensure availability but also to make follow-up to ensure that every newborn will not exit from the hospital without receiving vitamin K and TTCL 1 percent eye ointment.

Nurse-Midwives' Amana, Temeke and Mwananyamala Hospital

It is recommended that Nurses-Midwives should be ready to update their knowledge through self-reading different articles and journals. Also, they should attend specific training on ENC in order to update their knowledge so as to improve practice of ENC.

5.7.2 Recommendation for Policy

Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) can use this piece of information to come up with a policy that will be useful on improving ENC according to standards in the preserved curriculum so that the graduates can be updated and can work without requiring refresher training, which is time-consuming as well as expensive.

5.7.3 Recommendation for Further Research

The study aimed to assess factors associated with knowledge and practice of ENC among Nurses-Midwives at Amana, Mwananyamala and Temeke regional hospitals in Dar es Salaam region. The tool used to collect data was the close-ended questionnaire only. Therefore, in-depth individual views were not captured. In due regard, further qualitative studies of similar research are recommended in order to capture in-depth individual views. Also this study was based on reported rather than observed practice towards on essential newborn care practices. However Nurse-Midwives probably reported what were expected from them but their actual practice of essential newborn care may be different. Therefore other interventional studies of similar research are recommended in order to come-up with the results that may be generalized in the whole country.

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APPENDICES

Appendix I: Informed Consent in English Version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

Consent to participate in a study titled, "Factors associated with practice of ENC among Nurse-Midwives at Amana, Mwananyamala, and Temeke in Dar Es Salaam region, Tanzania."

ID NO: HD/MUH/T.372/2018

Greetings! My name is HORTENSIA B TARIMO**.** Currently, I am a student at Muhimbili University of Health and Allied Sciences pursuing MSc in Midwifery and Women's Health. I am conducting research on the title: "Factors associated with practice of ENC among Nurse-Midwives in Dar es Salaam region, Tanzania."

The purpose of the study: The purpose of this study is to assess factors associated with practice of ENC among nurses-midwives who work at Amana, Temeke and Mwananyamala Hospitals in Dar es Salaam, Tanzania.

Sponsor: This study is sponsored by the Ministry of health, Tanzania.

Involved Participation: If you agree to participate in this study, I request you to answer questions concerning factors associated with practice of ENC among nurse midwives. The questions will take about 15 to 20 minutes.

Risk: The researcher anticipates that no harm will happen to you by participating in this study.

Confidentiality and Anonymity: Information that you will share in the questionnaire will be treated as strictly confidential and would be used only for research purpose and not for other reasons. Your name will not be used for identification during data analysis and report development. Instead, code number will be used. The researcher herself would not be able identify the name of participants who will provide the information.

Benefits: There is disturbance allowance on each participant for this study. Again, note that participation in this research has the potential for exploring factors associated with provision of ENC in Dar es Salaam region, Tanzania.

Rights to Withdraw and Alternatives. You are free to choose whether to participate or not or withdraw from this study at any time. Refusal to participate or withdraw will not imply any effect to your working area. However, we would like you to participate in this study because your views are very important for this study.

Whom to Contact: In case of any emergence concern, please contact the researcher through the following addresses: Hortensia B Tarimo, School of Nursing, MUHAS, P. O. BOX 65004, Dar es Salaam. Email address: siatarimo@yahoo.com. Mobile phone number +255754322052. OR you may consult the Director of Research and Publications, Dr. Bruno Sunguya using this number +2552221152467.

Agreement for participation

I have read and understood the purpose and procedure for this study. I am willing to participate in this study.

Participant's   signature………………………   Researcher's signature………………….................

Date…………………………………

Date……………………………………………...

Thank you for your participation**.**

APPENDIX II: QUESTIONNAIRE

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

SCHOOL OF NURSING, DEPARTMENT OF COMMUNITY HEALTH NURSING

FACTORS ASSOCIATED WITH KNOWLEDGE AND PRACTICES OF ESSENTIAL NEWBORN CARE AMONG NURSE MIDWIVES IN DAR ES SALAAM, TANZANIA.

Participants Code No _____

Name of the Facility: _____

Type of the facility: ☐ Private ☐ Government

Date of participation: ____/_____/_____ Time of participation: _____

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

(Circle the correct answer or fill in the blanks in each question identified)

1.1 Age of participant (years): _____

1.2 Sex: 1. Male   2. Female

1. 3 Education qualification: what is your highest education level?
   1. Certificate level
   2. Diploma level
   3. Advanced diploma level
   4. Bachelor degree level
   5. Master degree level
   6. Other (justify)

   _____

1.4 For how long have you worked with newborns in any facility? _____years ____ months

1.5 In which ward/unit do you most often work?
   1. Sick newborn ward/unit
   2. Newborn ward/unit
   3. Postnatal ward

4. Labor ward
5. OBS theatre
6. Other (specify): _____

1.6 Have you ever attended the refresher course of essential newborn care?

1. Yes

2. No

1.7 If yes in Q1.7, list the name and duration of the course you attended.

1. Course: _____

    Duration: _____

2. Course: _____

    Duration: _____

3. Course: _____

    Duration: _____

1.8 Other than training already mentioned, in the past 2 years, have you received any training through some formal mechanisms, such as in-service sessions, a conference setting, or structured mentoring?

1. Yes

2. No

1.9 Have you attended the following on-job training in the past three years?

1. Immediate care of the newborn after birth
2. Helping baby's breath
3. Counseling on general infant care for parents/care giver
4. Kangaroo mother care for the newborn
5. KMC with focus on low birth weight or preterm infants
6. Any aspect of breastfeeding/promotion of breast feeding/problem solving for breastfeeding for the newborn

1.10 How many Nurse-Midwives per shift? _____

1.11 How many deliveries/newborns are admitted per shift?

_____

SECTION B: KNOWLEDGE ON ESSENTIAL NEWBORN CARE

(**The following questions 2.1 through 2.11 are about your understanding on essential newborn care, kindly respond to these questions basing on your understanding).**

2. 1 What measures have to be taken if the baby is born not crying?

1. Cover the baby and allow skin-to-skin contact with the mother
2. Cover the baby with two *khanga* and put beside the mother
3. Put the baby on the newborns' table and finish to take care of the mother
4. Call for help while drying, change wet cloth and stimulate the baby and observe breathing.

2.2 The best position of the baby's head to allow airway opening is?

1. Slightly flexed
2. Slightly extended
3. Hyper extended
4. Hyper flexion

2.3 What measures have to be taken if the baby is not breathing after stimulation?

A. More stimulation to breath
B. Ventilation with bag and mask
C. Ventilation with bag and mask after one hour
D. Immediately perform deep suctioning of the nose and trachea while slapping on the back.

2.4 What is the normal breathing rate per minute of a newborn?

A. 30 – 60 breaths per minute
B. 30 - 40 breaths per minute
C. 40 – 60 breaths per minute
D. 40 - 80 breaths per minute

2.5 What is the right time to initiate breastfeeding after delivery?

A. After two hours

B. After transfer of the mother to postnatal ward

C. Within one hour after delivery

D. After birthing the mother and the newborn

2.6 What is the recommended right time of bathing a newborn?

    A. Within one hour after delivery

    B. Within half an hour with warm water to remove dirty blood

    C. 24 hours post-delivery or delayed at least six hours in case of cultural issues.

    D. After one month post-delivery to prevent cord sepsis.

2.7 What are the methods of thermo protection?

    A. Covering the newborn immediately with two *khanga* and keep the baby at the baby coat.

    B. Dry the newborn and give warm milk immediately

    C. Allow skin-to-skin contact with the mother after delivery

    D. Keep the baby beside her mother after delivery

2.8 Where are newborns supposed to be kept after delivery?

    A. At the newborns' bed or table

    B. With someone else while caring the mother

    C. Beside the mother

    D. On the mother's belly

2.9 What is the right dose of vitamin K for the full term newborn baby?

    A. 2 gm IM

    B. 1 mg IM

    C. 1 gm IM

    D. 1 mg I/V

2.10 What is the right dose of vitamin K for small or pre-term newborn babies?

    1. 0.5gm I/V

    2. 0.5mg IM

    3. 1.5mg IM

    4. 0.5mg I/V

2.11 What is the indication of administering vitamin K to the newborns?

    1. To increase body weight within one month

    2. To prevent infection within 1 hour post-delivery

3. To prevent severe bleeding within 7 days post-delivery

4. To prevent anemia of the newborn after 2 months

SECTION C: ESSENTIAL NEWBORN CARE PRACTICE QUESTIONS

Questions 24 to 36 are in order for assessing ENC practice among nurse-midwives, kindly ask the participant and do an observation. Otherwise, put a tick on the responses NO or YES for each question

3.0 Have you ever provided essential newborn care?

1. YES
2. NO (Skip Q 3.1 -3.16; otherwise go to section D)

3. Essential New-born Care

3.1 Do you immediately dry the baby by wiping face, head, trunk, back, arms and legs thoroughly and check breathing while drying?

YES   NO

3.2 Do you remove wet cloth to start skin-to-skin contact with mother?

YES   NO

3.3 Do you cover the baby with dry cloth and head with hat?

YES   NO

3.4 Do you continue skin-to-skin contact with the mother? If the baby is breathing well?

YES   NO

3.5 Do you separate the baby from the mother for at least 60 minutes?

YES   NO

3.6 Do you always observe the cord for signs of infection and bleeding?

YES   NO

3.7 Do you apply anything like Chlorhexidine or spirit in the cord stamp?

YES   NO

3.8 For the baby who born before arrival do you apply Chlorhexidine to the umbilical stump?

YES   NO

3.9   Do you initiate breastfeeding within 1 hour after delivery or when the baby shows feeding cues?

       YES   NO

3.10   Do you do eye care by administering TTCL 1 percent eye ointment within 90 minutes after delivery?

       Is it available?

       YES   NO

3.11   Do you monitor the baby every 15 minutes for the first 24 hours?

       YES   NO

3.12   Do you postpone bathing of the baby at least for 24 for hours after delivery?

       YES   NO

3.13   Do you examine the baby weight and record after checking body temperature?

       YES   NO

3.14   Do you provide vitamin K injection after checking body weight of the baby? Is it available?

       YES   NO

3.15   Do you provide routine re-examine of the baby before discharge?

       YES   NO

3.16   Do you counsel the mother to continue with ENC before discharge or after 24 hours of delivery?

       YES   NO

SECTION E: PERCEIVED FACTORS INFLUENCING ENC PRACTICES

4.1 Availability of ENC protocols/guidelines/job aids to help with providing essential newborn care

       1. Available and observed, what type: _____
       2. Available not observed, what type: _____
       3. Not available (Go to Q4.5)

4.2 Do you personally ever use any protocols/guidelines/job aids or other reference materials while providing essential newborn care?

    1. Yes, frequently

    2. Yes, sometimes

    3. No, Never use

4.3 If YES in question 4.2, what type of protocols/guidelines/job aids do you use frequently for newborn care?
    1. WHO guideline
    2. National guidelines
    3. Facility guidelines

    4.4 If NO in Q4.2 please, list few reasons.

_____

_____

_____

4.5 Do you have interest to work in labour ward, postnatal and neonatal unit?

    1. Yes

    2. No

4.6 Did you decide yourself to work in your current working unit?

    1. Yes

    2. No

4.7 Please circle all factors that limit you to provide ENC after delivery.

    1. Work load
    2. No guideline for ENC care
    3. Guidelines are difficult to use
    4. Not trained on essential new born care
    5. Lack of influence/supportive supervision from the facility
    6. Lack of on- job training on ENC
    7. Please list others if any

        _____

        _____
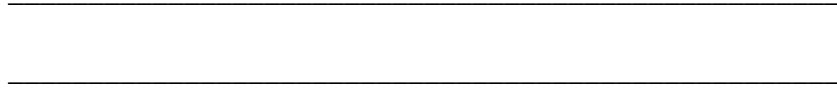
APPENDIX III: ETHICAL CLEARANCE

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. HD/MUH/T.372/2018

26th May, 2020

IRB#: MUHAS-REC-04-2020-267

Hortensia B. Tarimo,
MSc. Midwifery and Women's Health,
School of School of Nursing,
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "
        FACTORS ASSOCIATED WITH KNOWLEDGE AND PRACTICE OF ESSENTIAL
        NEWBORN CARE AMONG NURSE MIDWIVES AT AMANA, MWANANYAMALA
        AND TEMEKE HOSPITALS IN DAR ES SALAAM."

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 **26th May, 2020 to 25th May, 2021.** In case you do not complete data analysis and dissertation report writing by **25th May 2021,** you will have to apply for renewal of ethical clearance prior to the expiry date.

Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES
    Alex
    cc: Director of Research and Publications, **MUHAS**
    cc: Dean, School of Nursing, **MUHAS**

APPENDIX IV: RESEARCH PERMIT FOR SINZA HOSPITAL

UBUNGO MUNICIPAL COUNCIL
ALL CORRESPONDENCES TO BE ADDRESSED TO THE MUNICIPAL DIRECTOR

Tel: 0222-926341
Fax: 0222-926342

P. O. BOX 55068
DAR ES SALAAM.

In reply please quote:

DATE: 16/06/2020

Ref. AB.27/333/58

Hortensia B. Tarimo,
MUHAS,
DAR ES SALAAM.

RE: **RESEARCH PERMIT**

Refer to the above heading above.

I am pleased to inform you that your above request has been considered by the Municipal Director, and has offered you a place to collect data for your research on "**Factors associated with knowledge and practice of essential new-born care among nurse-midwives at Amana, Temeke, Sinza and Mwananyamala Hospitals in Dar es Salaam**" from **June, 2020** to **July, 2020**.

Upon receipt of this letter, please report to **Municipal Medical Officer of Health** for commencement of your research.

During the period of research, you are required to obey the rules and regulations of the institution as they will be defined by the supervisor of the Project.

Hoping to see you soon.

Y. C. Lwamlema
For: THE MUNICIPAL DIRECTOR
UBUNGO

Copy   Municipal Medical Officer of Health,
         Ubungo Municipal Council.

APPENDIX V: RESEARCH PERMIT-AMANA

UNITED REPUBLIC OF TANZANIA
MINISTRYOF HEALTH, COMMUNITY DEVELOPMENT, GENDER,
ELDER AND CHILDREN

DAR ES SALAAM REGION
ADDRESS: "HEALTH"
PHONE: 022 – 2861903

IN REPLY PLEASE QUOTE

REF. NO. MOHCDGEC/ARRH/R.I/XI/39

AMANA   REGIONAL   REFERRAL
HOSPITAL
P.O. BOX. 25411
DAR ES SALAAM.

12/6/2020

Muhimbili University of Health and Allied Sciences,

Office of the director of Postgraduate Studies

P.O. Box 65001

DAR-ES-SALAAM.

RE: PERMISSION TO CONDUCT RESEARCH AND COLLECT DATA

Refer to your letter which dated 11th March, 2020 which requested us to allow
Hortensia B. Tarimo to conduct research and collect data in our institution.

We are here to acknowledge your request with the following conditions, that he
must submit the results of her research after completion of analysis in order
the hospital to make use of the data's to solve hospital problems.

Regards.

Dr. Pili Kimanga
**FOR: MEDICAL OFFICER INCHARGE
AMANA REGIONAL REFERRAL HOSPITAL**

APPENDIX VI: RESEARCH PERMIT-TEMEKE

UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY
AND CHILDREN

DAR ES SALAAM REGIONAL

ADDRESS: Health'
TELL:Na: +255 -758 908110
fax Na:
Email: temekerh@afya.go.tz

Temeke Referral Hospital
P.O.; BOX 45232,
DAR ES SALAAM.

Tarehe 16/6/2020.

REF. NO TRRH/RSC/9/3/76.

NAME: HORTENSIA TARIMO
P.o. Box 65001
Institution MUHAS

RE: REQUEST FOR RESEARCH

Refer to the letter dated 26 MAY 2020 with Ref. No. HD/muH/T.372/2018.

From MUHAS:

I would like to inform you that your request for a research intends to do a study titled MIDWIVES ASSOCIATED WITH KNOWLEDGE AND PRACTICE OF ESSENTIAL NEWBORN CARE AMONG NURSE MIDWIVES AT TEMEKE DAR-ES-SALAAM is accepted

Furthermore, there is no financial obligation for this request and you should report to the head of NURSING AND MIDWIFES after receiving this latter for your study.

Also you should copy with rules, laws, regulations and order of Temeke Regional Referral Hospital for the period of your study.

Regards,

FOR: MEDICAL OFFICER INCHARGE
TEMEKE REGIONAL REFERRAL HOSPITAL

Copy to:
1. The Head of Department
   Research (Study).
   P.O. Box 65001
   INSTITUTION MUHAS.

2. Head of HER
   Temeke Regional Referral Hospital NURSING AND midwifes.
   Kindly assist for NURSING AND Research

APPENDIX VII: RESEARCH PERMIT-MWANANYAMALA

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

P.O. Box 65001
DAR ES SALAAM
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Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. HD/MUH/T.372//2018

10th June, 2020

Medical Officer in Charge,
Mwananyamala Regional Hospital,
P.O. Box 61665,
DAR ES SALAAM.

Re: **INTRODUCTION LETTER**

The bearer of this letter is Hortensia B. Tarimo, a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Midwifery and Women's Health.

As part of her studies she intends to do a study titled: **FACTORS ASSOCIATED WITH KNOWLEDGE AND PRACTICE OF ESSENTIAL NEWBORN CARE AMONG NURSE MIDWIVES AT AMANA, MWANANYAMALA AND TEMEKE HOSPITALS IN DAR ES SALAAM.**

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

Kindly provide her 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: Hortensia B. Tarimo