

**NEWBORN CORD CARE PRACTICES AND KNOWLEDGE AMONG  
POSTNATAL MOTHERS AT MOI TEACHING AND REFERRAL  
HOSPITAL, ELDORET, KENYA.**

**BY**

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## DECLARATION

### Declaration by the student

I declare that this thesis is my original work and has not been submitted to the university or any institution for academic purpose or otherwise.

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## **DEDICATION**

This thesis is dedicated to my beloved and devoted parents, my husband Luka, and our children Enoch and Abel for their encouragement throughout the years of my study. Though not endowed with much wealth, my parents valued education so much and so worked hard to educate us. Sadly, my parent's demise occurred before they reaped the fruits of their hard work. To my departed parents I say rest in peace.

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**ABBREVIATIONS**

<b>ANC</b>	Antenatal Clinic
<b>CEO</b>	Chief Executive Officer
<b>CPD</b>	Continuous Professional Development
<b>DSHW</b>	De Soysa Hospital for Women
<b>IQR</b>	Interquartile Range
<b>IREC</b>	Institutional Research and Ethics Committee
<b>KNH</b>	Kenyatta National Hospital
<b>LMIC</b>	Low and Middle Income Countries
<b>MCH</b>	Maternal and Child Health
<b>MTRH</b>	Moi Teaching and Referral Hospital
<b>PBT</b>	Planned Behavior Theory
<b>RA</b>	Research Assistant
<b>SSA</b>	Sub-Saharan Africa
<b>SD</b>	Standard Deviation
<b>WHO</b>	World Health Organization

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## ABSTRACT

**Introduction:** Neonatal period represents the most vulnerable time for child survival. Although improved cord care around the time of birth reduces the incidence of neonatal death, umbilical cord infections continue to cause a significant number of neonatal mortalities globally. To reduce these cord infections, the World Health Organization recommends that the umbilical cord be cleaned with chlorhexidine, or any other antiseptic solution. Despite these recommendations, diverse cord care practices, with some resulting in fatal infections have been reported in Asia, West and East African countries. The cord care practices in Moi Teaching and Referral Hospital (MTRH) have, however, not been clearly evaluated.

**Objective:** To evaluate newborn cord care practices, assess the level of knowledge and determine factors associated with cord care practices.

**Methods:** A cross-sectional descriptive study was done at (MTRH) among 114 conveniently sampled postnatal mothers attending child welfare clinic. A semi-structured researcher-administered questionnaire was pilot-tested and used for data collection. Data were analysed using Statistical Package for Social Sciences version 20. Descriptive statistics including mean, standard deviation and range were computed for continuous variables while frequencies were computed for categorical variables. Chi-square test was used to check for association between categorical variable and cord care practices.

**Results:** The study results showed that 73(64%) of the mothers used chlorhexidine on the cord, 9(8%) used surgical spirit while 17(14.9%) did not apply anything on the cord. Fourteen (12.9%) respondents applied either breast milk, saliva, soil, shea butter or ash on the baby's cord. Although most of the mothers (n = 94, 82.5%) were knowledgeable on cord cleaning and the need for hand hygiene during cord cleaning, some had inadequate knowledge on signs of umbilical cord infection. Mothers who attended four antenatal clinic visits were more likely to practice recommended cord care ( $\chi^2=16.02, p. = 0.03$ ).

**Conclusions:** Although most of the mothers used chlorhexidine for cord care, a significant number used substances considered harmful to the cord. Mothers had knowledge on cord cleaning and importance of hand hygiene, however, few did not know signs of an infected cord. Antenatal clinic visits were associated with better cord care practices.

**Recommendations:** Mothers should be encouraged to attend the recommended antenatal clinic visits where information on cord care is provided. Future observational studies should focus on documenting the actual cord care practices of mothers.

## **OPERATIONAL DEFINITION**

### **Appropriate Cord Care**

Taking care of the umbilical cord in accordance with the World Health Organization's recommendation.

### **Cord Care**

Specialized care of the remnants of a newborn's umbilical cord until it falls off, consisting of cleaning and precaution to prevent infection until the site is completely healed.

### **Knowledge**

Ability of the respondent to remember cord care practices

### **Newborn**

A human offspring from the time of birth through the 28<sup>th</sup> day of life (neonate).

### **Traditional Cord Care Practices**

Practices that are focused on the cultural beliefs and customs on how the umbilical cord was cared for including the substance that was applied

## CONCEPTUAL DEFINITION

### **Appropriate Cord Care**

Use of chlorhexidine 7.1% digluconate for umbilical cord care (WHO, 2014)

### **Cord Care**

Handling of the umbilical cord after birth (Walker et al., 1992)

### **Knowledge**

Knowledge is 'information given meaning and integrated with other contents of understanding' (Bates, 2005)

### **Newborn**

A child under 28 days of age (WHO, 2014)

### **Traditional Cord Care**

Cultural believes associated with handling of the umbilical cord (Herlihy et al., 2013)

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background Information

Neonatal period (the first 28 days of life) represents the most vulnerable time for child survival (World Health Organization, 2015). Although the World Health Organization (WHO) (2014) recommends use of chlorhexidine for cord care during the first week of life, traditional cord care practices, some of which are harmful with the potential to cause fatalities, have been observed in various parts of the globe and particularly in Sub Saharan Africa (SSA). Improved care around the time of birth reduces the incidence of neonatal death. According to Lawn and colleagues (2005), 4 million neonatal deaths occur globally each year. Approximately 99% of these deaths occur in low and middle income countries (LMIC) with SSA accounting for two thirds of the global neonatal mortality (Ganatra, Stoll & Zaidi, 2010; Lawn, Wilczynska-Ketende & Cousens, 2006). Kinney et al. (2010) noted that SSA bears two thirds of the burden of global newborn mortality. Liu et al. (2012) observes that two thirds of neonatal mortalities occur as a result of infections, including umbilical cord infection globally, regionally and nationally (The Lancet, 379 {9832}. 2151-2160). According to Lawn at al. (2014), approximately 6.1 million neonatal mortality in Asia and SSA are attributed to infections, including umbilical cord infections. United Nations Children's Fund (UNICEF) (2008) report indicates that sepsis from new born infections, including umbilical cord infection account for 15.8% of the newborn mortalities in Kenya as well as WHO (2015) which reported neonatal mortality of 6% attributed to neonatal sepsis. Numerous researchers have also noted that to reduce these neonatal mortalities, infection prevention and newborn care

including umbilical cord care need to be initiated immediately after birth and continued at home (Gale & Brooks, 2006; Kerber, 2007).

According to Saaka, Ali and Vuu (2018), similar to Pati et al. (2014) and Paudel, Shrestha and Rehfues (2013), diverse traditional cord care practices exist among mothers globally. Gatwala, Sharma and Bhakhri (2013) found that mothers are the primary newborn cord care givers with some of their cord care practices being harmful. Despite mothers being the primary cord care givers, numerous researchers have observed that most mothers have inadequate or poor knowledge on cord care (Begum & Khan, 2009; Osuchukwu, Ezerigbo & Eko, 2017). Sadly it is the mother's knowledge on cord care that informs their cord care practices and determines the overall outcome of the neonates. Msigna, Gebru and Birhamu (2016), also observes that some maternal socio-demographic characteristics such as level of education, parity and ethnicity may be significantly associated with outcomes of cord care.

## **1.2 Problem Statement**

Newborn deaths have remained a persistent challenge globally. Guerrero et al. (2015) found that an estimated 6.6 million children under five died from preventable diseases. Asim, Mahmood and Sohalil (2015) and Waiswa, Peterson, Tomson, and Pariyo (2010) reports indicated that many traditional practices exist in many communities worldwide and especially in developing countries. Numerous studies have cited infections, including umbilical cord infection as a major contributor to newborn morbidities and mortalities (Coffey & Brown, 2017; Liu et al., 2012; WHO, 2015; Lawn, 2014). Umbilical cord infection may originate from the practices of the primary care giver. Although World Health Organization (WHO, 2014) recommends use of chlorhexidine for cord care during the first week of life, traditional cord care

practices, some of which are harmful with the potential to cause fatalities, have been observed in various parts of the globe and particularly in SSA. The traditional cord care practices and the resultant infections are a health concern especially in SSA where two thirds of the global neonatal deaths occur (Kinney et al., 2010). Additionally, studies in Asia (Shrestha, Bhattarai & Silwal, 2013; Puriani, Patel, Gupta, Mehariya & Holda, 2015) and West Africa (Abhulimhen-lyoha & Ibadin, 2012; Monebenimp, Mongo, Chello, Foumame, Kamta & Kuaban, 2013) and few in East Africa (Kabwijamu et al., 2016) have reported varied levels of knowledge on cord care with most mothers citing friends and mothers-in-law as the main source of information on cord care.

Researchers have examined cord care practices at Kenyatta National Hospital (KNH) (Amolo, Irimu & Njai, 2017), Garissa (Kumola, 2015) and Meru Teaching and Referral Hospital (Mumbi, 2016). These Kenyan studies (Amolo et al., 2017; Kinanu et al., 2015) have evaluated cord care as part of postnatal care. Similarly, there is paucity of studies evaluating the level of knowledge on cord care among mothers in Kenya. Therefore, this study was intended to evaluate cord care practices and assess mothers' knowledge on cord care in an academic hospital in Western Kenya.

### **1.3 Study Questions**

The study was intended to answer the following questions.

1. What are cord care practices of postnatal mothers attending Child Welfare Clinic (CWC) at six weeks at Moi Teaching and Referral Hospital (MTRH)?
2. What is the level of knowledge on cord care among postnatal mothers attending CWC at six weeks at MTRH?
3. What are the factors associated with cord care practices and knowledge on cord care among postnatal mothers attending CWC at six weeks at MTRH?



### **1.3.1 Broad Objective**

The main objective of the study was to evaluate cord care practices among postnatal mothers attending CWC at six weeks at MTRH.

### **1.3.2 Specific Objective**

The specific objectives of the study were to:

1. Describe cord care practices of postnatal mothers attending CWC at six weeks at MTRH.
2. Assess the level of knowledge on cord care among postnatal mothers attending CWC at six weeks at MTRH.
3. Determine factors associated with cord care practices and knowledge on cord care among postnatal mothers attending CWC at six weeks at MTRH.

### **1.4 Assumptions of the Study**

The study was premised on the assumption that postnatal mothers attending CWC at six weeks at MTRH care for the cord as per WHO, (2014) recommendations. It was also assumed that postnatal mothers are given health education on cord care during antenatal and postnatal period and that chlorhexidine digluconate 7.1% or gel was available and offered to mothers to use for cord care at home. Furthermore, it was assumed that (a) postnatal mothers are shown how to use chlorhexidine for cord cleaning before discharge (b) health care providers initiate cord care in the presence of the mother and (c) mothers are informed of the importance of continuation of appropriate cord care at home for at least seven days.

### **1.5 Justification**

Studies have shown that newborn deaths remain high especially in LMIC. In Kenya 6% newborn deaths are due to neonatal sepsis resulting from infections, including umbilical cord infection (WHO, 2015). Although studies on cord care practice have been done in other hospitals in Kenya including KNH, Garissa, Pumwani and Meru Teaching and Referral Hospital, minimal studies have investigated cord care practices of postnatal mothers in Western Kenya. Even then, the Kenyan studies have evaluated cord care practices in the broad context of newborn care. Efforts to improve cord care practices in Kenya will require a comprehensive understanding of cord care practices, and factors associated with the cord care practices of mothers from diverse regions in the country.

### **1.6 Significance**

Newborn mortality has remained a persistent challenge particularly in SSA. It is anticipated that the results of the study will inform development of interventions to improve maternal cord care practices. The findings of the study will be used by hospital management and health care service providers to enhance theory and practice in service provision and health education to postnatal mothers on the recommended cord care practice. It is also anticipated that the study would inform health care providers' practices regarding initiation of cord care before discharge.

## **CHAPTER TWO**

### **LITRATURE REVIEW**

#### **2.0 Introduction**

The chapter reviews studies done on cord care practices, and knowledge of postnatal mothers regarding cord care, from a global, regional and local perspective. Similarly, theoretical and conceptual framework of the study will also be described.

#### **2.1 Cord Care Practices**

Although numerous evidence-based recommendations on cord care exist (WHO, 2014), many traditional practices continue to be reported in many communities worldwide and especially in developing countries (Asim, Mahmood & Sohalil, 2015; Waiswa, Peterson, Tomson, & Pariyo, 2010). Sadly, it is these developing countries that have the highest newborn death rates worldwide largely attributed to infections, including umbilical cord infection (Marsh et al., 2002; Bua, Paina, Kiracho, Mukaba & Fohl, 2015). The WHO (2014) recommends the use of chlorhexidine (7.1%) digluconate aqueous solution or gel as the standard cord care in health facilities and at home.

A Pakistan study involving 565 postnatal mothers found that ointment, ghee (saturated oil), coconut oil, mustard oil, surma (locally made kohl), clove oil, talcum were applied on the cord (Ayaz & Saleem, 2010). A similar finding was reported of a cross-sectional study of 170 mothers in an urban setting in the same country (Gul, Khalil, Yousafzai & Shoukat, 2014). A more comprehensive systemic review involving 65 articles in the same country found that purified oil, olive oil, surma (lead-based concoction), cow dung and ash were commonly used on the cord (Asim et al., 2015). Similarly, a qualitative study done among 566 postnatal mothers in the

same country found that the cord stump was kept clean and nothing was applied on it (Marsh et al., 2002).

A community based survey in Nepal (Sreeramareddy, Joshi, Sreekumaran, Giri & Chuni, 2006) found that mustard oil, turmeric and antiseptic were the main substances used by postnatal mothers for cord care. A similar finding was reported among 1,256 postnatal mothers in Bangladesh whereby boric powder, mustard oil with garlic, warm mustard oil, coconut oil, talcum, savlon or homeopathic medicine was applied onto cord (Moran et al., 2009).

Moyer, Abarigo, Logonia, Affah, Rominski, Adongo and English (2012) found that shea butter, ground nuts, local herbs, local oil, or “red earth sand” were the main substance used for cord care in rural areas of Northern Ghana. A study in Egypt, Darmstadt, Hussein, Winch, Haws, Lamina El-Said and Santosham (2008) reported that postnatal mothers applied alcohol and kohl (Locahhl eyeliner) onto cord during the first week of life.

In Eastern Uganda, Waiswa et al. (2010) found that powder, surgical spirit, salty water or lizard’s droppings were used for cord care while in Tanzania, Mrisho et al. (2008) reported use of powder ground from a local tree, ash, breast milk, on the cord stump. A Nigerian study reported similar distressing findings whereby harmful substances such as herbs, cow urine, tooth paste, hot palms, and chalk were applied on the newborn cord stump (Opara, Jaja, Dotimi and Alex-Hart, 2012). Similarly, in Ethiopia, Callaghan-Koru and associates (2013) reported the use of butter for cord care among postnatal mothers.

A qualitative study among breastfeeding mothers, grandmothers and traditional birth attendants in Zambia found that breast milk, (herbs powdered ), black powder from a pumpkin stem, green powder from the mweeye plant, pounded roots, prick ash, fresh dried chicken droppings were applied on the cord (Herlihy et al., 2013). A hospital-based study at Meru Teaching and Referral Hospital in Kenya found that postnatal mothers use surgical spirit for cord care (Mumbi, 2016).

## **2.2 Knowledge on Cord Care**

Sinha, Lal, Regmi and Pant (2013) reports that among 101 mothers with children less than 12 months in Nepal, 18.3% had knowledge on cord care. A similar study in the same country (Shrestha, Bhattarai, & Silwal, 2013) found that 31% of the 100 postnatal mothers were knowledgeable on cord cleaning and signs of cord infection. Furthermore, another study done in a tertiary care center in the same country (Yadav et al., 2016) found that 60% of the mothers interviewed had knowledge on cord cleaning, hand washing after diaper change, and signs of umbilical infection. Postnatal mothers in Columbia were also found to have knowledge of cord care; hand washing after diaper change and identification of signs of umbilical cord infection (Dayaratne & de Silva, 2016).

Researchers in India found that mothers had knowledge on cord care and signs of umbilical cord infection (Castalino, Nayak & D'souza, 2014; Purani, Patel, Gupta, Mehariya, & Holda, 2015). Other studies in the same country showed that 40-60% of the mothers were knowledgeable on cord care (Mandal & Ghosh, 2016; Pradan & Rani, 2017; Purani et al., 2015). An Iranian study found that rural women had knowledge on cord care, hand washing and signs of cord infection (Adib-Hajbahery & Khosrojerdi, 2017).

Within the African continent, inadequate knowledge of cord care was observed among mothers in South Sudan where only 18.2% of the 316 postnatal mothers in Juba Teaching Hospital had knowledge of cord care cleaning (Esmaeeli, 2013). Additionally, in the same country, another study found that mothers had some knowledge of cord care, hand washing and signs of umbilical infection (Mesekaa, Mungai & Musyoki, 2017).

Mothers in Nigeria reported to be keeping the cord dry suggesting that they had knowledge of cord care (Afolaranmi et al., 2018; Osuchukwu, Ezeruigbo & Eko, 2017). Another study in the same country (Udosen et al., 2019) showed that 83.5% of the 388 mothers were knowledgeable on cord cleaning. Within the same region, Ghanaian mothers were found to be knowledgeable on cord care, signs of umbilical infection and hand washing with a majority citing observation, friend, media and health care workers as source of information (Nutor et al., 2016).

A study done among adolescent mothers in Western Uganda showed that only 31% of the 410 participants had knowledge of cord care (Kabwijamu et al., 2016). Other studies in the same country reported less knowledge on cord care among mothers with less than half of the respondents being knowledgeable about cord care (Achora, 2010; Kayom, Kakuru, & Kiguli, 2015). Health care professionals, domiciliary health workers, mothers-in-law, and traditional birth attendance were cited as source of information on cord care in these Ugandan studies.

In Kenya, a study done among mothers of infants aged 3-28 days at Pumwani hospital, established that 54.5% of the 307 postnatal mothers had knowledge of cord care cleaning with most of the respondents citing health care workers, media and friends as source of information on cord care (Kinanu et al., 2015). Other researchers

in the same country reported that 37.9% of the 380 postnatal mothers in KNH knew that cord should be kept dry suggesting that they were knowledgeable about cord care (Amolo et al., 2017). These Kenyan studies were, however, not specific about cord care practices, rather the investigators evaluated the cord care practices in a broad context of newborn care.

### **2.3 Factors Associated with Cord Care Practices**

In India, Baqui et al. (2007) reported an association between maternal socio-demographic characteristic, antenatal clinic visits, and place of birth and cord care practice. More specifically, mothers with secondary level of education or higher reported better cord care practice (OR 1.3, 95% CI 1.2 - 1.5). A similar finding was reported in Bangladesh whereby having attained secondary level of education or higher was a good predictor of good cord care practice (OR 1.3, 95% CI 1.1, 1.9) (Shahjahan et al., 2012; Ahmed et al., 2019). Additionally, in the same country Ahmed et al. (2019) found a significant association between maternal age, level of education and occupation and knowledge of cord care ( $P = 0.001$ ).

In Himalayas, Singh et al. (2019) reported an association between the number of children and ANC visits and knowledge on cord care. Mothers who had one previous child were reported to have had inadequate knowledge than those with more than one previous child (AOR = 2.65, 95% CI 1.26 - 5.56 vs AOR = 2.27, 95% CI 0.92 - 5.59). The same study showed that mothers who had four ANC visits were more knowledgeable about cord care (AOR 2.89, 95% CI 1.04 - 7). In Nigeria it was noted that delivery in a health facility was a good predictor of good cord care (adj. OR = 7.0; 95% CI 4.7877-9.3948;  $p < 0.001$ ) (Afolaranmi et al., 2018). Similarly, Bwalya et al. (2017) found that a less proportion of mothers in Zambia with primary

education (8%) initiated cord care within 48 hours compared to 15% of mothers with secondary education. Additionally, mothers who had four and more ANC visits had 60% higher Odds of reported good cord care practice than those with fewer visits. Furthermore, a higher proportion of mothers who gave birth at a health facility (19%) practiced the recommended cord care compared to 8% of mothers who had home births (Bwalya et al., 2017). Asiegbu et al. (2019) found an association between level of education and knowledge of cord care; mothers with tertiary level of education were found to have knowledge on cord care (51.72%) ( $P = 0.025$ ) in Nigeria.

In Ethiopia Msigna, Gebru and Birhamu (2016) reported no association between mother's age, level of education, marital status, parity and ANC visits and cord care practices. Occupation (employed versus unemployed; [OR (95 % CI) 9.97; (2.27, 38.6)] and knowledge (knowledge about cord care versus not knowledgeable; [OR (95% CI) 5.63; (1.99, 15.89)] were associated with better cord care practice (Msigna et al., 2016). Another study in the same country found an association between mothers' level of education and knowledge on cord care. More specifically, mothers with primary education [AOR = 4.044, 95% CI (1,789, 9.142)], secondary level of education [AOR = 2.465, 95% CI (1.175, 5.173)] and those with tertiary education [AOR = 2.301, 95% CI (1.114, 4.752)] were found to be more knowledgeable on cord care (Kebede, 2019).

Furthermore, other Ethiopian researchers found an association between employment, parity and antenatal clinic visits and knowledge on cord care. Mothers who were unemployed, those with no previous child and those who reported less than four antenatal clinic visits in the last pregnancy were found to have inadequate



knowledge AOR = 2.10, 95% CI: (1.25, 3.20); AOR = 1.99, 95% CI: (1.25, 3.20); AOR = 0.63, 95% CI: (0.4, 0.99) (Berhan & Gulama, 2018).

In Uganda, Owor et al. (2016) reported a negative association between cord care practices and (a) having primary education ( $p = 0.002$ ), (b) being a laborer, ( $p = 0.028$ ), (c) and attending 1<sup>st</sup> ANC visit during the 2<sup>nd</sup> trimester ( $p = 0.047$ ). Conversely, mothers who had secondary level of education or higher ( $p = 0.03$ ), those who had 3-5 children ( $p < 0.001$ ), and those that delivered with a birth assistant ( $p = 0.03$ ) reported better cord care practices. Additionally, good cord care practices were reported among mothers who (a) had more ANC visits (3-4 versus 1-2; Adj. OR 1.69, 95% CI 1.13, 2.25), (b) were assisted by a birth attendant (Adj. OR 2.66, 95% CI 1.92, 3.69), and were employed (OR 1.57, 95% CI 1.09, 2.26).

## **2.4 Theoretical Framework**

The researcher used the Planned Behavior Theory (PBT) developed by (Ajzen, 1991). The theory posits that attitude towards behavior, predicts human behavior. The theory stands on three constructs; behavioral intention, attitude towards behavior, and subjective norm. The theory assumes that intention can explain attitude manifested in opinion of oneself about the behavior and subjective form through opinion of others about the behavior and also perceived behavioral control by self-efficacy towards the behavior (Ajzen, 1991).

### **Behavioral Intention**

The stronger the intention to engage in a behavior, the more likely to carry out the behavior (Ajzen, 1991).

### Attitude towards the behavior

Extend of a person having unfavorable or appraisal of a given behavior.

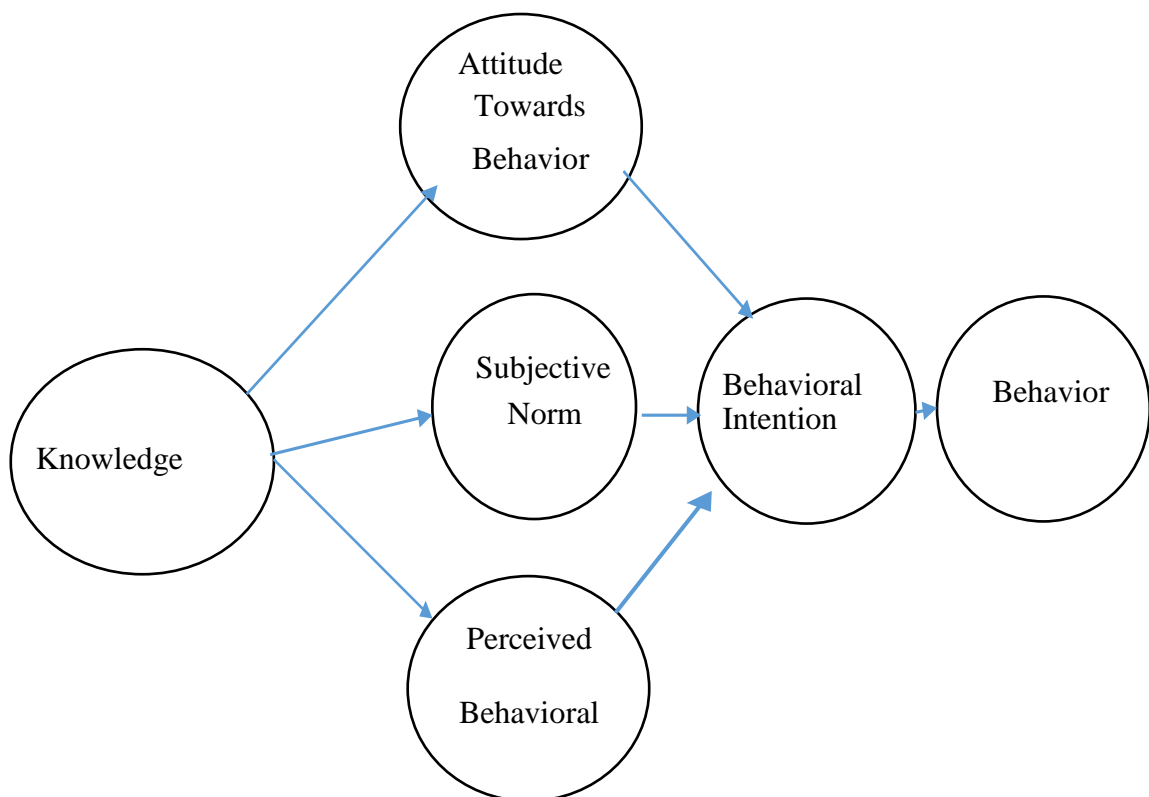
Attitude consists of behavior, beliefs and outcomes (Ajzen, 1991).

### Subjective form

This is a social pressure to perform or not to perform a given behavior.

According to the model, attitude, subjective norm and perceived behavioral control predicts the intention, which in turn predicts the behavior, and attitude consisting of behavioral beliefs and outcomes. Background variables such as demographics are likely to influence the three constructs. Behavioral intention signifies factors that influence behavior (Ajzen, 1991).

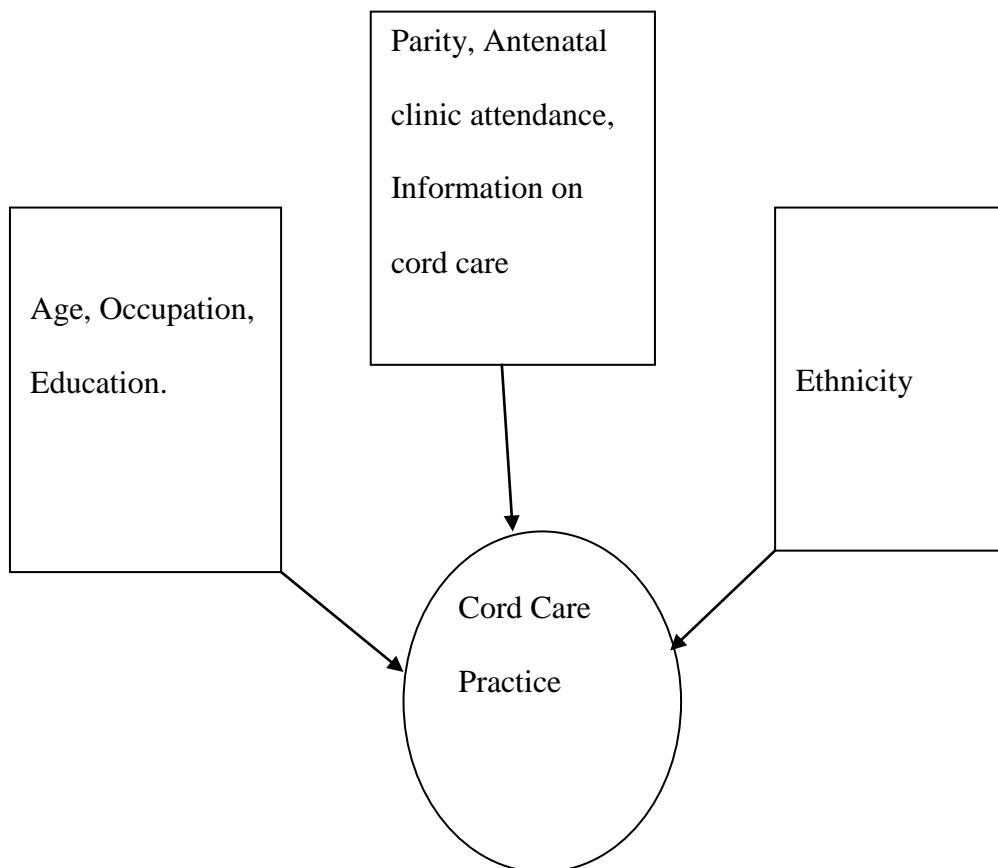
The researcher used the PBT to be able to assess the mother's knowledge on cord care.



**Figure 1:** Planned Behavior Theory; Adapted from (Ajzen, 1991)

## 2.5 Conceptual Framework

The researcher developed the conceptual framework to associate the variables in the study. The independent variables in the study included age, level of education, knowledge, parity, ANC attendance, information given on cord care while attending ANC visits and ethnicity. The dependent variable was cord care practice. The independent variables were used to indicate association with cord care practice.



**Figure 2:** Conceptual framework on Cord Care

## CHAPTER THREE

### METHODS

#### 3.0 Introduction

This chapter describes the research methods that were used to achieve the objectives of the study. The study design, setting, population, sampling technique, study instrument, data collection procedures and analysis, and ethical consideration are described.

#### 3.1 Study Design

A cross-sectional descriptive design was adapted for the study. Cross-sectional studies are used on disease prevalence, behaviors, intentions, knowledge, attitudes and opinions involving data collection at one point in time (Polit & Becks, 2009). The researcher utilized descriptive design to enable description of cord care practices, assessment of knowledge and identification of factors associated with among mothers attending CWC at six weeks at MTRH an academic hospital in Western Kenya.

#### 3.2 Study Site

The study was conducted at MTRH, situated in Ainabkoi sub-county, Uasin Gishu County, Eldoret, Kenya. The hospital serves as a referral facility for Western Kenya, parts of Eastern Uganda and South Sudan. Approximately eight hundred and fifty seven mothers give birth at MTRH and about 160 newborn babies are seen at the CWC at the age of six weeks monthly.

#### 3.3 Study Population

The study population comprised of postnatal mothers bringing their newborn babies for CWC follow up at six weeks at the hospital.

### 3.4 Sample Size

Gay (2003) recommends that when the target population is small (less than a 1000), a minimal sample size is adequate for educational research. The researcher calculated sample size according to Yamane (1992) formula.

$$(n=N/1+Ne^2).$$

Where; n = the sample size

N = the size of population

E = the error of 5 percent

$$n = N/1+Ne^2 \quad n=N/1+0.4$$

$$n = 160/1.4$$

$$= 114$$

The sample size, therefore, comprised of 114 postnatal mothers.

### 3.5 Sampling Technique

Purposive convenience sampling was used to recruit postnatal mothers who participated in the study. The technique was selected because it enabled the researcher to recruit mothers anticipated to have information on cord care. The researcher used CWC register and clinic cards to identify babies being brought for follow up at the age of six weeks so as to enroll their mothers to the study. Mothers were approached and given information about the study before being recruited into the study.

### **3.6 Eligibility Criteria**

#### **3.6.1 Inclusion criteria**

All postnatal mothers attending CWC at six weeks were eligible to be included in the study. Mothers who consented to participate in the study were interviewed.

#### **3.6.2 Exclusion criteria**

Postnatal mothers whose babies were unwell and required treatment were excluded from the study. Additionally, mothers who were mentally unstable and those who were sick and needed medical treatment were not included in the study.

### **3.7 Data Collection Tool**

The researcher utilized a semi-structured interviewer-administered pre-tested questionnaire to collect data. A questionnaire that was used in a similar study in KNH (Amolo et al., 2017) was adopted and modified for data collection. The data collection instrument had questions on demographic characteristics (12 questions), cord care practice (9 questions) and knowledge on cord care (10 questions) (Appendix II). Modification was done by adding some questions to the tool e.g.; who initiated cord care, were you shown how to care for the cord (Section on cord care) and were you given information on cord care after the birth of the baby, if the umbilical cord is infected, the baby's body may feel hot (Knowledge). The questionnaire consisted of 10 items on knowledge. Five open ended questions were used to determine information given to the mother during ANC visits and postnatal period on cord care and the source of that information. A four-point likert scale (1 strongly agree, 2 agree, 3 disagree and 4 strongly disagree) were used to assess level of knowledge on source of infection and signs of umbilical infection. Five of the likert scale questions were

formulated so that an affirmative response (strongly agree and agree) would denote knowledge on the item question. The final questionnaire was reviewed by the university supervisors for content.

### **3.8 Pilot Study**

A pilot study was conducted among eleven (10% of the sample size) postnatal mothers at the study site a week prior to commencement of the main study. The aim of the pilot study was to establish whether the questions were well defined, presented in a consistent manner and whether the questions were comprehensible to the respondents. Combined items were used to provide quantitative measure of knowledge. No major revisions were made to the data collection tool after the pilot study.

### **3.9 Data Collection Procedure**

Data collection took place between November 2018 and February 2019. The principal investigator recruited and trained a nurse intern to serve as a research assistant (RA) for the study. The RA was trained on how to (a) establish rapport with the mother and obtain consent, (b) maintain confidentiality of data and (c) address respondent's concerns.

On the morning of the first day of data collection, the researcher and the assistant introduced themselves to the in-charge of the CWC and handed in the letter of permission, from the Chief Executive Officer (CEO) of the hospital (Appendix VI), to collect data. Consequently, the researcher and the RA introduced themselves to the staff working at CWC and familiarized themselves with the working environment, client flow and registration. The researcher or RA used CWC register and clinic cards to identify babies being brought for follow up at the age of six weeks so as to enroll their mothers who met the inclusion criteria in to the study. Once a mother who had

met the inclusion criteria was identified, the researcher or the RA introduced herself to the participant and explained in details about the study. Consequently, written consent (in English or Kiswahili) (Appendix I) was obtained from respondents who were willing to participate in the study. After obtaining the consent, the researcher or the RA proceeded to administer the questionnaire to the respondent at an isolated corner in the waiting bay. After the respondent had answered the questions, the interviewer verified whether all the questions have been answered correctly, appreciated and dismissed the interviewee.

### **3.10 Data Management and Analysis**

Data collected were coded then entered into Statistical Package for Social Sciences (SPSS) software version 20. Data were cleaned and analyzed descriptively into mean, standard deviation, median and interquartile range for continuous data. Chi-square test was used to check for association between categorical data and cord care. Independent sample t-test was used to compare means for continuous data while Fisher's exact test was used to identify factors associated with cord care. Chi-square test was done to determine association between maternal characteristics and knowledge on cord care. Likert scale data were combined into a single composite score for descriptive analysis (Behnke & Kelly, 2011). Means and standard deviations were computed for the composite score of the Likert scale data.

### **3.11 Ethical Consideration**

Approval to conduct the study was sought from Moi University College of Health Science's and MTRH's Institutional Research and Ethics Committee (IREC) (Appendix V). Permission to carry out the research was sought from the chief executive officer (CEO) of the hospital and a written consent was obtained from the respondents. Participation in the study was voluntary; respondents were made aware



that they could withdraw or decline to answer any question without any victimization. To guarantee privacy of respondents, no identifiable information (e.g. mother's name) was collected. Respondents were also assured that data collected would only be (a) used for purposes of the study and (b) accessible to the researcher and her supervisors.

### **3.12 Data Dissemination**

The results of the study will be presented in continuous professional development (CPD) sessions in the study hospital as well as in the county hospitals. To facilitate adaption of the study recommendations by the local government (Uasin Gishu County), a copy of the study report will be submitted to the county government. Findings will also be presented in scientific conferences through posters and oral presentations. To reach the wider community of practice globally, the work will be published in peer-reviewed journals

### **3.14 Limitations**

Although the study yielded interesting findings, a number of factors may limit the quality of the results. The sampling technique used in the study may have left out some mothers with information different from the recruited respondents thus limit the generalizability of the study result. Similarly, the use of a researcher-administered questionnaire for data collection may have prompted mothers to respond to the questions based on what they thought the researcher wanted to hear thus introducing the risk of social desirability bias.

## CHAPTER FOUR

### FINDINGS

#### 4.0 Introduction

The chapter provides a summary of the study results. First we provide a summary of the socio-demographic characteristics of the respondents followed by results as per study objectives.

#### 4.1 Socio Demographic Characteristics

A total of 114 mothers participated in the study. The mothers' age ranged from 18 to 41 years with a mean of 27 years (SD = 4.7). Majority of the mothers (93%; n = 106) were married and only 8 (7%) were single. Majority of the respondents (56.1%; n = 64) had attained tertiary level of education with a few (19.3%; n = 22) having attained primary education. Most of the respondents (38.6%; n = 42) were unemployed and a significant number had none or one previous birth (73.7%; n = 84).

A majority of the mothers (89.5%; n = 102) had attended four or more ANC visits during their previous pregnancy with the rest (10.5%; n = 12) having attended three ANC visits. Hundred and two (89.5%) of the respondents delivered at MTRH with most of them (56.1%; n = 64) having been assisted by a nurse during birth. Most of the respondents belonged to the Kalenjin ethnic group (See table 1 for summary on demographic characteristics of the respondents).

**Table 1: Socio-demographic Characteristics of Respondents (N=114)**

<b>Variable</b>	<b>Freq.</b>	<b>Percentage</b> <b>(%)</b>	<b>Mean</b>	<b>SD</b>	<b>Median</b>	<b>IQR</b>	<b>Min.</b>	<b>Max.</b>
<b>Age (yrs.)</b>			27	4.7			18	41
<b>No. of children</b>			0.98	1.07	1	0,2	0	4
<b>ANC visits</b>			4.5	0.9			3	7
<b>Marital status</b>								
Married	106	93.0						
Single	8	7						
<b>Level of Education</b>								
Primary	22	19.3						
Secondary	28	24.6						
Tertiary	64	56.1						
<b>Occupation</b>								
Employed	42	36.8						
Unemployed	44	38.6						
Housewife	28	24.6						
<b>1<sup>st</sup> ANC</b>								
1 <sup>st</sup> trimester	54	47.3						
2 <sup>nd</sup> trimester	60	52.6						

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<b>Place of birth</b>		
MTRH	102	89.5
County hospital	6	5.3
Sub-county hospital	6	5.3
<b>Birth assistant</b>		
Nurse	64	56.1
Doctor	50	43.9
<b>Ethnicity</b>		
Kalenjin	43	37.7
Kikuyu	32	28.0
Luhya	16	14.0
Luo	8	7.0
Kisii	7	6.1
Others	8	6.5

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Abbreviations: SD; Standard Deviation; IQR: Interquartile Range

## 4.2 Cord Care Practices

The study results revealed that seventy three (64%) of the mothers used chlorhexidine on the cord, nine (8%) used surgical spirit while seventeen (14.9%) did not apply anything on the cord. Sixty four respondents (56.1%) applied the substance twice a day with sixty nine (61%) of the mothers having initiated the care. Only three of the Kalenjin respondents (6.9%) used breast milk while six of the Kikuyu mothers (18.7%) used saliva for cord care. A substantial number of the mothers (80%; n = 91) reported that they applied the diaper below the umbilicus while 78% (n = 89) wiped the baby during bath (Table 2).

**Table 2: Cord Care Practices (N= 113)**

<b>Variables</b>	<b>Frequency</b>	<b>%</b>
<b>Taking care of the cord</b>		
Uncover	83	73
Cover	20	18
Apply surgical spirit	10	9
No substance applied	1	0.9
<b>Substance on cord stump*</b>		
Chlorhexidine	73	64.0
Surgical spirit	9	8
Saliva	6	5.2
Breast milk	4	3.5
Ash	2	1.7
Shea butter	1	0.9
Soil	1	0.9
No substance applied	17	14.9
<b>Frequency of application of substance</b>		
1	17	15
2	64	56.1
3	15	13.2
5	1	0.9
<b>Application of diaper</b>		
Below umbilicus	91	80
Above umbilicus	23	20.3
<b>Initiator of cord care</b>		
Self	69	61
Nurse	14	12.3
Others	11	10
Care taker	3	2.6
Doctor	2	1.8
No response	15	13.2
<b>Shown how to care for the cord</b>		
Yes	33	29
No	81	71.1
<b>Provided with substance</b>		
Yes	79	69.3
No	35	31
<b>Care of the cord during bath</b>		
Wiped	89	78.1
Immersed in water	25	22

*\*One mother did not respond to the question*

### **4.3 Knowledge on Cord Care**

A majority of the mothers strongly agreed that contaminated hands may become source of umbilical infection, however, few strongly disagreed that the baby may present with hotness of the body when umbilical cord is infected. Table 3 describes mothers' knowledge on cord care

**Table 3: Knowledge on Cord Care (N=114)**

<b>Statement</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
Contaminated hands may cause umbilical infection	54	50	5	5
Dirty cord may become infected	61	46	4	3
Signs of umbilical cord infection	36	58	12	8
Infected stump may discharge pus	49	55	5	5
Infected cord may cause hotness of the body	40	50	9	15



#### 4.4: Factors Associated with Cord Care Practices

The study established that antenatal clinic visits were associated with cord care practices.

Mothers who attended four or more ANC visits were more likely to practice the recommended cord care ( $\chi^2=16.02$ ,  $p. = 0.03$ ) (Table 4).

**Table 4: Factors Associated with Cord Care Practices (N=114)**

Variable	Appropriate cord care		p-value
	No	Yes	
<b>Age (yrs.)</b>	27.5 (0.92)	26.1 (0.49)	0.14 <sup>1</sup>
<b>Marital status</b>			0.49 <sup>3</sup>
Married	28 (26.4)	78 (73.4)	
Single	3 (37.5)	5 (62.5)	
<b>Level of education</b>			0.43 <sup>2</sup>
Primary	7(31.8)	15(68.2)	
Secondary	5 (17.9)	23 (82.1)	
Tertiary	19(29.7)	45(70.3)	
<b>Occupation</b>			0.89 <sup>2</sup>
Employed	11 (26.2)	31 (73.8)	
Unemployed	13 (29.5)	31 (70.5)	
Housewife	7 (25)	21 (75)	
<b>Number of children</b>			0.234 <sup>3</sup>
0	11 (22.9)	37 (77.1)	
1	7 (19.4)	29 (80.6)	
2	7 (43.8)	9 (56.3)	
3	5 (41.7)	7 (58.3)	
4	1 (50)	1 (50)	
<b>ANC visits</b>			0.03 <sup>3</sup>
3	7 (58.3)	5 (42.7)	
4	12 (23.1)	40 (76.9)	
5	4 (13.5)	28 (87.5)	
6	6 (37.5)	10 (62.5)	
7	2 (100)	0 (0)	
<b>1<sup>st</sup> ANC visit</b>			0.89 <sup>2</sup>
1 <sup>st</sup> trimester	15 (27.8)	39 (72.2)	
2 <sup>nd</sup> trimester	16 (26.7)	44 (73.3)	
<b>Health facility of birth</b>			0.24 <sup>3</sup>
MTRH	30 (29.4)	72 (70.6)	
County	0 (0)	6 (100)	
Sub county	1 (16.7)	5 (83.3)	
<b>Birth Assistant</b>			0.86 <sup>2</sup>
Nurse	17 (26.6)	47 (73.4)	
Doctor	14 (28)	36 (72)	

<sup>1</sup>t-test

<sup>2</sup>Chi-square

<sup>3</sup>Fishers' exact test

#### 4.5: Factors Associated with Knowledge on Cord Care

Neither was age, marital status, level of education, occupation, nor the number of children the respondent had was associated with knowledge of cord care (Table 5).

**Table 5: Factors Associated with Knowledge on Cord Care. (N=114)**

Variable	Knowledgeable		p-value
	No Frequency (%)	Yes Frequency (%)	
<b>Age (yrs.)</b>	27 (5.7)	27 (4.5)	0.87 <sup>1</sup>
<b>Marital status</b>			0.56 <sup>3</sup>
Married	18 (17)	88 (83)	
Single	2 (25)	6 (75)	
<b>Level of education</b>			0.18 <sup>3</sup>
Primary	1(4.5)	21(95.5)	
Secondary	5 (17.9)	23 (82.1)	
Tertiary	14(21.9)	50(78.1)	
<b>Occupation</b>			0.51 <sup>3</sup>
Employed	9 (21.4)	33 (78.6)	
Unemployed	8 (18.2)	36 (81.8)	
Housewife	3 (10.7)	25 (89.3)	
<b>Number of children</b>			0.63 <sup>3</sup>
0	9 (18.8)	39 (81.3)	
1	4 (11.1)	32 (88.9)	
2	4 (25)	12 (75)	
3	3 (25)	9 (75)	
4	0 (0)	2 (100)	
<b>ANC visits</b>			0.38 <sup>3</sup>
3	1 (8.3)	11 (91.7)	
4	7 (13.5)	45 (86.5)	
5	7 (21.9)	25 (78.1)	
6	5 (31.3)	11 (69)	
7	0 (0)	2 (100)	
<b>1<sup>st</sup> ANC visit</b>			0.81 <sup>2</sup>
1 <sup>st</sup> trimester	9 (16.6)	45 (83.3)	
2 <sup>nd</sup> trimester	11 (18.3)	49 (81.6)	
<b>Health facility of birth</b>			0.32 <sup>3</sup>
MTRH	18 (17.6)	84 (82.4)	
County	2 (33.3)	4 (66.7)	
Sub county	0 (0)	6 (100)	
<b>Birth Assistant</b>			0.70 <sup>2</sup>
Nurse	12 (18.8)	52 (81.3)	
Doctor	8(16)	42(84)	

<sup>1</sup>t-test    <sup>2</sup>Chi-square    <sup>3</sup>Fishers' exact test

## CHAPTER FIVE

### DISCUSSION

#### 5.0 Introduction

The chapter discusses the major findings of the study in relation to other empirical work. The chapter is organized into four sections namely cord care practices, level of knowledge on cord care, factors associated with cord care practices and factors associated with knowledge on cord care.

#### 5.1 Cord Care Practices

Generally, mothers are expected to leave the cord stump uncovered and/or apply chlorhexidine. Furthermore, mothers are expected to apply the diaper below the umbilical stump, only wipe the baby during bath, and to clean a soiled cord with plain water (Bua, Paina, Kiracho, Mukaba & Fohl, 2015; WHO, 2014). Most of the mothers in this study used chlorhexidine or plain water on the cord. These findings are inconsistent with what was reported at Meru Teaching and Referral Hospital where most mothers used surgical spirit for cord care (Mumbi, 2016). Additionally, mothers in this study uncovered the cord observing that this facilitated healing and prevented contamination of the umbilical stump. Similar findings were reported in Nigeria (Afolaranmi et al., 2018; Osuchukwu, Ezerigbo & Eko, 2017) and Pakistan (Asim, Mahmood & Sohalil, 2015) where mothers kept the cord uncovered. Some mothers also applied breast milk, shea butter or soil on the cord which is also consistent with findings in Zambia (Herlihy et al., 2013), Tanzania (Mrisho et al., 2008) and Ghana (Moyer et al., 2009).

We found that most of the respondents used plain water to clean the soiled cord. Studies among mothers in Nepal (Shrestha, Battarai, and Silwal, 2013), Kenya (Kinanu et al., 2015) and South Sudan (Esmaeeli, 2013) reported a similar practice. Some mothers in our study also used surgical spirit to clean the cord which is consistent with the practice among Ugandan women (Waiswa et al., 2010). Additionally, it was encouraging to note that a substantial number of mothers in our study consistently washed hands during cord care and diaper change which is consistent with what was reported in Ghana (Nutor et al., 2016) and Iran (Adib-Hajbahery & Khosrojerdi, 2017).

## **5.2 Knowledge on Cord Care**

A significant proportion of mothers in our study knew that their hands and a soiled cord may be a source of umbilical infection which is consistent with the finding among Nepalese (Yadav et al., 2016), Columbian (Dayaratne & de Silva, 2016) and Iranian (Adib-Hajbahery & Khosrojerdi, 2017) mothers. Mothers were also knowledgeable about the signs of infection of the umbilical cord which mirrors what was reported among Indian (Castalino, Nayak, & D' souza, 2014; Purani et al., 2015), Colombian (Dayaratne & de Silva, 2016), South Sudanese (Mesekaa et al., 2017) and Nepalese (Yadav et al., 2016) mothers.

Furthermore, most of the respondents were knowledgeable on cord cleaning which is similar to what was reported in an earlier Kenyan study (Kinanu et al., 2015) where mothers knew the importance of keeping the cord clean. Our findings are, however, inconsistent with what was reported in South Sudan (Esmaeeli, 2013) where majority of the mothers had inadequate knowledge on cord cleaning.

### 5.3 Factors Associated with Cord Care Practices

Our findings showed that antenatal clinic visits were associated with cord care practices. Mothers who attended four or more ANC visits were more likely to practice better cord care. Similar findings were reported in Uganda (Owor et al, 2016), Zambia (Bwalya et al., 2017) and India (Baqui et al., 2007) where mothers who attended 3-4 antenatal clinic visits were more likely to practice the recommended cord care (chlorhexidine use WHO, 2014 recommendation). Although we did not explore why more antenatal care visits would result in better cord care practices, it is expected that health care providers would give mothers information during each visit on how to care for themselves and the baby including cord care. This could explain the better cord care practices among mothers who had more antenatal clinic visits.

We did not find an association between maternal factors and cord care practices, similar to the finding in Columbia (Dayaratne & de Silva, 2016) however, inconsistent with study findings in India (Baqui et al., 2007), Bangladesh (Shahjahan et al., 2012) and Uganda (Owor et al., 2016) which reported an association between maternal level of education and cord care practices whereby mothers with secondary education or higher had better cord care practices (uncovered, used chlorhexidine). Although we did not find out why mothers with higher level of education would practice better cord care, it is assumed that mothers with higher level of education are expected to have better understanding on importance of attending the recommended number of antenatal clinic visits, and are given information by health care providers on cord care on every visit. This could explain the better cord care reported among mothers in India, Bangladesh and Uganda.

Additionally, we found no association between maternal age, marital status, level of education, occupation and number of children and cord care practice which

was similar to the finding in Ethiopia (Msigna et al., 2016). A Zambian study, however, found an association between educational level and cord care whereby mothers with primary education initiated cord care within 48 hour after delivery (Bwalya et al., 2017). We found this interesting that mothers with primary level of education in Zambia practiced cord care within the first 48 hours after birth, though we did not explore more on this.

Furthermore, our findings showed no association between place of delivery and cord care. This is inconsistent with the finding in Nigeria (Afolaranmi et al., 2018) where mothers who delivered in a health facility were found to adequately care for the cord. Mothers who give birth in a health are expected to be given information on cord care by health care providers, it is also assumed that the health care provider initiates cord care in the presence of the mother and advises the mothers to continue the care at home which could be related to adequate cord care observed among the mothers.

#### **5.4 Factors Associated with Knowledge on Cord Care**

We found no association between maternal occupation and knowledge on cord care which is inconsistent with the findings in Ethiopia (Msigna et al., 2016) where formally employed mothers were knowledgeable on cord care. Although we did not establish why formally employed mothers were knowledgeable on cord care, it is expected that the mothers who are formally employed can afford to attend the recommended ANC visits and give birth in a health facility where they are expected to be given information on cord care by a health care provider. This could be attributed to knowledge on cord care reported in the Ethiopian study. Additionally, a study in the same country (Berhan & Gulama, 2018) found an association between employment, parity and antenatal clinic visits and knowledge on cord care. Although

we did not go further to explore why mothers who had no previous child would have inadequate knowledge on cord care, it is assumed that mothers who have not given birth before could have inadequate information on postnatal care including cord care. Additionally, mothers who attended ANC less than four times were found to have inadequate knowledge on cord care. WHO recommends four ANC visits and in every visit health care providers are expected to give the mothers' information on the recommended cord care which could be inadequate among mothers who attend ANC less than four times.

Furthermore, we found no association between number of children and ANC visits and knowledge of cord care which is inconsistent with the findings in Himalayas (Singh et al., 2019) where mothers with more than one child and those who attended four or more ANC visits were knowledgeable on cord care.

Additionally, we found no association between level of education and knowledge on cord care which is inconsistent with studies in Bangladesh (Ahmed et al., 2019); Ethiopia (Kebede, 2019) and Nigeria (Asiegbu et al., 2019) which found association between level of education and occupation and knowledge on cord care. Mothers with higher level of education and those employed were reported to be knowledgeable on cord care. We also found no association between age and knowledge of cord care which is inconsistent with the findings in Bangladesh (Ahmed, 2019). The young mothers were found to have inadequate knowledge on cord care which could be attributed to inadequate information on cord care by health care providers.

## **CHAPTER SIX**

### **CONCLUSION AND RECOMMENDATION**

#### **6.0 Conclusions**

Mothers at MTRH used chlorhexidine for cord care, although a significant number used substance considered harmful to the baby's cord (soil, saliva, ash).

Mothers in MRTH were knowledgeable on cord care cleaning and hand washing, uncovered the cord, applied chlorexidine and knew signs of infected cord, although some did not know the signs of an infected cord. Antenatal clinic visits were associated with better cord care. Mothers who attended four antenatal clinic visits were more likely to practice the WHO (2014) recommendations on cord care



## **6.1 Recommendations**

### **1. Clinical Practice**

The service providers handling mothers attending antenatal clinic visits at MTRH should encourage them to attend the four or more visits. Additionally, more awareness needs to be created, among mothers, on the importance of practicing the recommended cord care. Furthermore, mothers should also be provided with information on signs of an infected umbilical cord during antenatal clinic visits and after baby birth.

### **2. Policy**

Although the hospital has adopted the WHO (2014) policy on the cord care, there is need to create more strategies to facilitate implementation of these policies by the hospital management. The adopted policies need to be communicated to women seeking health services at MTRH to enhance uptake of information on appropriate cord care.

### **3. Research**

Future observational studies are warranted in order to comprehensively document the actual cord care practices of mothers in Kenyan hospitals to improve quality of cord care and overall health of the new born.

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## **APPENDICES**

### **APPENDIX I: INFORMED CONSENT**

#### **Study Title**

**EVALUATION OF NEWBORN CORD CARE PRACTICES AMONG POSTANATAL MOTHERS AT MOI TEACHING AND REFERRAL HOSPITAL, UASIN GISHU, KENYA.**

My name is Maculater Jebiwot Kipkoech, a master's student at Moi University School of Nursing.

#### **Principal Investigator**

MACULATER JEBIWOT KIPKOECH.

#### **Purpose**

The main purpose of this study will be to evaluate cord care practices among postnatal mothers attending CWC at six weeks at MTRH.

#### **Confidentiality**

Any information that you give will be held in strict confidentiality and will only be used for this purpose.

#### **Benefits**

Any mother found not practicing according to cord care standard practice and lacking knowledge will be educated promptly.

#### **Risks**

No risks involved in the study since no invasive procedures will be done on the baby.

#### **Participation**

Participation in this research is voluntary. If you decide not to take part in the study, your decision will not affect the quality of care your baby will receive now or in future. If you decide to participate you can decide to stop at any time without giving any reasons. A copy of this signed consent form will be given to you.



**Compensation**

No compensation will be offered for participation in the study.

**Expected Time of the study**

An exit interview will be carried out once your primary care giver finishes with you and the baby. No follow up interview will be required

**Contact Information**

If you have any question concerning the study or your participation in the study, contact the principal investigator. Maculater Jebiwot Kipkoech cell phone 0721815778. If you have any questions concerning your rights as a research participant, contact IREC Moi 05333471 Ext.3008.

**Consent:****By Signing this Form, I Agree that:**

The study has been explained to me. All my questions were answered.

I know I can stop being a part of the study anytime and it won't make any difference to how my baby will be taken care of in this hospital.

I can ask any questions at any time about the study.

\_\_\_\_\_

Name of Participant

\_\_\_\_\_

Signature & Date

\_\_\_\_\_

Name of person who obtained consent sign of person who obtained consent & Date

\_\_\_\_\_

## **RIDHAA - KISWAHILI**

### **Utafiti yenye mada**

Thathmini ya huduma ya Kamba Kwa mtoto mchanga, mazoezi, kati ya wamama wenye watoto umri wa wiki sita katika kiliniki ya hospitali ya rufaa ya Moi (MTRH).

### **Jina la Mtafiti**

Maculater Jebiwot Kipkoech mwanafunzi wa chuo kikuu cha Moi, katika kitivo cha utibabu nikisomea shahada ya uzamili.

### **Madhumunii**

Madhumunii ya utafiti huu ni kuthathmini huduma kwa Kamba ya mtoto mchanga; mazoezi, ya wamama wanaoleta watoto katika kiliniki ya watoto katika hospitali ya MTRH. Matokea ya uchanguzi huu yatasaidia kutoa elimu bora kwa wamama wote waliyo na watoto wachanga, jinsi ya kuwatunza vitovu vya wanao.

### **Siri**

Habari zozote utakaye peana itahifadhiwa kwa siri na itatumiwa tu kwa ajili ya utafiti huu.

### **Faida**

Mama yeyote atakayeonekana kuwa hana elimu ya jinsi ya kutunza Kamba ya mtoto atapewa elimu bora.

### **Hatari**

Uchanguzi huu ni salama na hakuna hatari yeyote inayoyeweza kumpata mama ama mtoto wake kwani hakuna sehemu ya mwili itakatwa ama kudungwa.

### **Ushiriki**

Ni kwa hiari. Unaruhusiwa kujiondoa wakati wowote na kujiondoa kwako haiwezi kuadhiri jinsi mwanao atahudumiwa katika hospitali hii. Utapewa nakala ya ridhaa hii ambaye umeisaini.

**Faida**

Hakuna fedha zitakazolipwa mtu yeyote atakaye shiriki katika utafiti huu

**Mawaziliana**

Kama una maswali yeyote, tafadhali uliza ama piga simu kwa Maculater J. Kipkoech 0721815778. Ukiwa na maswali yeyote kuhusu haki zako waziliana na IREC Chuo Cha Moi 053 33471 Ext. 3008.

**Ridhaa**

Kwa kusaini fomu hii, mimi nathibitisha kwamba,

1. Nimeelewa utafiti huu vizuri. Maswali yangu yote yamejibiwa vilivyo
2. Najua kwamba naweza kujiondoa katika utafiti huu wakati wowote na kujiondoa kwangu hawezi kuadhiri jinsi mwanangu atakavyohudumiwa katika hospitali hii
3. Ninayonafasi ya kuuliza maswali wakati wowote wa utafiti huu.

---

Jina la mshiriki utafiti

Sahihi & Tarehe

---

Jina la aliyepeana ridhaa

Sahihi & Tarehe

**APPENDIX II: QUESTIONNAIRE INSTRUMENT**

For most answers, check the box (es) for the most applicable and fill in the blanks by use of the symbol (X)

**SECTION A. Socio-demographic characteristics****1. Maternal age (in years).....****2. Marital status**

- a)  Married
- b)  Single
- c)  Separated
- d)  Divorced

**3. Level of education**

- a)  Tertiary
- b)  Secondary
- c)  Primary
- d)  No formal education

**4. Occupation**

- a)  Employed
- b)  Unemployed
- c)  Housewife
- d)  Unskilled worker

**5. Ethnicity?**

- a)  Kalenjin
- b)  Kikuyu
- c)  Luhiya
- d)  Luo
- e)  Kisii
- f)  Others specify.....

**6. How many other children do you have.....?**

**7. Did you attend Antenatal clinic during this pregnancy?**

a)  Yes

b)  No

**8. If yes, what was the attendance of the visits (number of times) .....**

**9. How far was your pregnancy when you first attended the antenatal clinic (in weeks).....**

**10. Where was the place of birth?**

a)  Health facility

b)  Home

c)  On the way to hospital

**11. If in a health facility, which health facility?**

a)  MTRH

b)  County referral hospital

c)  Sub-county hospital

d)  Health center

e)  Dispensary

f)  Private

**12. Who was your birth assistant**

a)  Nurse

b)  Doctor

c)  Traditional birth attendant

d)  Mother-in-law

e)  Neighbor

f)  Self

g)  Others Specify.....

**SECTION B: Cord Care Practices****1. How did you care for your baby's cord?**

- a)  Cover
- b)  Uncover
- c)  Applied substance onto it.
- d)  No substance applied

**2. What was the substance that you used for cord care?**

- a)  Chorhexidine
- b)  Surgical spirit
- c)  Turmeric
- d)  Oil/ Vaseline, coconut, oil machine,
- e)  Shea butter
- f)  Breast milk
- g)  Ash/powder from local tree
- h)  Local herbs
- i)  Cow dug
- j)  Savlon
- k)  Powder ground from pumpkin stem
- l)  Talcum powder
- m)  Ghee (purified butter)
- n)  Boric powder
- o)  Others specify.....

**3. How many times in a day did you apply the substance.....?****4. For how long did you care for the cord (in days).....?**

**5. How do you apply the diaper in relation to cord care?**

- a)  Below the umbilicus
- b)  Above the umbilicus

**6. Who initiated cord care**

- a)  Nurse
- b)  Doctor
- c)  Clerk
- d)  Patient attendant
- e)  Cleaner
- f)  Care taker
- g)  Self
- h)  Others specify.....

**7. Were you shown how to care for the cord**

- a)  Yes
- b)  No

**8. Where you served with the substance for cord care use?**

- a)  Yes
- b)  No

**9. How do you care for the cord while bathing the baby at home?**

- a)  Wiped the baby
- b)  Immersed the baby in water

**SECTION C: Knowledge on Cord Care****1. Were you given information on cord care during antenatal clinic visits?**a)  Yesb)  No**2. If yes, who gave you the information?**a)  Nurseb)  Doctorc)  Clerkd)  Patient attendante)  Cleaner**4. Have you been given information on cord care since the birth of this baby?**a)  Yesb)  No**5. If yes, who gave you the information?**a)  Nurseb)  doctorc)  Friendd)  Neighbore)  Health pamphletsf)  Observationg)  Media



**6. If the baby's cord is soiled with urine or feces, how would you clean it?**

- a)  Clean with herbal mixture
- b)  Clean with plain water
- c)  Clean with salty water
- d)  Clean with surgical spirit

**7. Mothers hands may be contaminated during cord cleaning and diaper change and may become the source of umbilical infection**

- a)  Strongly agree
- b)  Agree
- c)  disagree
- d)  strongly disagree

**8. A dirty umbilical cord may cause infection**

- a)  Strongly agree
- b)  Agree
- c)  disagree
- d)  strongly disagree

**9. Signs of umbilical infection include redness and swelling of area of umbilical cord and surrounding**

- a)  Strongly agree
- b)  Agree
- c)  disagree
- d)  strongly disagree

**10. When the umbilical cord is infected the stump may discharge pus**

- a)  Strongly agree
- b)  Agree
- c)  disagree
- d)  strongly disagree

**11. The baby may present with hotness of the body when the umbilical cord is i**

- a)  Strongly agree
- b)  Agree
- c)  disagree
- d)  strongly disagree

**APPENDIX III: BUDGET**

SNo	Item	Quality	Unit Cost Kshs)=	Total cost (Kshs)
1	Foolscaps	3 reams	500	1,500
2	Pocket files	20	100	2,000
3	Spring files	20	50	1,000
4	Flash disk 4 GB	3	1,500	4,500
5	Printing papers	3 reams	600	1,800
6	Printing photocopy and binding		20,000	20,000
7	Ball pens	50	20.00	1,000
8	Statistician	1	30,000	30,000
9	Research assistants	4	10,000	10,000
10	Pencils	3 packets	150.00	450.00
	Contingency 10%			8,000
	Grand total Kshs			90,400

## APPENDIX IV: TIME FRAME (2018/2019)

<b>ACTIVITY</b>  <b>DATE</b>	<b>Jan-Aug 2018</b>	<b>Sept 2018</b>	<b>Oct 2018</b>	<b>Nov 2018</b>	<b>Dec 2018</b>
<b>Proposal writing</b>					
<b>IREC review</b>					
<b>Correction and piloting of research instruments</b>					
<b>Data collection</b>					
<b>Data analysis and project writing</b>					
<b>Project presentation to supervisors, Correction of project</b>					
<b>Final project writing and presentation for examination</b>					

## APPENDIX V: IREC APPROVAL



MOI TEACHING AND REFERRAL HOSPITAL  
P.O. BOX 3  
ELDORET  
Tel: 33471/2/3

Reference: IREC/2018/182

**Approval Number: 0003132**

Ms. Maculater Jebiwot Kipkoech,  
Moi University,  
School of Nursing,  
P.O. Box 4606 -30100,  
**ELDORET-KENYA.**

Dear Ms. Kipkoech,

### RE: FORMAL APPROVAL

The MU/MTRH- Institutional Research and Ethics Committee has reviewed your research proposal titled: -

***"Evaluation of Newborn Cord Care Practices among Postnatal Mothers at Moi Teaching and Referral Hospital Uasin Gishu, Kenya".***

Your proposal has been granted a Formal Approval Number: **FAN: IREC 3132** on 1<sup>st</sup> November, 2018. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; hence will expire on 31<sup>st</sup> October, 2019. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date. You will be required to submit progress report(s) on application for continuation, at the end of the study and any other times as may be recommended by the Committee.

Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. You will also be required to seek further clearance from any other regulatory body/authority that may be appropriate and applicable to the conduct of this study.

Sincerely,

**PROF. E. WERE**  
**CHAIRMAN**

**INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE**

cc	CEO	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD



MOI UNIVERSITY  
COLLEGE OF HEALTH SCIENCES  
P.O. BOX 4606  
ELDORET

1<sup>st</sup> November, 2018



**APPENDIX VI: MTRH APPROVAL**

An ISO 9001:2015 Certified Hospital

**MOI TEACHING AND REFERRAL HOSPITAL**

Telephone : (+254)053-2033471/2/3/4  
 Mobile: 722-201277/0722-209795/0734-600461/0734-683361  
 Fax: 053-2061749  
 Email: [ceo@mtrh.go.ke](mailto:ceo@mtrh.go.ke)/[directorsofficemtrh@gmail.com](mailto:directorsofficemtrh@gmail.com)

Nandi Road  
 P.O. Box 3 – 30100  
 ELDORET, KENYA

Ref: ELD/MTRH/R&amp;P/10/2/V.2/2010

12<sup>th</sup> November, 2018

Ms. Maculater Jebiwot Kipkoech,  
 Moi University,  
 School of Nursing,  
 P.O. Box 4606-30100,  
ELDORET-KENYA.

**APPROVAL TO CONDUCT RESEARCH AT MTRH**

Upon obtaining approval from the Institutional Research and Ethics Committee (IREC) to conduct your research proposal titled:-

***"Evaluation of Newborn Cord Care Practices among Postnatal Mothers at Moi Teaching and Referral Hospital Uasin Gishu, Kenya".***

You are hereby permitted to commence your investigation at Moi Teaching and Referral Hospital.

**DR. WILSON K. ARUASA, MBS**  
**CHIEF EXECUTIVE OFFICER**  
**MOI TEACHING AND REFERRAL HOSPITAL**

cc - Senior Director, (CS)  
 - Director of Nursing Services (DNS)  
 - HOD, HRISM

---

*All correspondence should be addressed to the Chief Executive Officer*

*Visit our Website: [www.mtrh.go.ke](http://www.mtrh.go.ke)*

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