KNOWLEDGE AND PRACTICES ON ESSENTIAL NEWBORN CARE AMONG POSTNATAL MOTHERS AT JUBA TEACHING HOSPITAL SOUTH SUDAN

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT FOR THE DEGREE OF MASTERS IN MEDICINE, PAEDIATRIC AND CHILD HEALTH UNIVERSITY OF NAIROBI

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DECLARATION

This dissertation is my original work and has not been submitted for a degree in any other university or published elsewhere.

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LIST OF ABBREVIATIONS

ANC	**:**	Antenatal Care Clinic
BCG	**:**	Bacille Calmette Guerin
DTP	**:**	Diptheria Pertussis Tetanus
EPI	**:**	Expanded Programme on Immunization
IMNCI	**:**	Integrated Management of Newborn and Child Illnesses
JTH	**:**	Juba Teaching Hospital
SDG	**:**	Sustainable Development Goals
OPV	**:**	Oral Polio Vaccine
RSS	**:**	Republic of South Sudan
SSHHS	**:**	South Sudan Household Health Survey
STI	**:**	Sexually Transmitted Infections.
SVD	**:**	Spontaneous Vertex Delivery
WHO	**:**	World Health Organization

DEFINITIONS OF TERMS

Essential Newborn Care : A comprehensive recommendation designed by WHO to improve the health of the newborn through interventions before conception, during pregnancy and soon after birth, it includes clean delivery and cord care, thermoregulation, initiation of breastfeeding, eye care, immunization, management of newborn illnesses, care of the preterm/low birth weight infants and initiation of breathing and resuscitation.

Neonate: Any infant under 28 days of life.

Postnatal Period: A period from birth to six weeks after delivery.

Knowledge: Refers to familiarity, awareness or understanding gained through experience or study.

Practice: Refers to the actual application of an idea or believe as opposed to theories about the application.

ABSTRACT

INTRODUCTION: Globally neonatal mortality remains high despite a declining proportion of deaths among children under five years of age. Almost all neonatal deaths occur in low and middle income countries with the highest in sub-Saharan Africa. South Sudan Household Health Survey (SSHHS) 2010 estimated neonatal mortality at 52/1000 live births. The study aimed to assess maternal knowledge and practices towards essential newborn care at Juba Teaching Hospital**.**

OBJECTIVES: To assess the knowledge and practices towards selected aspects of essential newborn care among postnatal mothers at Juba Teaching Hospital and to determined the socio-demographic factors that influenced maternal knowledge on newborn care.

METHODOLOGY: A hospital based cross-sectional study was conducted at Juba Teaching Hospital where 384 postnatal mothers were interviewed using pretested questionnaires. Knowledge was assessed using closed and open ended questions. Practice was assessed using a three point likert scale. Data was analysed using STATA version 12.0.

RESULTS: The mean age of the mothers was 26.2(SD± 6.3) years. Only 45 (11%) mothers attained tertiary education. The antenatal history revealed 215 (66%) mothers had at least four ANC. Only 70 (18.2%) mothers knew that umbilicus cord should be left uncovered. More than 346 (90.1%) mothers knew of breastfeeding on demand, 309 (80.5%) mothers knew of exclusive breastfeeding and use of colostrum was known by 322(83.9%) mothers. Modes of thermoregulation identified by the mothers included kangaroo care 128(33%) and warm clothing 347(90%). Only 80 (20.8%) mothers identified BCG and OPV as birth vaccines and 13 (3.4%) believed vaccines were harmful. Hypothermia as a sign of serious illness was identified by 159 (41.4%) mothers. Positive practice was noted towards breastfeeding, eye care and immunization. Multivariate analysis showed association between inadequate maternal knowledge and provision of information during ANC and after delivery (AOR 2.55 p <0.009 CI 1.26-5.17) and (AOR 3.13 <0.001 CI 1.83-5.33) respectively.

CONCLUSION: Adequate knowledge was found towards breastfeeding with knowledge gaps existing in cord care, immunization, eye care and thermoregulation. Positive practice was found towards breastfeeding, , eye care and immunization.

1.0 BACKGROUND AND LITERATURE REVIEW

1.1. INTRODUCTION

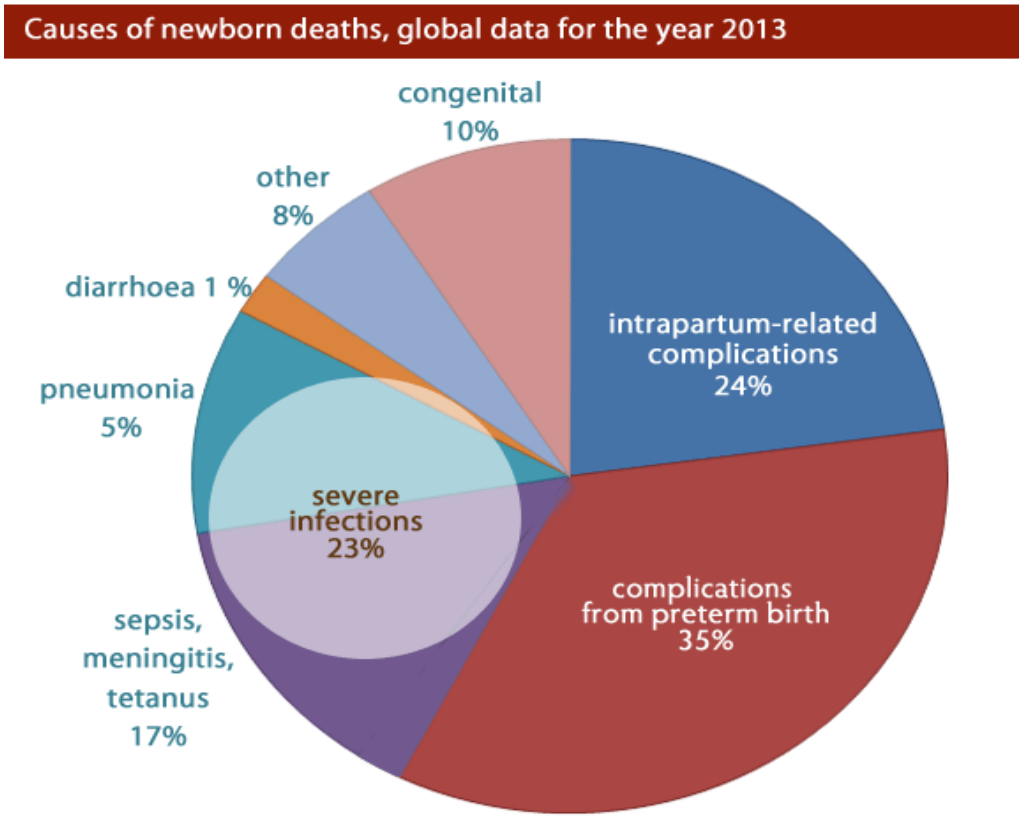
Essential newborn care is a set of comprehensive recommendations designed by World Health Organization (WHO) to improve health of the newborn through intervention before conception, during pregnancy, soon after birth and in postnatal period [1]. It includes thermoregulation, clean delivery and cord care, initiation of breastfeeding, immunization, eye care, recognition of danger signs, care of the preterm / low birth weight infant and management of newborn illnesses. Lack of effective use of the recommendations by the health care providers may lead to increased neonatal mortality.

Neonatal mortality remains high despite a declining proportion of deaths among children under five years of age. World Health Organization 2013 estimated neonatal mortality around 45% of all death in under-five mortality [2]. The proportion of child deaths which occur in neonatal period has increased in all WHO regions over the last years, from which the leading cause of death is prematurity. Up to two third of newborn death could be prevented if skilled health workers perform effective measures at birth and during the first week of life. The majority of deaths occur in the first 24 hours of life [3].

Neonatal mortality still remains a major public health problem and the leading cause of mortality in children below five years of age in South Sudan. South Sudan household health survey conducted in 2010 estimated neonatal mortality at 52 per 1000 live births [4] and in 2013 WHO estimated neonatal mortality rate at 39 per 1000 live births in South Sudan [5].

The third sustainable development goal (SDG3) of the United Nation globally aim to end the preventable deaths of newborns and children under five years of age, with the targets of under-five mortality (25 deaths per 1000 live births from 33 deaths per 1000 live births) and neonatal mortality (12 deaths per 1000 live births from 22 deaths per 1000 live births) but still most of the low income resource countries are far from the target [3]. Causes of neonatal deaths are prematurity/complications 35%, neonatal infection 23%, intrapartum complication 24%, congenital anomalies, and diarrhoea among other causes of neonatal deaths [6] (Figure 1)

Figure 1: Causes of newborn deaths, global data for the year 2013



Source: Liu L et al. 2014. Global, regional, and national causes of child mortality in 2000–2013: an updated systematic analysis. The Lancet.

1.2. LITERATURE REVIEW

WHO has come up with the essential new-born care practices which is simple, has cost effective measures that can be used by both health care workers and the primary caregiver to ensure improved neonatal outcome. Components of the WHO essential newborn care practices include cord care, breastfeeding, thermoregulation, eye care, immunization, recognition of the danger signs and care of the low birth weight infants.

1.2.1. Cleanliness and umbilical cord care.

The umbilical cord attaches the foetus to the placenta. After birth the umbilical cord is clamped and cut, it dries and falls off in five to fifteen days. It is an important source of infection in the first few days of life due to unhygienic cord care practices including cord cutting and tying [7], therefore it is agreed that cord cutting using sterile instrument is the best practice needed for cord care [8]. Studies from a range of countries showed various substances including cow dung, ash, oil and butter commonly applied on the umbilical cord in order to promote healing [9]. Dore et al recommended the practice of keeping the cord clean and dry without applying anything [10]. After the umbilical cord separates minimal discharge is expected, therefore the area should be kept clean and dry to promote healing [8]. Mothers should be aware of the signs of umbilical cord infection such as pus discharge, reddening around the umbilical stump and/or the surrounding skin. A study conducted in Benin City Nigeria showed 71.2% of mothers were aware of cord care, 51.3% were influenced by the nurses, 32% by the mother and 5.8 % by the mothers in law [11].

Another study conducted on 307 mothers in an urban slum in Nairobi, Kenya by Obimbo et al found that most mothers (91%) knew the need for hygiene during cord cutting, only 28% knew about hygiene while tying the cord, 79% of mothers where afraid of handling the unhealed cord and less than 50% had good knowledge on postnatal cord care [12].

The World Health Organization recommended daily chlorhexidine 7.1% application to the cord stump during the first week of life for the newborns who are born at home in setting with high neonatal mortality and clean dry cord care in setting with low neonatal mortality or health facility delivery [7]. Mullany et al study in Nepal also revealed reduction in neonatal omphalitis and neonatal mortality following the use of chlorhexidine [13].

1.2.2. Thermoregulation

Thermoregulation in neonates is one of the biological adjustments taking place at birth to maintain normal body temperature of 36.5-37.5°C. A newborn regulates temperature much less efficiently than adult and loses heat more easily, low birth weight and premature infant are at greater risk [14]. The World Health Organization defined hyperthermia as axiliary temperature above 37.5°C and hypothermia below 36.5°C [14]. Hypothermia is a life threatening condition leading to neonatal mortality, therefore prevention and management of hypothermia are the key interventions for reducing neonatal morbidity and mortality. Heat loss occurs through conduction, convection, radiation and evaporation [14]. A study done in Nigeria showed neonatal hypothermia remains a major problem in neonatal practices in sub-Saharan Africa and recommended use of low-technical measures such as kangaroo care, hot water bottles, warm room may be life saving [15].

A study done in Sri Lanka on knowledge and practices in thermoregulation of newborn revealed 63% of babies had hypothermia and 65% mothers had knowledge and its preventive method while 35% had very poor practical application [16].

WHO recommends the "warm chain" which is described in 10 steps to ensure the newborn is not at risk of hypothermia. They include warm delivery, immediate drying, skin to skin contact,

breastfeeding, bathing and weighing postponed, appropriate clothing, rooming in, warm transportation and resuscitation, training and awareness raising [14].

Therefore warm chain must be maintained by the mothers at home, whether delivery took place at home or in the hospital. After delivery, practices to prevent hypothermia include rooming in, breastfeeding on demand, and dressing the infant appropriately while early bathing expose newborn to hypothermia [8, 14] . WHO recommends bathing after six hours of life and preferably on the second or third day of life [8]. Extra measures like use of radiant heater and incubator care are needed for low birth weight and premature infant because they are at higher risk of hypothermia [14].

1.2.3. Immunization

Immunization is the process whereby a person is made immune or resistant to an infectious disease by administration of vaccine. It is the most effective public health intervention that reduces morbidity and mortality from vaccine preventable diseases, therefore it plays a greater role to the attainment of Millennium Development Goal 4 (MDG4).The Expanded Programme of Immunization was established by World Health Organization 1974 to ensure universal access to the routine recommended childhood vaccine include BCG, Polio, DTP, measles vaccine preventable against tuberculosis, poliomyelitis, diphtheria, tetanus, pertussis and measles [17] , The Ministry of Health South Sudan, Department of Child Health and Expanded Programme on Immunization offers routine immunization to infant which includes BCG alive attenuated vaccine given at birth or within the first two weeks and the vaccine efficacy is estimated to be about 51% in preventing any tuberculosis disease and up to 78% in protecting children from meningeal tuberculosis and oral polio or Sabin live attenuated given at birth [18].

A study done in Kenya by Amolo revealed 17.8% of postnatal mothers identified BCG and OPV at birth and 7% of postnatal mothers still believed vaccines are harmful [19].

Uptake of vaccination services is dependent on several factors including knowledge and attitude of the mothers. Correct knowledge and positive attitude of the mothers on immunization contributes to the achievement of immunization high rates [20].

1.2.4. Breastfeeding

Breastfeeding is the normal way of providing infants with nutrient needed for healthy growth and development [21], breast milk is the best milk for the newborn. The proportion of breastfed babies is high worldwide, there are wide variations in duration of breastfeeding with sub-optimal breast feeding practices still the norm in most countries [8]. WHO recommends initiation of breastfeeding within the first hour after birth and exclusively for six months of age, with continued breastfeeding along with appropriate complementary feeds up to two years of age or beyond [21] . Delayed initiation of breastfeeding was found to be associated with increased neonatal mortality [22]. Lack of exclusive breast feeding substantially increases the risk of poor newborn and childhood outcome. Globally less than 40% infants under six months of age were exclusively breast fed [20], whereas in SSHHS 2010 revealed 45% of infants under six months were exclusively breastfed compared to 21.1% in 2006 [4].

Breastfeeding is of benefit to both mother and the newborn, to mother immediate breast feeding stimulates uterine contraction and delivery of placenta therefore preventing postpartum haemorrhage and for the newborn early breastfeeding provide nutrition, warmth and colostrums which contains immunological factors that prevent infections [23].

A study done in Pakistan showed less than half of the mothers(48%) initiated breastfeeding within two hours of delivery, colostrums was discarded by 43% and prelacteal feeds were given by 73%. Rehana et al recommend appropriate health education to improve mother's knowledge regarding newborn care practices [24].

1.2.5. Recognition of danger signs

Early detection of the neonatal illness is an important step towards the improving newborn survival. Every year an estimated three million children die during their first month of life and about one third of these deaths occur during the first 24 hours [3]. Majority of these deaths occur at home indicating that few families recognize danger signs of newborn illness, and or majority of the neonate are not taken to the health care facilities when they are sick. A study done by Dongre, et al in India showed poor awareness of mothers regarding newborn danger sign and recommend the need for raising awareness building for early recognition and prompt treatment[25]. Different tools to facilitate identification of these health problems and to reduce neonatal mortality have been introduced into health programme in several countries. Integrated Management of Newborn and Childhood Illness (IMNCI) developed by WHO focuses on assessment of general danger signs of severe illness which includes difficulty feeding, hypothermia, fever, convulsions, difficulty in breathing, jaundice on day one of life [8]. A community survey study done in south-western Uganda showed poor knowledge on key newborn danger signs where 58.2% of mothers could only identify 1 and 14.8% could identify 2 danger signs [26].Poor knowledge also associated with delay in care seeking. Waiswa et al in Uganda noted delay in primary caregivers bringing newborns to hospital contributed significantly to the newborn mortality [27].

1.2.6. Eye care

Ophthalmia neonatorum is an acute mucopurulent conjunctivitis that occurs in the first month of life [28], and it appears in the first 2-5days after birth. Ophthalmia neonatorum is usually contracted during birth from the infected canal of the mother and the commonly caused organisms are chlamydia trachomatis and neisseria gonorrhoea [8], therefore screening of the pregnant mothers is important for sexual transmitted diseases (STIs) to reduce the risk of ophthalmia neonatorum. Newborn presents with eye discharge, lids swelling and /or reddening of the eyes [8].Traditional practices are still going on by the primary caregiver such as the application of breast milk and other substance to treat eye infections. Rehana et al study showed 68% of the mothers still used substances on the newborn eyes to prevent eye infections [24].These have been shown to be ineffective in treating neonatal conjunctivitis and should not be used [8]. Mothers should be advised to bring their babies to hospital if they notice any eye discharge, swelling or reddening and avoid use of traditional substance to prevent corneal ulceration and blindness [8].

1.3. STUDY JUSTIFICATION AND UTILITY

Although there has been a dramatic improvement in child survival, the burden of mortality in the neonatal period has remained virtually unchanged. Neonatal mortality is still a major cause of death in children under five in South Sudan which can be prevented by performing the simple and effective WHO recommendation on essential newborn care practices. Several studies conducted worldwide have shown poor maternal knowledge and negative attitude and practices on essential newborn care.

This study therefore, aimed to identify the gaps in the knowledge and practices of newborn care among postnatal mothers at Juba Teaching Hospital at the point of discharge from the hospital.

The ability to identify gaps in knowledge and practices on essential newborn care will be communicated to the health care provider for appropriate interventions that will improve newborn outcome.

1.4. STUDY QUESTION

What was the level of knowledge and practices on essential newborn care among postnatal mothers at Juba Teaching Hospital?

1.5. OBJECTIVES

1.5.1. Primary Objectives

To assess knowledge and practices on essential newborn care towards cord care, initiation of breastfeeding, thermoregulation, eye care, immunization and the signs of serious illness in newborn among postnatal mothers at Juba Teaching Hospital.

1.5.2. Secondary Objectives

To determine socio-demographic factors associated with maternal knowledge on essential newborn care.

2.0. METHODOLOGY

2.1. STUDY DESIGN

Hospital based descriptive cross sectional study.

2.2. STUDY AREA

The study was carried out at Juba Teaching Hospital (JTH) postnatal wards. Juba Teaching Hospital is located in Juba city Central Equatoria State and provides health services to the population living in Central Equatoria State while also serving as a referral hospital for the entire country of South Sudan. Juba Teaching Hospital provides services to nearly 1.6 million children below five years. The facility has 22 wards with various departments and has a total bed capacity of 580. Two out of the 22 wards in the hospital are postnatal wards with a capacity of 40 beds. Each postnatal ward has 9 registered nurses three in every shift, health education was rarely provided to the mothers after delivery.

2.3. STUDY POPULATION

The study population consisted of postnatal mothers with term neonates admitted in the postnatal wards at Juba Teaching Hospital.

2.4. STUDY PERIOD

The study was conducted over period of two months (November to December 2015)

2.5. INCLUSION CRITERIA

- Postnatal mothers of term neonates in postnatal wards JTH.
- Postnatal mothers who signed informed consent.

2.6. EXCLUSION CRITERIA

- Postnatal mothers, whose neonate died or were admitted in newborn unit or paediatric wards after delivery immediately.
- Critically sick mothers and mothers with mental illnesses.

- Postnatal mothers of babies with remarkable congenital anomalies likely to interfered with delivery of essential newborn care practices.

2.7. SAMPLE SIZE AND PROCEDURE

2.7.1. Sample Size Determination

Sample size was determined by Fisher's formula for sampling proportions for an infinite population.

$$n = \frac{Z_{1-\alpha}{}^2 p\ 1-p}{d^2} n = \frac{1.96\ ^2 \times 0.50 \times 0.50}{0.05^2} = 384$$

n = sample size with finite population correction

$Z_{1-\alpha}$ = statistic for 95% level of confidence = 1.96

p = population proportion with assumption of 50% of the mothers have moderate knowledge on essential new-born care practices.

d = margin of error = ±5% (0.05)

The sample size of 384 was obtained.

2.7.2. Sampling Method

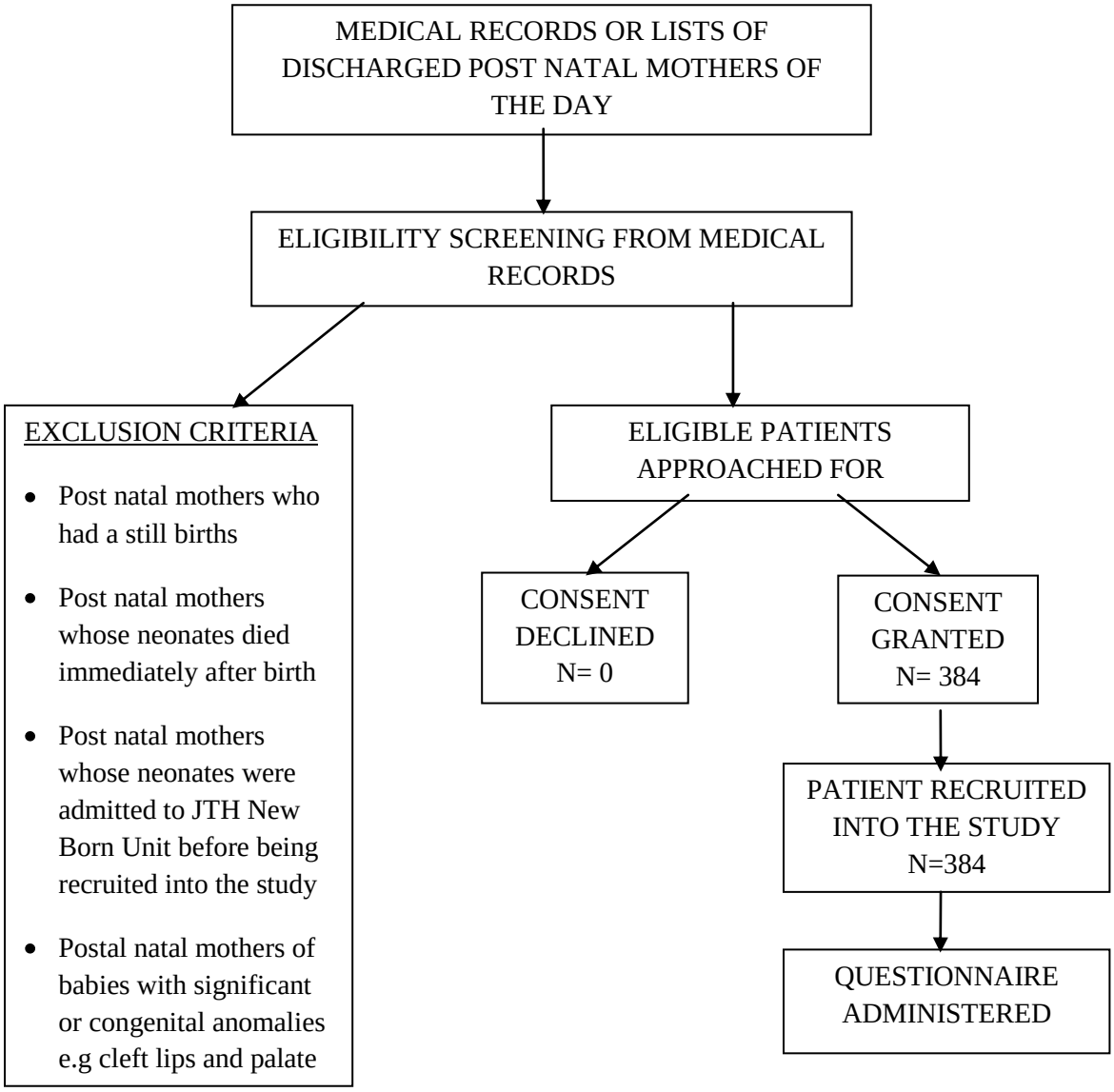
A consecutive sampling method was used to select postnatal mothers. Medical record was used as an entry point to determine the list of mothers discharged from the postnatal and the participant were enrolled throughout the period of study day, night and over the weekends. Though there is no specific policy for the length of postnatal stay in the hospital in South Sudan,

normal SVD without complication are discharged after four hours and Caesarean Section deliveries after three days. Mothers who delivered via Caesarean Section were interviewed on day two or three after delivery. This process of sampling was repeated until the sample size was obtained.

2.7.3. Recruitment and Process of Obtaining Consent

Postnatal mothers who met eligibility criteria from an initial inspection of the medical record were then approached by the researcher or the two research assistants (clinical officers). The interviewers introduced themselves and explained to the potential study participant the purpose and method of the study. Both written and verbal consent were obtained from the mothers (Appendix 2).

Figure 2: Flow Chart for Recruitment



2.7.4. Data Collection

Data was collected by the researcher and two research assistants (clinical officers) who were selected randomly from the department of Obstetrics and Gynecology, trained by the researcher on how to use the study tools and standard operating procedures form until they demonstrated competency in completeness and accuracy of the data entry. After recruiting the study subjects, structured pretested questionnaire was administered to the mothers by the researcher or the two research assistant who read the questions and filled in the mother's responses. The questionnaire consisted of both closed and open ended questions addressing the following variable.

(Appendix 1)

i. Neonate and parent socio-demographic data.
ii. Antenatal and birth history of the neonate.
iii. Mother's knowledge on WHO essential newborn care recommendations.
iv. Three point Likert scale was used to assess maternal practices on various aspect of essential newborn care practices. The rating include agree, neutral and disagree.

2.7.5. Data Analysis

All data were entered into a computer database, cleaned and corrected for outlying or invalid values. The data management was conducted using Microsoft Access database and then analysed using STATA version 12.0 software. Scoring systems was used to analyse responses to closed ended questions on knowledge. Each correct response consistent with WHO guidelines on essential newborn care was assigned a score of 1 and score of 0 for response inconsistent with WHO guidelines.

- Good practice for cord care is defined as dry uncovered cord care with no bandages, or substance applied on the cord unless when necessary.

- Good practice for breastfeeding is defined as breastfeeding initiation within one hour and continued exclusive breastfeeding for six months.

- Good practice for eye care is instillation of eye drop or ointment at birth unless there is any eye disease.

- Good practice for vaccines is administration of BCG/OPV within one week after delivery.

- Good practice for thermoregulation includes rooming in, delaying bath to six hours after birth preferable on day 2 or 3 of life, appropriate clothing and skin to skin contact.

Any response that was inconsistent with WHO recommendations of essential newborn care was assigned a score of zero (0).The open ended questions were coded independently by the two researchers to reveal the main theme. The themes were subjected to content analysis and frequency reported. Due to lack of standard and validated scoring for maternal knowledge on essential newborn care, median score of the questions was used as a cut off to distinguish between inadequate knowledge and adequate knowledge .Those who scored below the median were considered to have inadequate knowledge and those who scored above were considered to have adequate knowledge. Similar studies had previously used the median score on knowledge items as a cut off level to distinguish between good and poor knowledge on essential newborn care practices [19].

The level of knowledge was then cross tabulated against the maternal variables of interest. The variables that were significantly associated with poor knowledge at bivariate analysis were then analysed further using multivariable logistic regression analysis to determine the independent

factors associated with inadequate knowledge. Associations between the inadequate knowledge and each independent variable were then examined using an odd ratios (OR) and 95% confidence.

Reponses for practices were based in three Likert point scale agree, neutral and disagree. Statistical testing was done using Chi square tests to compare dependent and explanatory variables. Data was then presented using pie chat, histogram and tables.

2.7.6.Study Assumptions

1. Misinterpretation of the questions were minimal.

2. Minimal errors were obtained during analysis.

2.7.7. Strengths of Study

The finding of this study provides valuable information for improving the quality of the programs to educate mothers on essential newborn care practices. This is possible by identification of the knowledge gap and negative practices towards newborn care.

This study being across sectional provided a relative quick way to obtain information on newborn care.

2.7.8. Study Limitations

1. This study was carried out at Juba Teaching Hospital therefore it might not represent other postnatal mothers who delivered outside Juba Teaching Hospital.
2. The time for data collection was very limited due to insecurity around Juba city which led to poor attendance of the mothers.
3. Lack of universal standard scoring system to define adequate or inadequate knowledge and practice.
4. Health workers were not involved in the study.

2.7.9. Ethical Considerations

The study was carried out after approval from Kenyatta National Hospital /University of Nairobi Ethics and Research Committee and the Directorate of Research and Planning /Ministry of Health / Republic of South Sudan.

Both verbal and written consent were obtained from the mothers after full explanation of the research purpose by the researcher or the two research assistants. The consent forms were interpreted in Arabic language for those participants who were not proficient in English language.

2.7.9.1. Confidentiality

The questionnaire was filled within Juba Teaching Hospital postnatal wards. All data obtained were kept in a password computer files to restrict access. The data collection tool did not bear the participant names, participants were identified by the study number.

2.7.9.2. Benefits of the study

The finding of this study will be communicated to the health care institutions to help in improving neonatal health care and outcome in form of giving appropriate information on newborn care during ANC. The principal investigator also communicated any individualized information to the primary care provider in cases where it was deemed that participants would benefit from such information.

2.7.9.3. Control of errors and biases

The questionnaire was pretested on a sample population at Juba Teaching Hospital to ensure validity of the study questionnaire before commencement of the study. Study tools were then revised accordingly. Research assistants were trained by the researcher and provided with standard operating manual to guide in filling the questionnaire which ensures uniformity.

Data collected were assessed on daily basis to ensure completeness. Questionnaires incorrectly or incompletely filled were rejected if the mother had left the facility or re-interviewed to correct the errors. Data were entered into a pre-programmed computer on weekly basis and cross checked against the questionnaire was done to ensure validity of the entries.

3.0. RESULTS

During the study a total of 384 postnatal mothers attending Juba Teaching Hospital were interviewed to determine their knowledge and practices on essential newborn care.

3.1. MATERNAL SOCIO-DEMOGRAPHIC CHARACTERISTICS

Table 1 presents the socio-demographic characteristics of the postnatal mothers. The mean age of the postnatal mothers was 26.2 years (SD± 6.3) while that of the fathers was 32.7 years (SD ±6.9). Out of 384 interviewed mothers 66.4% were married while 33.6% were unmarried (18.7% single, 12.8% separated and 2.1% divorced)**.** Employed mothers accounted for 40.9 % while unemployed were 59.1%. Mothers with professional careers accounted 27.3 % of those employed while 21.6% were in domestic services, (19.7%) in small scale businesses. Skilled manual accounted for 15.2%, unskilled manual 6% and agriculture accounted for 10.2%.The proportion of the mothers who received some secondary school was 23.9%, 11.7% completed secondary school, 17.7 % some primary education,14.1% completed primary education and 16.2% had no formal education. The majority of participants 86.7% were Christians.

Table 1: Socio-demographic characteristics of the respondents

Variables	Frequency (n)	Percent (%)or SD
Maternal age		
16-18 years	25	6.5
19-25 years	134	35
25-34 years	173	45.2
35-45 years	51	13.3
Marital status		
Married	255	66.4%
Unmarried	129	33.6%
Father's age		
Mean age of the fathers(SD) Min-Max (20-60)	32.7	±6.9
Mother's occupation status		
Employed	157	40.9
Unemployed	227	59.1
Mother's education level		
No formal education	62	16.2
Some primary education	68	17.7
Complete primary education	54	14.1
Some secondary education	92	23.9
Complete secondary education	63	16.4
Tertiary	45	11.7
Mother's religious beliefs		
Christian	333	86.7
Islam	51	13.3

3.2. ANTENATAL AND POSTNATAL HISTORY

Antenatal care clinic was attended by 82% of the postnatal mothers interviewed. The median gestational age at first ANC visit was 3 months (IQR 2 – 4). Multiparous mothers were 70% while primiparous accounted for 30% of mothers interviewed. Vaginal deliveries accounted for 84.4% while Caesarean sections were 15.6%. Male deliveries accounted for 54% while females were 46%. Majority of the mothers 71.4% were discharged within hours after delivery while 28.6% discharged days after delivery. (Table in Appendix 7)

3.3. EDUCATION ON NEWBORN CARE

The majority of the newborn care education was given during antenatal care period (63.5%) compared to 55% at postnatal period. Table 2 shows newborn care education was provided mostly by nurses and midwives in both antenatal and postnatal periods, only 16% was provided by the families and friends during postnatal period. As regard to the newborn care information received, 61.2% of mothers received education on breastfeeding during antenatal period with 54.4% postnatally. Two thirty two (60.4%) of mothers obtained information on cord care antenatally while 53.9% postnatally. Maternal information on immunization during both antenatal and postnatal periods was 54.7% and 53.1% (54.7%) respectively as in table 2.

Table 2: Education on newborn care

Variable	**During pregnancy**	**After delivery**
Education on newborn care		
Yes	244 (63.5%)	210 (55%)
No	140(36.5%)	174 (45%)
Information provided by:		
Doctor	12 (5 %)	20 (10%)
Nurse/midwives	232 (95%)	156 (74%)
Family/friends	0 (0.0%)	34 (16%)
Essential newborn care information received:		
Cord care	232 (60.4 %)	207 (53.9%)
Thermoregulation	180 (46.9%)	193 (50.3%)
Breastfeeding	235 (61.2%)	209 (54.4%)
Immunization	210 (54.7%)	205 (53.1%)
Eye care	165 (42.9%)	193 (50.3%)
Signs of serious illness in newborn	219 (57%)	199 (51.8%)

Table 2 showed provision of education on thermoregulation was low both antenatally and postnatally at 46.9% and 50.3% respectively. In addition, provision of education on eye care was also low at 49.9% and 50.3% in both the antenatal and postnatal periods respectively. Maternal

education on signs of serious illness during both the antenatal and postnatal periods was at 57% and 51.8% respectively.

3.4. KNOWLEDGE ON ESSENTIAL NEWBORN CARE

3.4.1. Cleanliness and cord care

Among the mothers interviewed, only 18.2% correctly reported that umbilical stump should be uncovered as shown in table 3. Three-quarters (75.3%) of postnatal mothers believed that clean water could be used to clean soiled umbilical stump while 24.7% believed spirit could be used. One hundred and forty five (37.8%) of mothers reported that substances could be applied to the umbilical stump after cleaning, the frequently applied substances identified by the mothers were powder (43%), ashes (14.4%), oil and alcohol at 2.8% and 2.8% respectively.

3.4.2. Thermoregulation

Table 3 shows the modes of keeping the baby warm identified by the mothers. Warm clothing was identified by 90.4%. Rooming in was identified by 85.2% of mothers. Maternal knowledge on delayed bathing as a method of thermoregulation was low with 44.1% of mothers reported that baby should be bath hours after delivery, 49.1% afters some days and 6.8% didn't know of this mode for thermoregulation.

Table 3: Knowledge on newborn cleanliness, cord care and Thermoregulation

Cord care and cleanliness	Frequency (n)	Percent (%)
Umbilicus stump should be		
Covered	295	76.8
Uncovered	70	18.2
Don't know	14	3.6
Soiled umbilicus stump should be		
Clean with water	289	75.3
Clean with saliva	0	0
Apply alcohol or spirit	95	24.7
The cord should be left clean and dry without applying substance		
Yes	208	54.1
No	145	37.8
Don't know	31	8.1
Thermoregulation		
Baby is kept warm after delivery by		
Skin to skin contact	128	33.3
Wrapping baby in a cloth	347	90.4
Duration between birth and first bath		
Hours	169	44.1
Days	188	49.1
Don't know	26	6.8
Baby should be nursed in the same room as mothers		
Yes	327	85.2
No	28	7.3
Don't know	29	7.6

3.4.3. Breastfeeding knowledge

Table 4 shows that 90.1% of mothers knew about breastfeeding on demand, 82% reported that prelacteal feeds should not be given to the baby. Duration of exclusive breastfeeding for 6 months was reported by 80.5% of mothers and colostrums should be given to the babies was reported by 83.9 % of the mothers.

Table 4: Knowledge on Breastfeeding and Immunization

Breastfeeding	**Frequency (n)**	**Percent (%)**
Prelacteal feeds should be given to baby		
Yes	49	12.8
No	315	82
Not known	20	5.2
Duration of exclusive breastfeeding		
< 6 months	30	7.8
6 months	309	80.5
>6 months	30	7.8
Don't know	15	3.9
Breastfeeding should be given on demand		
Yes	346	90.1
No	38	9.9
Colostrums should be given to the baby		
Yes	322	83.9
No	62	16.1
Immunization		
Your baby require vaccine at birth		
Yes	352	91.7
No	4	1
Don't know	28	7.3
Vaccines are given to prevent disease in your baby		
Yes	311	81
Not known	73	19
Birth vaccines known to mothers		
BCG	80	20.8
OPV	79	20.6
None	288	75.0
Disease prevented by vaccine given in the left forearm at birth (BCG)		
Known	190	49.5
Not known	194	50.5
Disease prevented by vaccine given orally at birth (OPV)		
Known	226	58.9
Not known	158	41.1

3.4.4. Immunization knowledge

Table 4 shows that 91.7% of mothers were aware of the need for immunization at birth while 81% knew that vaccine prevent disease. Only 20.8 % and 20.6% of mothers knew BCG and OPV respectively.

3.4.5. Eye care knowledge

Figure 3 shows that mothers mostly (97.4%) associated eye discharge with eye infection. There were (66.9%) mothers who knew that reddening of eyes was a sign of eye infection and (36.7%) were aware that eye infections could manifest as swollen eyes.

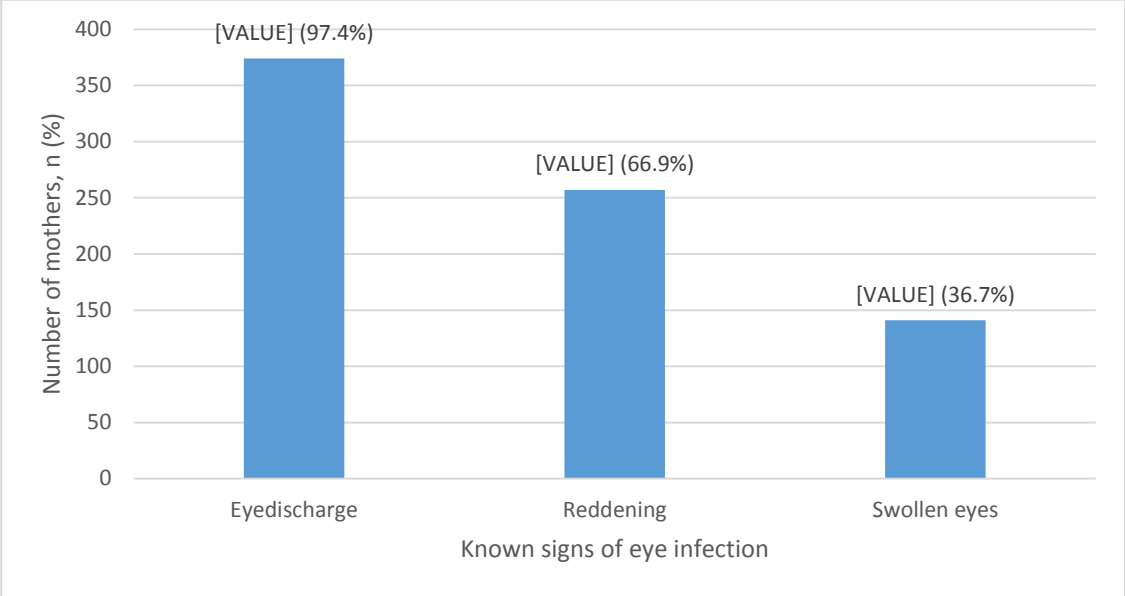


Figure 3: Knowledge on eye care

3.4.6. Signs of serious illness in newborn

Table 5 shows signs of serious illness identified by the mothers, although 94.3% of mothers recognised fever as a sign of serious illness only 41.1% recognized hypothermia. More than 80% of mothers recognised diarrhea, vomiting and refusal to breastfeeding as signs of serious illness in newborn. Signs of ophthalmia neonatorum were identified by 52.1%, decrease activity was identified by 59.4% and difficulty in breathing was 90.4%. Three hundred and two (78.6%) and 276(71.9%) identified convulsions and irritability as signs of serious illness respectively.

Table 5: Signs of severe illness in new born

	Frequency (n)	**Percent (%)**
Yellowness of eye, palms and soles	306	79.7
Umbilicus red, discharging pus, surrounding skin red	278	72.4
Eye swollen, sticky, red or draining pus	200	52.1
Baby stops breastfeeding	343	89.3
Abnormal jerking movement of limbs and eyes	302	78.6
Difficulty in breathing	347	90.4
Fever	362	94.3
Baby cold to touch	159	41.4
Baby previously active becomes lethargic	228	59.4
Abdominal distension	264	68.8
Diarrhoea	332	86.5
Vomiting	336	87.5
Cries excessively/irritable	276	71.9

3.5. PRACTICES ON ESSENTIAL NEWBORN CARE

Table 6 shows practices towards the various aspects of newborn care. Mothers were noted to have positive practice towards cord care, 85.1% and 82.3% of mothers agreed that previously used razor blades should not be used to cut the cord and that a dirty cord could cause infection respectively.

Table 6: Practices towards essential newborn care

	Agree	**Neutral**	**Disagree**
Cleanliness and cord care	**n (%)**	**n (%)**	**n (%)**
A previously used razor blade can be washed and used to cut the cord	50(13.1)	7(1.8)	326(85.1)
A dirty umbilical cord can cause infection in your baby	316(82.3)	57(14.8)	11(2.9)
Thermoregulation			
Babies can be covered with clothes to prevent heat loss	373(97.1)	3(0.8)	8(2.1)
Mother-baby skin to skin contact prevents the baby from getting cold	218(56.8)	140(36.5)	26(6.8)
The baby can be bathed within the first day of life	159(41.4)	50(13.0)	175(45.6)
Breastfeeding			
The baby should be breastfed at night	349(91.1)	4(1.0)	30(7.8)
Mixed feeds should not be practiced	320(83.3)	24(6.3)	40(10.4)
Eye care			
Substances (apart from those prescribed by doctor) can be applied to infected eye	77(20.1)	34(8.9)	273(71.1)

Regarding thermoregulation only 56.8% of mothers believed that heat loss could be prevented by skin to skin contact. Almost all mothers (97%) agreed that heat loss could be prevented by covering the baby with clothes as shown in table 6.

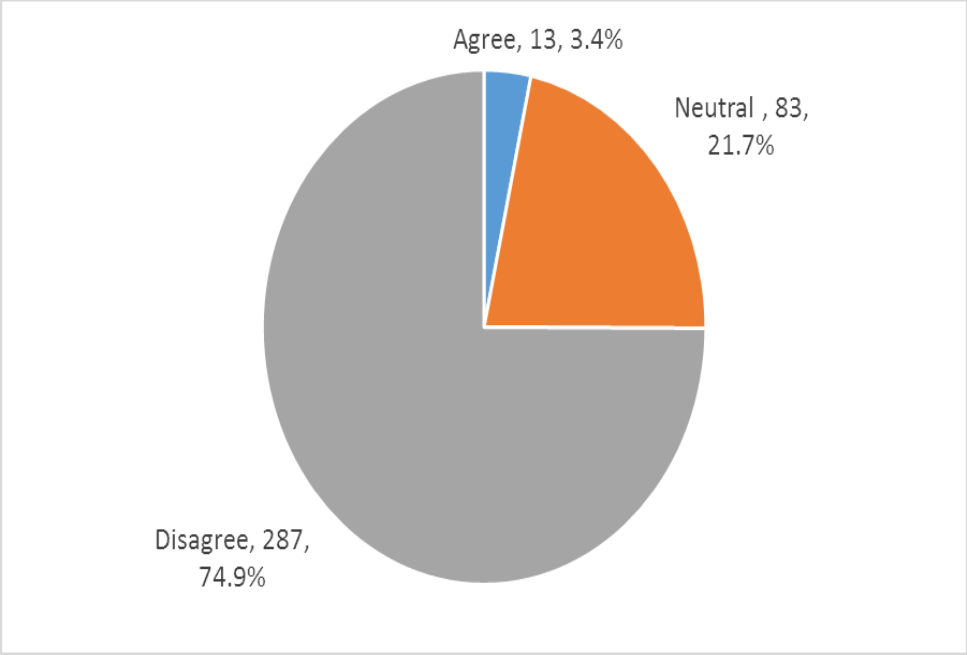
Mothers were found to have positive practices towards breastfeeding with 91.1% agreeing that babies should be breastfed at night and 83.3% reported that no prelacteal feeds should be given as shown in table 6.

Table 6 shows mothers negative practice towards eye care with 20.1% agreeing to applied substances to the eyes apart from those prescribed by a doctor if they noted eye discharge, reddening and swollen. Two hundred and seventy three (71.1%) mothers disagreed to applied substances to the cord.

3.5.1. Immunization Practices

Figure 4 Shows mothers practice towards immunization, only 13(3.4%) of mothers believed that vaccines would be harmful to the babies while 21.7% were unsure.

Figure 4: Immunization practices



3.6. FACTORS ASSOCIATED WITH MATERNAL KNOWLEDGE ON ESSENTIAL NEWBORN CARE

A multivariable logistic regression model was used to examine the null hypothesis of no association between maternal characteristics (namely age, employment, formal education, ANC attendance and receiving health provider information before and after delivery) and maternal knowledge on essential newborn care. The dependent variable was essential newborn knowledge coded as follows: 0 = inadequate knowledge, 1 = adequate knowledge and the maternal characteristics were included in the multivariable model as independent (explanatory) variables.

The findings showed that maternal knowledge on essential newborn care was significantly associated with receiving information on essential care from a provider during ANC (p =< 0.001) and post-delivery (<0.001), Table 7. Postnatal mothers who received information on essential newborn care from the health care provider during ANC were three times more likely to have adequate knowledge compared to those who reported not to have received essential newborn care information during ANC (AOR 3.49[95% CI 1.99-6.12], p = <0.001).

Similarly, postnatal mothers who received essential newborn care information by the health care provider after delivery were two times more likely to have adequate knowledge compared to those who did not received information after delivery (AOR 2.48 [95% CI 1.52-4.06], p <0.001).

Table 7: Factors associated with maternal knowledge on essential newborn care

Variables	Adequate knowledge on essential newborn care*		Unadjusted bivariable analysis	
	Yes (n = 101)	No (n = 283)	OR (95 % CI)	P
Maternal age				
16-18 years	1(1.0)	24(8.5)	0.14(0.02-1.11)	0.063
19-24 years	30(29.7)	104(36.7)	1.00(Ref)	
25-34 years	59(58.4)	114(40.3)	1.79(1.07-3)	0.026
35-45 years	11(10.9)	40(14.1)	0.95(0.44-2.08)	0.905
Employment status				
Employed	51(50.5)	106(37.5)	1.00(ref)	
Unemployed	50(49.5)	177(62.5)	0.59(0.37-0.93)	0.023
Level of formal education				
No formal education	13(12.9)	49(17.3)	1.00(ref)	
Some primary education	15(14.9)	53(18.7)	1.07(0.46-2.47)	0.88
Complete primary education	6(5.9)	48(17.0)	0.47(0.17-1.34)	0.159
Some secondary education	19(18.8)	72(25.4)	0.99(0.45-2.20)	0.989
Complete secondary education	21(20.8)	42(14.8)	1.88(0.84-4.22)	0.123
Tertiary	27(26.7)	18(6.4)	5.65(2.41-13.28)	<0.001
Attendance of ANC				
Yes	95(94.1)	220(77.7)	1.00(ref)	
No	6(5.9)	63(22.3)	0.22(0.09-0.53)	0.001
Provided information during ANC				
Yes	83(82.2)	161(56.9)	3.49(1.99-6.12)	<0.001
No	18(17.8)	122(43.1)	1.00(ref)	
Parity				
Primigravid	20(19.8)	95(33.6)	1.00(Ref)	
Multiparous	81(80.2)	188(66.4)	2.05(1.18-3.54)	0.01
Number of ANC visits				
< 4 visits	31(30.7)	138(48.8)	1.00(Ref)	
4 or more visits	70(69.3)	145(51.2)	2.15(1.33-3.48)	0.002
Receive information after delivery				
Yes	72(71.3)	138(48.8)	2.48(1.52-4.06)	<0.001
No	29(28.7)	138(48.8)	1.00(ref)	

*Adequate knowledge in 3 or more of the 6 areas of essential newborn care (cord care, breastfeeding, thermoregulation, eye care, immunization, neonatal illness signs)

Variables that showed statistically significant association with maternal knowledge (< 0.05) were included in multivariable logistic regression model. Provision of essential newborn care information during ANC and after delivery and mothers parity were found to be independently associated with inadequate knowledge among mothers (Table 8). It did not reveal any association between ANC attendance, number of ANC visits and employment status of the mothers.

Table 8: Multivariable logistic regression of factors associated with maternal knowledge on essential newborn care

	Odds Ratio	**P**	**95% CI**	
Employment status				
Employed	1.0 (ref)			
Unemployed	0.62	0.064	0.37	1.03
Parity				
Primiparas				
Multiparas	2.13	0.013	1.17	3.86
Number of ANC visits				
< 4 visits				
4 or more visits	3.76	0.347	0.24	59.53
Attendance of ANC				
Yes	1.0(ref)			
No	2.06	0.589	0.15	28.62
Provided information during ANC				
Yes				
No	2.55	0.009	1.26	5.17
Receive information after delivery				
Yes				
No	3.13	<0.001	1.83	5.33

4.0. DISCUSSION

To reduce neonatal morbidity and mortality mothers needed to be equipped with correct knowledge on essential newborn care practices. Our study found that less than two third of the mothers received newborn care education during antenatal care visits. The main source of information on newborn care were medical personnel mainly midwives and nurses rarely medical doctors due to lack of enough medical doctors to run the antenatal care clinic. The importance of this was shown by Sineu, E. et al who demonstrated that health education information from a skilled health provider optimizes mother and newborn health, promote healthy behaviour and health household practice [29].

The essential newborn care components studied were cord care, thermoregulation, breastfeeding immunization, eye care and signs of serious illness in newborn. WHO advocates for hygienic practices while handling the cord of the newborn which is a common source of neonatal infection and use of chlorhexidine in areas with high neonatal mortality rates[7]. The importance of chlorhexidine use for cord care was shown by Imdad A. et al in Pakistan who demonstrated a significant reduction in umbilical cord infection and all cause of neonatal mortality among home deliveries [30].

Our study revealed that majority of the mothers had inadequate knowledge on cord care, the findings of the study were inconsistent with Amolo's study in Kenyatta National Hospital who found majority of the mothers had adequate knowledge on cord care [19]. The variation in the views among mothers was likely due to lack of consensus among health care providers on the best practices of cord care.

In our study breastfeeding knowledge among mothers was encouraging with majority of mothers aware of breastfeeding on demand (90.1%), use of colostrums (83%) and exclusive breastfeeding (74%). These findings greatly suggest emphasis of health care providers on breastfeeding during antenatal care. Karen, E. et al in Ghana suggested that all cause of neonatal mortality could be reduced by 16% if breastfeeding is initiated on first day of life and by 2% if breastfeeding is initiated within the first hour of life [22].

Our study found that almost all mothers (91.7%) were aware of the need for vaccine at birth and the prevention benefits. Seventy five percent of the mothers could not however, identify the vaccines given at birth. Mothers scored poorly when asked to match the vaccine with the disease it prevented. These findings suggest poor dispersion of immunization information by the health care providers. The findings of the study were similar to Amolo study in Kenyatta National Hospital who found 33% and 56% of mothers knew the disease prevented by BCG and OPV respectively[19].

This study found that mothers were less aware of kangaroo (skin to skin contact) as a method of thermoregulation in newborn and this was due to inadequate dissemination of information on thermoregulation by the health care provider during both antenatal and postnatal period. Our study also found that 41.4% of the mothers had negative practice on WHO recommendation on delaying bath as a method of thermoregulation and this was due to some cultural beliefs that baby is covered with a dirty material from the womb. This finding is slightly higher than Sri Lankan study which found 34 % of mothers had negative practice [16].

The study also found that more than half of the mothers had negative practices towards cord care; this finding was consistent with Monebenimp et al in Cameroon who also reported that more than half of the mothers had negative practices towards cord care [31].

Our study found that mothers had positive practices towards breastfeeding with most of the mothers agreeing with WHO recommended breastfeeding practices. These findings were inconsistent with Rehana et al study who found 73% of the mothers had given prelacteal feeds and exclusive breastfeeding rate was 26% [24]. Kloeblen-Tarver et al showed a direct correlation between maternal practices and optimal breastfeeding practices [32].

Our study also found the information on the signs of serious illnesses in newborn was not adequately disseminated to mothers both antenatally 57% and postnatally 51.8%. The information given to the mothers during antenatal care in my study was much higher than Upul Senarath et al study who found only 11% of Sri Lankan mothers were given information on signs of serious illness in newborn [33]. Our study findings were also much higher than Amolo's study which showed only 8.7 % and 1.6 % mothers received information on the signs of serious illness during ANC and after delivery respectively [19].

Recognition of the signs of serious illness in newborn by the mothers had been shown to be of great concern in several developing countries [34]. In our study the signs of serious illness in newborn identified by the mothers were fever, difficulty in breathing, inability to feed, vomiting, diarrhoea, jaundice and abnormal jerk movement, signs of ophthalmia neonatorum. Hypothermia was only identified by 41.4 % compared to study done by Gathoni which revealed none of the mothers had identified hypothermia as a sign of serious illness in newborn [35].

Almost all of the mothers (94.1%) recognized hyperthermia as a sign of serious illness which is slightly higher than Gathoni's study where 89.1% mothers recognized hyperthermia as a sign of serious illness in newborn. In our study failure to identified hypothermia as a sign of serious illness in newborn could be explained by the poor dissemination of the information in both antenatal and postnatal period.

Lack of maternal education on essential newborn care during antenatal and postnatal periods and parity of the mothers were found to be independent predictors of inadequate knowledge among postnatal mothers. The findings in our study were inconsistent with Upul Senarath et al study in Sri Lanka which showed no association between antenatal care visits and maternal knowledge[33].The main conclusion from the findings is that antenatal care clinics provide an opportunity to educate mothers on essential newborn care which leads to sustained knowledge in the postnatal period.

5.0. CONCLUSIONS

1. Postnatal mothers were most knowledgeable on breastfeeding and signs of serious illness. Knowledge gap was found to exist towards cord care, eye care, thermoregulation and immunization.
2. Postnatal mothers had positive practices towards breastfeeding, eye care, immunization, cord care with negative practices towards thermoregulation.
3. Socio-demographic factors were not associated with inadequate maternal knowledge.

5.1. RECOMMENDATIONS

1. Essential newborn care information should be provided to mother during both antenatal care and postnatal period.
2. More emphasis is needed in maternal education during antenatal care towards cord care, eye care thermoregulation and immunization.
3. A qualitative study is recommended to elaborate more on newborn care knowledge and practices among mothers in South Sudan.

5.2. DISSEMINATION OF RESULTS

The result will be published in South Sudan Medical Journal and a copy will be hand in the following:

- Department of Newborn Ministry of Health /ROSS.
- Library, University of Nairobi
- Department of paediatrics, University of Nairobi

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APPENDICES

APPENDIX I : QUESTIONNAIRE

ON KNOWLEDGE AND PRACTICES ON ESSENTIAL NEWBORN CARE AMONG POSTNATAL MOTHERS AT JUBA TEACHING HOSPITAL

Study identification Number :…… Date……..

A. SOCIODEMOGRAPHHIC CHARACTERISTICS OF THE MOTHER

Tick the appropriate response

1. Mother's age in years …….
2. Marital Status

Single	Married	Separated	Divorced

3. Father's age in years …….
4. Mother's occupation

	Employed		Unemployed

5. If employed

Professional	Domestic Services	Skilled Manual	Unskilled Manual	Farming	Small Scale Business

6. Mother's education level

	No formal education
	Some Primary education
	Complete primary Education
	Some Secondary education
	Complete Secondary Education
	Tertiary

7. Mother's Religious Belief

Christian	Islam	Atheist	Other (Specify)

B. ANTENATAL AND BIRTH HISTORY

Tick appropriate response

1. Neonate's gestation in weeks……..
2. Neonate's birth weight in kilogrammes…….…….
3. Neonate's sex

	Male		Female

4. Mother's parity……..
5. Did you attend antenatal clinic during this pregnancy?

	Yes
	No (Skip to Q.8)

6. How many ANC visits did you attend? .....
7. How far along was your pregnancy when you first attended ANC (in months)? .....
8. Did you receive tetanus injections during this (or your previous) pregnancy?

Yes	No	Don't know

9. How did you deliver?

	Spontaneous vertex delivery
	Caesarean section
	Others

10. How long after delivery were you discharged?

	Hours
	Days

C. EDUCATION ON NEWBORN CARE

1. Did you receive any education on new-born care practices during this pregnancy?

	Yes
	No (go to Q.4)

2. What information were you provided on?

	Breastfeeding
	Cord care
	Eye care
	Thermoregulation
	Immunisation
	Signs of serious illness in newborn

3. Who provided you with the information?

	Doctor
	Nurses
	Midwife

4. Have you received any new-born care education since you delivered this baby?

	Yes(go to Q.5)
	No (proceed to next section)

5. Who provided you with information?

Doctor	Nurse/Midwife	Family	Other (Specify)

6. What information were you provided on?

	Breastfeeding
	Cord care
	Eye care
	Thermoregulation
	Immunisation
	Sign of serious illness in new-born

D. THERMOREGULATION KNOWLEDGE

1. How can you keep your baby warm after delivery?

	Skin to skin contact
	Wrapped the baby in a cloth
	Other (specify)

2. How long would you take before you give your baby the first bath after delivery?

Minutes	Hours	Days	Don't know

3. Would your baby be nursed separately from you after delivery?

Yes	No	Don't know

PRACTICES

	Agree	Neutral	Disagree
4. Babies can be cover with clothes to prevent heat loss			
5. Mother-baby skin to skin contact prevents the baby from getting cold			
6. Your baby can be bath within the first day of life			

E. CLEANLINESS AND CORD CARE KNOWLEDGE

1. How would you care for the umbilical stump of your baby?

	Covered
	Uncovered
	Don't know
	Others (specify)

2. If the umbilical stump is soiled with baby's urine or faeces, how would you clean it?

	Clean with water
	Clean with saliva
	Apply alcohol or spirit
	Others (specify)

3. After cleaning your baby's soiled umbilical stump, would you apply any substance to it?

Yes	No	Don't know

4. If yes, what material would you apply on your baby's umbilical stump?

	Surgical spirit
	Alcohol
	Saliva
	Cow dung
	Others (specify)

PRACTICES

	Agree	Neutral	Disagree
5. A previously used razor blade can be washed and used to cut the cord			
6. A dirty umbilical cord can cause infection in your baby.			

F. BREASTFEEDING KNOWLEDGE

1. How soon after delivery did you start to breastfeed your baby?

	Minutes
	Hours
	Don't know

2. Did you (or anyone else) give any fluid/feeds to your baby before breastfeeding for the first time?

	Yes
	No
	Don't know

3. How often would you breastfeed your baby

	On demand (when baby cries looking for breast)
	According to timetable
	Other (specify)

4. How long can you exclusively breastfeed your baby (in months)……..
5. What would you do with the first milk (colostrums) that came from your breast?

	Feed the baby (go to Q.7)
	Threw it away (go to Q.6)
	Other (specify)- (go to Q.6)

6. Why wouldn't you give your baby the first milk? ……

PRACTICES

	Agree	Neutral	Disagree
7. Your baby can be breastfed at night.			
8. Your baby can be given other feeds/fluids apart from breast milk.			

G. IMMUNIZATION KNOWLEDGE

1. Does your baby require any vaccination at birth?

Yes	No	Don't know

2. Why do we give vaccines to the baby after birth?

Prevent diseases	Don't know	Other (specify)

3. What vaccines can your baby receive at birth?

	BCG
	OPV
	Don't know
	Other (specify)

4. What disease does a BCG vaccine protects your baby from?

	Tuberculosis
	Don't know
	Other (specify)

5. What disease does OPV vaccine protect your baby from?

	Polio
	Don't know
	Other (specify)

PRACTICE

	Agree	Neutral	Disagree
6. Vaccines are harmful to your baby?			

7. If you agree, how do they harm your baby? .....

H. EYE CARE KNOWLEDGE

1.Are you aware of any signs that would make you know your baby has an eye infection?

	Eye discharge
	Reddening of eye
	Swollen eye
	Other (specify)

PRACTICE

	Agree	Neutral	Disagree
1. Would you apply any substances (apart from those prescribed by a doctor) to your baby's eye if you noted discharge, reddening or swelling?			

2. If you agree what would you apply to your baby's eye?

	Breast milk
	Cow dung
	Saliva
	I don't know
	Other (specify

I. DANGER SIGNS IN NEONATE

How would you know if your baby has serious illness?

	Response
Yellowness of eye, palms and soles	
Umbilicus red, discharging pus, surrounding skin red	
Eye swollen, sticky, red or draining pus	
Baby stops breastfeeding	
Abnormal jerking movement of limbs and eyes	
Difficulty in breathing	
Fever	
Baby cold to touch	
Baby previously active becomes lethargic	
Abdominal distension	
Diarrhoea	
Vomiting	
Cries excessively/irritable	

Thank you for your participation

التذييل 1: الاستبيان عن التذييل 1: الاستبيان عن

المعرفة والممارسات الأساسية ورعاية حديثي الولادة بين الأمهات بعد الولادة بمستشفى جوبا التعلمي في جنوب السودان

رقم تميز الدراسة:..... تاريخ :.....

A.الخصائص

وضع علامة في الرد المناسب

1. سن الأم في السنوات.....

2.الحالة الاجتماعية

أعزب	متزوج	مطلق	مطلق

3 . سن الأب في السنوات.....

4 .مهنة الأم

عاملة	عاطلة

5. إذا العاملين

مواظفة	الخدمات المنزلية	المهنية المهرة دليل	غير المهرة دليل	المزارع الصغيرة	الشركة

6. مستوى التعليمالأم

	أي تعليم رسمي
	بعض التعليم الابتدائي
	التعليم الابتدائي الكامل
	بعض التعليم الثانوي
	كامل التعليم الثانوي
	القطاع الثالث

7. المعتقد الديني الأم

المسحية	الإسلام	الملحد أخرى (حدد)

B. قبل الولادة والولادة

1. الحمل الوليد في الاسابيع ....

2. الوزن عند الولادة الوليد في كجم ....

3. الجنس الوليد

ذكر	أنثى

4. التكافؤ الأم..... ....

5. هل حضور عيادة ما قبل الولادة أثناء هذا الحمل؟

	نعم
	لا (انتقل إلىQ.8)

6. كم العديد من الزياراتANC حضرتي؟..... .....

7. كان مدى طول فترة حملك عند حضر لأول مرةANC(في أشهر)؟ .....

8. هل تلقيت حقن الكزاز خلال هذه (أو الخاص السابق) الحمل؟

نعم	لا	لا أعرف

9. كيف يسلم؟

	عفوية تسليم قمة الرأس
	عملية قيصرية
	آخرون

10. متى بعد الولادة وتؤدون؟

	ساعات
	أيام

C. التربية والتعليم على رعاية الأطفال حديثي الولادة

1. هل تلقيت أي تعليم على ممارسات الرعاية حديثي الولادة خلال هذا الحمل؟

	نعم
	لا (اذهب إلىQ.4)

2. ما هي المعلومات التي تم قمت بتوفيره على؟

	الرضاعة الطبيعية
	الرعاية الحبل
	العناية بالعين
	الحراري
	التطعيم
	علامات مرض خطير في المولود الجديد-
	رعاية انخفاض الوزن عند الولادة
	أخرى (حدد)

3. من تقدم لك هذه المعلومات؟

	طبيب
	الممرضات
	قابلات

4. هل تلقيت أي تعليم رعاية المولود منذ أن ألقى هذا الطفل؟

	نعم (اذهب إلىQ.5)
	لا (انتقل إلى القسم التالي)

5. من تزويدك المعلومات؟

طبيب	ممرضة	قابلة عائلي	أخرى (حدد)

6. ما هي المعلومات التي تم قمت بتوفيره على؟

	الرضاعة الطبيعية
	الرعاية الحبل
	العناية بالعين
	الحراري
	التطعيم
	علامة على مرض خطير في المولود الجديد-
	رعاية انخفاض الوزن عند الولادة
	أخرى (حدد)

D. الحراري المعرفة

1. كيف يمكنك تدفئة طفلك بعد الولادة؟

	الجلد لملامسة الجلد
	لف الطفل في قطعة قماش
	أخرى (حدد)

2. كم كنت تأخذ قبل أن تعطي طفلك الحمام الأول بعد الولادة؟

دقائق	ساعات	أيام	لا أعرف

3. هل يمكن رعت طفلك بشكل منفصل منك بعد الولادة؟

نعم	لا	لا أعرف

الممارسات

	أوافق	محايد	لا أوافق
4. يمكن أن يكون الأطفال غطاء مع الملابس لمنع فقدان الحرارة الجلد			
5. الأم والطفل لملامسة الجلد يمنع الطفل من الحصول على البرد			
6. يمكن أن يكون حمام طفلك خلال اليوم الأول من الحياة			

E. النظافة و المعرفة

1. كيف رعاية الجذع السري لطفلك؟

مغطى	مكشوف	لا أعرف

2. إذا تم المتسخة الجذع السري مع البول أو البراز الطفل، كيف تنظيفه؟

	نظيفة مع الماء
	نظيفة مع اللعاب
	تطبيق الكحول أو روح
	أخرى (حدد)

3. بعد تنظيف المتسخة جدعة طفلك السري، هل تطبيق أي مادة إلى ذلك؟

	نعم	لا	لا أعرف

4. إذا كانت الإجابة بنعم، ما هي المواد من شأنه تطبيق على جذع طفلك السري؟

روح الجراحية	كحول	لعاب	روث البقر	أخرى (حدد)

الممارسات

	أوافق	محايد	لا أوافق
5. تستخدم في السابق شفرة حلاقة يمكن غسلها واستخدامها لقطع الحبل			
6. الحبل السري القذرة يمكن أن يسبب عدوى في طفلك.			

F. الرضاعة الطبيعية المعرفة

1. كيف قريبا بعد الولادة سوف تبدأ في إرضاع طفلك؟

دقائق	ساعات	لا أعرف

2. هل أنت (أو أي شخص آخر) يعطي أي السائل / يغذي لطفلك قبل الرضاعة لأول مرة؟

نعم	لا	لا أعرف

3. كم مرة هل إرضاع طفلك

	على الطلب (عندما يكون الطفل يبكي تبحث عن الثدي)

	وفقا لجدول زمني
	أخرى (حدد)

4. متى يمكنك إرضاع طفلك بشكل حصري (في أشهر)؟ ....

5. ما يمكن أن تفعله مع الحليب الأول (اللبأ) التي جاءت من الثدي؟

	إطعام الطفل (اذهب إلىQ.7)
	رمى به بعيدا (اذهب إلىQ.6)
	أخرى (حدد) - (اذهب إلىQ.6)

6. لماذا لا تعطي طفلك الحليب الأول؟ .....

الممارسات

	أوافق	محايد	لا أوافق
7. يمكن أن الرضاعة الطبيعية طفلك في الليل.			
8. يمكن إعطاء طفلك الأعلاف الأخرى / السوائل بصرف النظر عن حليب الثدي.			

G. التمنيع المعرفة

1. هل يحتاج طفلك أي تطعيم عند الولادة؟

نعم	لا	لا أعرف

2. لماذا لا نعطي لقاحات للطفل بعد الولادة؟

الوقاية من الأمراض	لا أعرف	أخرى (حدد)

3. ما قاحات يمكن الحصول طفلك عند الولادة؟

BCG	OPV	لا أعرف	أخرى (حدد)

4. ما مرض لا لقاحBCGيحمي طفلك من؟

مرض السل	لا أعرف	أخرى (حدد)

5. ما المرض لا قاحOPVحماية طفلك من؟

شلل الأطفال	لا أعرف	أخرى (حدد)

الممارسة

	أوافق	محايد	لا أوافق
6. اللقاحات هي ضارة لطفلك؟			

7. إذا كنت توافق، كيف أنها تضر طفلك؟ ....

H. المعرفة

1. هل أنت على علم من أي علامات من شأنها أن تجعلك تعرف طفلك مصاب بالتهاب في العين؟

التفريغ العين	احمرار العين	العين منتفخة	أخرى (حدد) الممارسة

	أوافق	محايد	لا أوافق
2. المواد (عدا تلك التي ينص عليها الطبيب) يمكن أن تطبق على العين طفلك إذا لاحظ التفريغ، احمرار أو تورم			

3. إذا كنت توافق على ما يمكن أن تقوم بتطبيقها على عين طفلك؟

حليب الثدي	روث البقر	لعاب	أخرى (حدد)

I. خطر اللافتات في الوليد

1. كيف يمكنك معرفة ما إذا كان طفلك يعاني من مرض خطير؟

	استجابة
اصفرار العين والراحتين والأخمصين	
السرة الأحمر، وتفريغ القيح، المحيطة الجلد الأحمر	
عين متورمة، لزجة، أحمر أو استنزاف القيح	
طفل توقف الرضاعة الطبيعية	
حركة الرجيج غير طبيعية من الأطراف والعيون	
صعوبة في التنفس	
حمى	
طفل البرد للمس	
طفل نشاطا سابقا يصبح السبات العميق	
انتفاخ البطن	
الإسهال	
قيء	
يبكي بشكل مفرط / تعكر المزاج	

شكرا لمشاركتكم

APPENDIX II :CONSENT INFORMATION FOR THE STUDY

Study identification number…….Date……..

STUDY TITLE

Knowledge and practices on essential newborn care among postnatal mothers at Juba Teaching Hospital South Sudan.

PRINCIPAL INVESTIGATOR

CANDIDATE

Dr. Lucy.A.Meseka

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Mobile phone: +254 774462291(Kenya)/+211956446963 (South Sudan)

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SUPERVISORS

1. Dr.Mungai, Lucy N.Wainaina

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2. Prof. Rachel N. Musoke

   Professor, Department of Paediatric and Child Health, School of Medicine,

   University of Nairobi, Nairobi, Kenya,

   E-mail: rachel.musoke@uonbi.ac.ke

INVESTIGATOR STATEMENT

I am currently a postgraduate student in the University of Nairobi, Department of Paediatric.

The purpose of this statement is to request you and your baby to participate in my research study. The consent form is to give you information that you may need to help you decide whether to participate in the study. Please read this form carefully and you are free to ask any questions about the study. The investigator will be available to answer any questions that arise during the study and afterwards.

OBJECTIVE OF THE STUDY

The objective was to assess the knowledge and practices on essential newborn care towards cord care, immunization, thermoregulation, eye care, initiation breastfeeding, recognition of the signs of serious illness in newborn among postnatal mothers and to determine socio-demographic factors associated with maternal knowledge and practices on essential newborn care at Juba Teaching Hospital.

CONFIDENTIALITY

Any information provided was held in strict confidentiality and was only used for the purpose of this study.

BENEFITS

Any mother who was found to be lacking knowledge on essential newborn care practices was promptly educated. Any information that was pertinent to the care of the baby was promptly passed on to the primary medical doctor for intervention.

RISK OF THE STUDY

No invasive procedures or tissue sampling was obtained from the mother or baby as part of the study.

VOLUNTARISM

The study was fully voluntary and there was no any financial reward for participation. Participants were free to withdraw at any point during the study.

COMPENSATION

No compensation was offered for the participation in the study.

EXPECTED TIME IN THE STUDY

An exist interview was carried out once the primary caregiver discharged the mother and baby. No follow up interview or visit related to the study was required.

CONTACT INFORMATIONS

If you have any questions about the study or your participation in the study you can contact the principle investigator, Dr. Lucy .A. Meseka +211956446963 / +254 734462291.

If you have any questions on your rights you as a research participant you can contact the Kenyatta National Hospital Ethics and Research Committee (KNH/UON/ERC) by calling 2726300 Extension 44355.

التذييل 2: استمارة الموافقة على الدراسة

رقم تميز الدراسة:..... تاريخ :.....

عنوان الدراسة

المعرفة والممارسات الأساسية ورعاية حديثي الولادة بين الأمهات بعد الولادة بمستشفى جوبا التعلمي في جنوب السودان.

المحققون الرئيسية

الدكتورة لوسي أ. ميشيكا،
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البريد الألكتروني:cobiemeseka82@gmail.com

المشرفات\ المشرفين
الدكتورة (السيدة) لوسي ن وينانا مونجاى،
أستاذ محاضر (نظزم غذائية خاصة للاطفال قسم طب الاطفال صحة الطفل،
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الأستاذة راشيل موسوكي،
أستاذ في قسم طب الاطفال صحة الطفل،
كلية الطب، جامعة نيروبي،
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البريد الإلكتروني : rachel.musoke@uonbi.ac.ke

بيان المحقق

أنا حاليا طالبة دراسات عليا في جامعة نيروبي، ادارة طب الاطفال. وأود أن أطلب إليكم و طفلك على الاشتراك في الدراسة. الغرض من هذه الدراسة هو الموافقة على إعطاء المعلومات التي قد تحتاج إلى المساعدة في تحديد ما إذا كانت المشاركة في الدراسة. يرجى قراءة هذا النموذج بعناية. يمكنك أن تسأل أي أسئلة حول الدراسة. المحقق سوف تكون على استعداد للرد على الأسئلة التي تنشأ أثناء الدراسة وما بعده

الهدف من الدراسة

والهدف من ذلك هو تقييم المعارف والممارسات الأساسية في رعاية الوليد رعاية سلك، والتحصين، ومراقبة تنظيم الحراري الرعاية، والرضاعة الطبيعية، التعرف على علامات الخطر، إلى تحديد العوامل الاجتماعية الديمغرافية التي تتداخل مع المعرفة و الممارسة الأمهات على رعاية حديثي الولادة بمستشفى جوبا

خصوصية

أي معلومات سوف تعقد في سرية تامة و لن تستخدم إلا لأغراض هذه الدراسة

فوائد

أي الأم الذي هو العثور على مفقودة في المعرفة الأساسية في ممارسات الرعاية على الفور تعليم.
أي معلومات ذات صلة رعاية طفلك على الفور إلى الطبيب الرئيسي

خطر من الدراسة

لا الإقتحامية أو عينة النسيج يتم الحصول عليها من أنت أو طفلك كجزء من الدراسة

الطوعية

المشاركة في هذه الدراسة هو عدم وجود مكاسب مالية. أنت حر إلى الانسحاب من الدراسة إذا كنت ترغب دون أي عقوبة

تعويضات

لا يكون التعويض المقدمة للمشاركة في الدراسة

الوقت المتوقع عن الدراسة

وكان هناك لقاء سوف يتم تنفيذها قبل مغادرة المستشفى مرة الرئيسية التصريف لقريب لك ولطفلك . لا تتابع المقابلات أو الزيارة تتعلق الدراسة سوف تكون مطلوبة

معلومات الاتصال

إذا كان لديك أي أسئلة حول الدراسة أو المشاركة في الدراسة يمكنك الاتصال مبدأ المحققة
الدكتورة لوسي أ.ميشيكا

التلفون الخليوي:734462291 254+ (كينيا) / 211956446963+(جنوب السودان)

البريد الألكتروني:cobiemeseka82@gmail.com

إذا كان لديك أي أسئلة على حقوقك في بحث مشترك يمكنك الاتصال على مستشفى كينياتا الوطني جامعة نيروبي لجنة أخلاقيات البحوث(KNH/UON/ERC)

APPENDIX III : CONSENT CERTIFICATE/FORM

I confirm that I have explained to the parent all relevant information about the study as indicated above.

Interviewer's signature…… Date……..…….….

I confirm that above study has been explained to me, I agree to participate in the study with my baby. I have had a chance to ask questions about the research, to which satisfactory answers have been given. I understand I can withdraw from the study at any time without any penalty.

Interviewee's signature…… Date……

التذييل 3:شهادة موافقة \استمارة

أؤكد أنني قد أوضحت إلى الوالد جميع المعلومات ذات الصلة عن الدراسة المذكورة أعلاه.

التوقيع الباحث العلمي:.....…… تاريخ :.....

أؤكد أن الدراسة المذكورة أعلاه قد تم شرح لي أوافق على الاشتراك في الدراسة. لقد كانت فرصة لي لطرح الأسئلة البحثية التي إجابات مرضية وأعتقد أن الانسحاب من الدراسة في أي وقت دون أي عقوبة.

التوقيع المستجيبة\ الشخصة التي تتم مقابلتها:…… تاريخ :.....

APPENDIX IV : COMPONENT OT THE ESSENTIAL NEWBORN CARE

1. **Early and exclusive breastfeeding**

   Breastfeeding should be started within an hour of delivery. Feeding should be as frequent as the baby demands without prelacteal feeds or other fluids and food. Knowledge on the importance of breastfeeding should be disseminated among families and communities as well as health workers and managers.

2. **Cleanliness and cord care**

   Clean delivery and clean cord care can be ensured everywhere in health facilities by policies and practices for prevention, detected and control of nosocomial infections and at home by strengthening standard of cleanliness.

3. **Thermoregulation**

   Simple measures such as warm delivery room, immediate drying of the baby and skin to skin contact with the mother prevents loss of body warmth. Birth attendants and families need to be instructed on how to rewarm babies that become hypothermia.

4. **Initiation of breathing, resuscitation**

   Birth asphyxia should be promptly recognized and management should follow the basic principles of resuscitation, aspiration of mouth and nostrils, end ventilation with positive pressure.

5. **Eye care: prevention and management of ophthalmia neonatorum**

   Eye prophylaxis involves cleaning the eye immediately after birth and applying either silver nitrate drops or tetracycline eye ointment within the first hour of birth. There must be early diagnosis and management of ophthalmia.

6. **Care of the low birth weight and/or preterm**

   Additional warmth, cleanliness and nutrition, early recognition and management of diseases in preterm and/or low birth weight.

7. **Immunization**

   At birth newborn BCG, OPV and Hepatitis B vaccine are recommended by WHO.

8. **Management of new-born illness**

   Major new-born illness should be recognized early both at home and at health facility so that the baby can be managed appropriately.

APPENDIX V : WORK PLAN

	TIME PERIOD										
ACTIVITY	Jan	Feb	Mar	Apr	May	Jun	July	Sep	Oct	Nov	Dec
Literature review and Concept development										××	
Written Research Protocol and 1st submission to KNH-REC	××										
2nd submission and corrections			××								
Final submission and expected approval				××							
Data collection							××				
Data analysis								××			
Report writing									××		
Submission of draft report										××	

APPENDIX VI : RESEARCH BUDGET PROPOSAL

S/N	PARTICULAR	DESCRIPTION	UNIT/S	UNIT COST IN KSHS	TOTAL COST IN KSHS
1	Computer	Lap top	1	50,000	50,000
2	Printer	Desk jet	1	15,000	15,000
3	Proposal development	Printing, photocopying and binding several proposal drafts	10	500	500
4	Data analysis	Statistician services	1	30,000	30,000
5	Typing, binding , photocopy of the final draft		1	20,000	20,000
6	Poster presentation		1	15,000	15,000
7	Publication		1	50,000	50,000
8	Transportation	Return air ticket to Juba South Sudan	1	56,000	56,000
9	Contingency 15%		1		46,200
	Total				**291,000**

APPENDIX VII : ANTENATAL CARE AND POSTNATAL HISTORY

	Frequency (n)	Percent (%)
Neonate's sex		
Male	207	54
Female	177	46
Parity		
Primiparus	115	30
Multiparous	269	70
ANC attendance during pregnancy		
Yes	315	82
No	69	18
Gestation at first visit		
0-3 Months	82	26
4-6 Months	179	56.8
7-9 Months	54	17.1
Number of ANC visits		
None	66	17.2
1-3	103	26.8
4 or more	215	66.0
Received tetanus injections		
Yes	353	91.9
No	31	8.1
Mode of delivery		
Spontaneous vertex delivery	324	84.4
Caesarean section	60	15.6
Duration between delivery and discharge		
Hours	274	71.4
Days	110	28.6