MOTHER'S KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING NEONATAL ILLNESS AND ASSESSMENT OF NEONATES AT KENYATTA NATIONAL HOSPITAL

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By

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Declaration

This dissertation is my original work and has not been submitted for the award of degree in any other university.

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Abbreviations

KNH: Kenyatta National Hospital

UON: University of Nairobi

MDG: Millennium Development Goals

KDHS: Kenya Demographic and Health Survey

FDG: Focus Group Discussion

ANC: Ante-natal clinic

MOH: Ministry of Health

Study definitions and operational terms

Neonate: A baby less than 28 days of age.

Neonatal illness: An unhealthy condition in a baby less than 28 days of age.

Neonatal sepsis: An infection in a baby less than 28 days.

Signs: An objective evidence of disease.

Abstract

Introduction: Neonatal mortality in Kenya remains high accounting for 42% of under 5 mortality. Neonatal infections account for 36% of these deaths. With two years to 2015, the millennium development goal four may not be achieved unless accelerated measures are put in place to reverse the trends. Early recognition of signs of illness in a neonate will lead to early seeking of care and avoid overt outcomes associated with late presentation and severe disease.

Objective: To determine the knowledge , attitude and practices towards recognition of danger signs of neonatal illness, among mothers delivering at Kenyatta National Hospital. A second objective was to determine the prevalence of ill health among the apparently well newborns in the maternity wards.

Study design: Descriptive cross sectional hospital based survey.

Study population and setting: Mothers and their babies in Kenyatta National Hospital's post natal wards.

Research methods: Qualitative and quantitative methods were used. For quantitative data a structured questionnaire was administered to the mothers and demographic, social and ante natal history was obtained. Qualitative data was obtained using focused group discussions. Six focus groups consisting of eight mothers each were conducted. They were interviewed on which signs of neonatal illness that they knew, which ones were regarded as severe, and immediate measures that would be taken for sick neonates. Information on cultural practices regarding care of sick neonates was also sought. Subsequently, the data was analysed. Summary tables were constructed for grouped data while means and medians were determined for continuous variables. Appropriate statistical computation was done using SPSS.

Results

A total of 384 mothers were interviewed and their babies assessed. The mean age of the mothers interviewed was 26.3 years of whom 89 % had post primary education, 72.7% were multipara and 64% had attended antenatal clinic for four or more times. Overall 97.7 % of the mothers knew at least one danger sign. There was poor knowledge of convulsions and difficulty in breathing as newborn danger signs. Older mothers, multipara and those who had tertiary education were likely to know more than one danger sign. Overall 7.9% of neonates in the post natal wards were found to be unwell

Conclusion

Mothers should be educated on newborn danger signs with emphasis placed on younger mothers, and the primiparae

Introduction and Background

It is estimated that 4 million neonatal deaths occur worldwide each year. 99% of these deaths occur in developing countries.[1] The overall under 5 mortality has been reducing in the last decade due to successful child survival interventions. This reduction has been in the post neonatal period. There has been very little change in neonatal mortality. Deaths in the neonatal period have been largely unaddressed as a global health concern and account for 41% of all deaths of children under 5. [1, 2] Despite current increased efforts, much more needs to be accomplished to reduce neonatal mortality rates from levels as high as 40-60 per 1000 live births and to achieve millennium development goal 4.[2]

In sub-Saharan Africa, 1,208,000 babies die before their first month of life.[3] This accounts for ¼ of child deaths in this region.[4] Three main conditions account for newborn deaths. These include infections, birth asphyxia and prematurity. These account for 88% of newborn deaths. Infections including sepsis/pneumonia, tetanus and diarrhoea account for 36% of neonatal deaths in sub-Saharan Africa.[5]

There are many factors that influence newborn health and the resultant mortality. These include immediate causes such as lack of antenatal care, unsupervised or poorly supervised home deliveries, unhygienic and unsafe delivery practices and cord care, prematurity, low birth weight, lack of exclusive breastfeeding and delays in recognition of danger signs in both mother and baby.[1] Health system ineffiencies, infrastructural, logistic and economic constraints also contribute to high rates of neonatal mortality.[1,5] Wide inequities exist in health service provision such that the lowest coverage rates of known effective maternal and child interventions exist within the poorer income groups.[6]

It is recognized that up to 70% of newborn deaths can be prevented by scaling up evidence based available interventions such as giving tetanus toxoid to mothers, clean and skilled care at delivery, newborn resuscitation, exclusive breastfeeding, clean umbilical cord care and early management of infections in newborns.[7]

Besides mortality, neonatal conditions such as prematurity and low birth weight have implications from complicating conditions such as pulmonary disease and affect quality of life. Conditions affecting neonates also result in retarded growth and disability through neurological and cognitive impairment.[8]

Millennium development Goals

The millennium summit in the year 2000 aimed at reduction of world poverty and increase in the rate of development. Eight millennium development goals were agreed upon. Millennium development goal 4, 5 and 6 are health related. Millennium development goal 4 aims at reduction of child mortality by 2/3 by the year 2015. Three indicators for this include under 5 mortality rate, infant mortality rate and proportion of 1yr old children immunized against measles. With only 3 years to the year 2015, child mortality remains a major problem.[9]

Significant progress has been made in reducing under 5 mortality as well as infant mortality. However, deaths among newborn infants less than 28 days of life have remained a challenge. Of the 8.2 million under 5 child deaths occurring each year, about 3.3 million occur during the neonatal period. 3 million of these die within 1 week and almost 2 million on their first day of life. Thus, 41% of under 5 child deaths are in the newborn period. ¾ of all newborn deaths occur in the first week of life. A child's risk of dying in the first 4 weeks is 15 times greater than any other time before the first birthday.

Kenyan situation.

Kenya has committed itself to Millennium Development Goals. According to the Kenya demographic health survey there has been significant decrease in child mortality in the last 10 years. In the 1999-2003 KDHS, under 5 mortality was 115 per 1000 live births while infant mortality was 77 per 1000 live births. Neonatal mortality during this period was 35 per 1000 live births.[10] In the 2003-2008 KDHS, under 5 mortality declined to 74 per 1000 live births, while infant mortality declined to 52 per 1000 live births. However there was only a minimal decline in neonatal mortality which was 31 per 1000 live births. Thus 60% of infant deaths occur in the first month of life.[11]

Early recognition of neonatal danger signs has been linked to improved neonatal outcomes, and a decrease in mortality.[12] The mother child booklet given to mothers during antennal clinics has information on danger signs of neonatal illness. Five danger signs have been

included. These are, inability to breastfeed, difficult or fast breathing, and baby becomes hot or cold or baby becomes yellow.[13] It's expected that mothers will be informed about them in the health education sessions during antenatal visits and before discharge home after delivery. The percentage of mothers attending ante-natal clinic has increased. 92% of pregnant women were shown to have attended antenatal clinic in the recent KDHS.[11]

Local uptake of the postnatal visit is very low. Once allowed home the babies are seen at 6 weeks during immunization. Therefore little is known about what happens once babies have been allowed home. In a local unpublished study in which mother baby pairs were followed up after discharge with emphasis on exclusive breastfeeding, 17% of babies delivered in hospital had died by 10 weeks of age.[14]

Literature review

Several studies have been conducted to assess mother's knowledge of signs of neonatal illness. Most of them have been conducted in south East Asia.

In rural Bangladesh, Choiy et al conducted a randomized controlled trial comparing maternal report on neonatal illness and assessment by community health workers. Surveillance in the intervention arm of two cluster randomized control trials of newborn interventions was conducted in two districts of Bangladesh. Community health workers promoted birth and newborn care preparedness during two prenatal visits including recognition of neonatal illness. Community health workers identified neonates with very severe disease using clinical algorithms that included ascertainment of illness history reported by the mother and observation of clinical signs of illness. Sensitivity, specificity and positive predictive value and negative predictive value of maternal report of any illness sign compared to community health worker's assessment and classification of very severe disease were calculated. Results showed that maternal reports of any signs had sensitivity of 24% and 20% and positive predictive value of 45% and 54% in Sylhet and Mirzapur districts respectively. This indicated that maternal recognition of neonatal illness at home was poor in these two rural areas of Bangladesh.[15]

In India, Dongrel *et al* conducted a study to asses mother's knowledge and explore their perceptions about newborn danger signs and health care seeking behavior. They conducted a cross-sectional survey in 3 of the 27 primary health centers of wardha district. About 67.2% of mothers knew at least one danger sign. Majority of mothers (87.4%) responded that the sick newborn should be immediately taken to the doctor, but only41.8% of such sick newborns got treatment. The study found a gap between mother's knowledge and their health seeking behavior for seek newborns.[16]

In a study to find out awareness of mothers about newborn danger signs and their health care seeking behavior for sick newborns in a periurban field practice in India, Dongre *et al* undertook a triangulated study of quantitative and qualitative methods. 72 identified mothers of children 0-11 months were interviewed. Out of these, 29 (40.3%), 16 (22.2%), and 10 (13.9%) identified difficulty in breathing, poor sucking and lethargy/unconsciousness as newborn danger signs respectively. Only 7 (9.7%) and 2 (2.8%) identified convulsion and hypothermia as newborn

danger signs respectively. Findings from the study indicated that there was poor awareness of mothers regarding newborn danger signs. There was need for raising awareness which was required for early recognition and prompt treatment.[17]

Senarath *et al* conducted a cross-sectional study to assess mother's knowledge on newborn care as well as factors associated with poor knowledge. They sampled 446 mother-newborn pairs from 5 hospitals in the Puttalam of Srilanka by stratified random sampling. Except for a few conditions, mothers demonstrated a satisfactory knowledge in recognizing danger signs of the newborn. According to multivariate analysis, primiparae (odds ratio OR=2.31, 95% CI 1.53-3.50) and unemployed women (OR =2.02, 95% CI 1.26-2.23) were more likely to have poor knowledge.[18]

Shally Awashi *et al* carried out a study in Northern India to find out perceptions of care givers and health workers regarding danger signs of neonatal illness. More than half of the caregivers recognized fever, irritability, weakness, abdominal distension/vomiting, slow breathing and diarrhoea as danger signs in neonates.[19]

A study conducted in Eastern Uganda with an objective of investigating causes of and contributors to newborn deaths used the three delays audit approach. Major contributing delays to newborn deaths were caretaker delay in problem recognition or in deciding to seek care for the sick newborns.[20]

Study justification

An average of 900 mothers deliver in Kenyatta National Hospital's maternity unit per month. Some of the mothers have been on ANC follow up at the hospital, while others have had it elsewhere and come to KNH for delivery. It also receives referrals. A study by Kihara *et al*, established that 17% o babies delivered at KNH had died by ten weeks of age. However, the causes of the deaths were not known. This was a large number of deaths occurring after the babies had been discharged while well.

This study intends to establish the knowledge of mothers concerning signs of neonatal illness. It will also establish attitudes and practices regarding neonatal illness among mothers who deliver at Kenyatta National Hospital. Babies will also be assessed to evaluate their clinical health. Findings from this study will inform decision regarding review of neonates in the postnatal wards before allowing them home, as well as actively teaching mothers to identify signs of neonatal illness. It will also form a basis for formulation of larger community based studies, where 56% of deliveries occur.[11]

Study questions

1. What is mother's knowledge, attitude and practice in regard to recognition of neonatal illness?

2. How well were neonates delivered in Kenyatta National Hospital at the time of discharge home?

Objectives of the study.

Broad objective

To determine the knowledge, attitudes and practices towards recognition of signs of neonatal illness among mothers delivering at KNH.

Specific objectives.

1. To assess mother's knowledge of signs of neonatal illness.
2. To asses the attitudes regarding neonatal illness.
3. To asses the practices regarding neonatal illness.
4. To asses how well neonates were in KNH post-natal wards.

Methodology

Study design:

The study was a hospital based cross-sectional survey. Both qualitative and quantitative methods were used.

Study site: The study was conducted in KNH's post natal wards. This is a government hospital that serves the population of Nairobi and also receives referrals. It's also the teaching hospital for the University of Nairobi.

Study period: The study was conducted between January and March 2013.

Study population: Mother baby pairs in KNH's post natal wards.

Sample size calculation

Sample size was calculated based on the formula;

$n = z^2pq/d^2$

Where:

n – The desired sample size

z – The standard normal deviate at the required confidence interval (1.96)

p – The proportion in the target population estimated to have characteristics being measured. (50%) since there is no estimate available of the target population in our setting 50% will be used as recommended by Fisher et al.

q – 1-p

d- The level of statistical significance set.

Therefore,

$$N = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$

N = 384

Sampling procedure

Convenient sampling method was used to select mother-baby pairs for the questionnaire interviews. Based on the eligibility criteria, mother-baby pairs were consecutively enrolled into the study until the required sample size was achieved. In addition, mothers to be included in the focus group discussions (FGDs) were selected purposively.

Inclusion criteria:

Mothers and neonates in KNH postnatal wards.

Informed consent was sought from the mothers.

Exclusion criteria:

Mothers who refused to consent to the study.

Babies who had congenital malformations. These might have been identified as unwell due to the existing malformations.

Babies admitted in the newborn unit.

Data collection procedures

The researcher approached the eligible participants and administered informed consent form. The form had all the information about the procedures of the study. The information included the title of the study, and its purpose, risks and benefits of the study. Mothers were also informed that failure to participate in the study would not compromise their care as well as that of the babies. Subsequently, mothers were asked to sign an informed consent form and those who consented were enrolled into the study. A structured questionnaire was used to record information during interviews. The focus of the quantitative arm of the study was to collect data on the socio-demographic characteristics and antenatal history from the mothers. Also, history concerning the babies was taken. Clinical examination was conducted on the babies. In addition, knowledge on danger signs of neonatal illness was recorded in the questionnaires.

Focus group discussions (FGDs)

FGDs were conducted to explore attitudes and practice of mothers in regard to neonatal illness. A total of six focus group discussions were conducted with each group comprising of 8 members. A discussion guide was prepared, consisting of specific questions that were used to gather as much information as possible. The principal investigator was the moderator, and was

accompanied by an assistant who was the note taker. Participants were recruited from the post natal wards using purposeful sampling. Sitting arrangement was in a circular manner to allow all participants to see each other. The moderator introduced herself as well as the note taker, and then each participant was allowed to introduce themselves. After the introduction, the discussion began. All participants were encouraged to air their views and were treated equally. Each discussion lasted about 45 minutes, and stopped at the point of saturation.

Data management and analysis

Quantitative data was entered, cleaned and analyzed using SPSS version 17.0. Descriptive characteristics of the population using socio-demographic factors and ANC history was analyzed and presented as proportions and means for categorical and continuous data respectively. Knowledge on danger signs for neonatal illness was presented as proportions and the mothers were categorized into those knowing more than 1 danger signs versus those knowing a single danger sign. Factors such age, parity, education level and number ANC visits were associated with knowledge on danger signs. Mean age was compared using Student's t test while associations with categorical variables was done using Chi square test. All the statistical tests were performed at 5% level of significance.

FDGs data was analyzed qualitatively. The notes and the transcribed tape recorded audio data were compiled and coded. The coded data were organized into themes and the information presented as narratives. Where necessary, FDG members information was presented verbatim in the results.

Ethical considerations:

Ethical approval was sought from the KNH/UON scientific and ethical review committee. Mothers were given information on the study and consent was sought. After the interviews mothers were given feedback. Where knowledge and practices were poor, correct information was given. Reinforcement was done for those with the correct information. Any babies identified as unwell were treated.

RESULTS

Social demographic characteristics

A total of 384 mothers admitted at Kenyatta national hospital postnatal wards were interviewed between the January 2013 to March 2013. Data on selected social-demographic characteristics is presented in Table 1.

Table 1: Selected social demographic characteristics.

Variable	**Frequency (%)**
Age of the mother (yrs)	
15-20	29 (7.6)
21-30	279 (72.2)
31-40	71 (18.4)
>4	5 (1.3)
Parity	
Para 1	105 (27.3)
Multipara	279 (72.7)
Education	
None	2 (0.005)
Primary	42 (10.9)
Secondary	201 (52.3)
College	141 (36.7)

The mean age was 26.3 (15-47) years. Most of the mothers interviewed (72.7%) were multipara. Education level was good with 74% of the mothers having a post primary education. Only 2 mothers (0.005%) had not been to school.

Ante-natal characteristics

The antenatal factors considered included number of antenatal visits, gestation at first ANC visit and whether they had used the mother child booklet developed by the Ministry of Health or other form of record. The mother child booklet has information on danger signs of neonatal illness.

More than half of the mothers had had at least 4 or more antenatal visits (64%). Most mothers had started their antenatal clinic in the second trimester (62.2%).

59.3% of the mothers had been given the mother child booklet. 41.1% had either had a card, or files were used during their antenatal clinic attendance. These findings are presented in the table below.

Table 2: Ante-natal characteristics of the mothers.

Variable	**Frequency (%)**
ANC Number of visits	
None	2 (0.5)
1	29 (7.5)
2	43 (11.2)
3	64 (16.7)
4 or more	246 (64)
Gestation age at first ANC visit	
<3 months	76 (19.8)
4-6 months	237 (62.2)
>7 months	71 (18.4)
Months Child booklet used during ANC	
Yes	226 (59.3)
No	158 (41.1)

The study also determined whether mothers had received information regarding the newborns during antenatal visits for the current newborns. The responses are presented in table 3 below.

Table 3: Information regarding newborns received during ante-natal visits.

Variable	**Frequency %** **n =384**
Information on baby given during antenatal visit	
Yes	206 (53.6)
No	178 (46.4)

The study also determined whether mothers had received information regarding their newborns after delivery. These findings are presented in the table below.

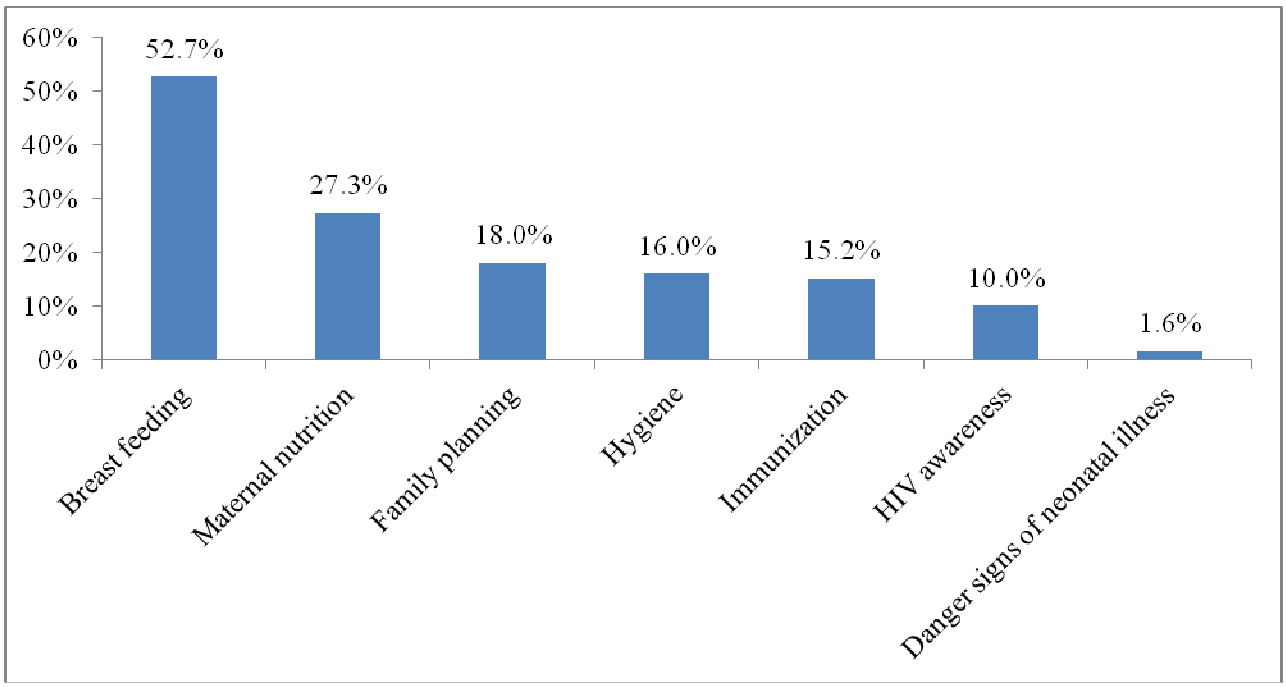
Table 4: Information regarding newborns received after delivery

Variable	**Frequency** **n=384**
Information on baby given after delivery in hospital	
Yes	261 (67.9)
No	123 (32)

Most of the mothers, 261 (67.9%) received information about the newborn after delivery in the hospital. Slightly above half of the mothers, 206 (53.6%) had received information regarding the newborns during ante-natal visits.

Most mothers reported to have been informed on breastfeeding technique and exclusive breastfeeding 52.7%. Only 1.6% had received information on neonatal danger signs. These findings are presented in the Figure 1 below.

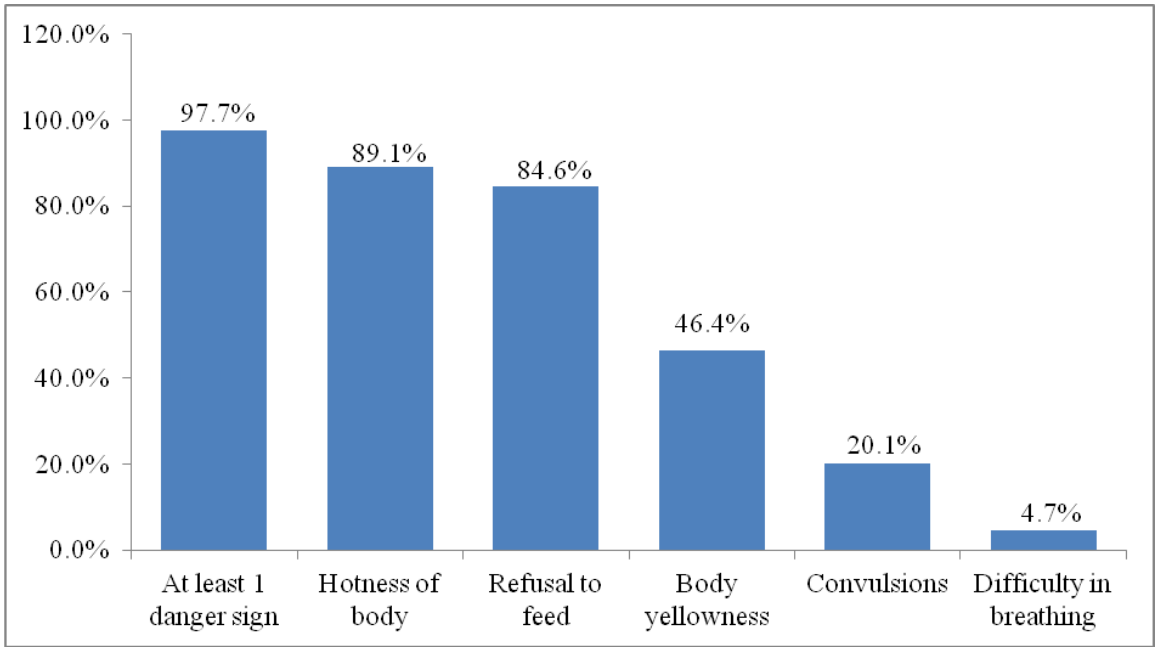
Figure 1: Type of information received.



Mothers knowledge on danger signs of neonatal illness

To assess knowledge of signs of neonatal illness, mothers were asked which signs of neonatal illness they knew. Findings are presented in the figure below.

Figure 2 : Knowledge of danger signs of neonatal illness.



Up to 97.7 % of the mothers knew at least one danger sign. Hotness of the body is what most mothers knew as a danger sign. In univariate analysis, the likelihood of mothers knowing more than one danger sign of neonatal illness increased with age of the mothers, higher parity (OR 13.5, 95%CI 7.1-25.7) and higher level of education (OR 3.6, 95%CI 1.8-7.4). On the logistic regression model, age (adjusted OR 1.2, 95% CI 1.1-1.4) , multi-parity (adjusted OR 2.8, 95% CI 1.03-7.4) and tertiary level of education (adjusted OR 2.9, 95% CI 1.3-6.8) were independent determinants of knowledge of signs of neonatal illness. These findings are presented in the table on the next page.

Table 5: Factors associated with knowledge on danger signs of neonatal illness

Variable	Danger signs		OR (95% CI)	P value	Adjusted OR (95% CI)	P value
	More than 1 (n=314)	1 sign (n=61)				
Age	27.3 (4.2)	22.2 (3.3)	-	<0.001	1.2 (1.1-1.4)	0.003
Parity						
Para 1	54 (17.2)	45 (73.8)	1.0		1.0	
Para 2 or more	260 (82.8)	16 (26.2)	13.5 (7.1-25.7)	<0.001	5.9 (2.5-14.1)	<0.001
Education level						
Primary/Secondary	184 (58.6)	51 (83.6)	1.0		1.0	
College/University	130 (41.4)	10 (16.4)	3.6 (1.8-7.4)	<0.001	2.9 (1.3-6.8)	0.013
ANC visits						
<= 3	101 (32.5)	27 (45.0)	1.0		1.0	
>=4	210 (67.5)	33 (55.0)	1.7 (1.0-3.0)	0.062	0.8 (0.4-1.5)	0.451

Results of the Focused group discussions

Further assessment of knowledge of signs of neonatal illness as well as attitude and practice was done in the focus group discussions. 6 focus groups discussions consisting of 8 members each were held.

The first question explored conditions that would affect the unborn baby if they occurred during pregnancy.

Among illness occurring during pregnancy that were thought to affect an unborn baby were malaria, sexually transmitted infections, bleeding during pregnancy and HIV. The effects of these illnesses were thought to be miscarriage, small baby, or baby could be born dead.

Table 6: Illnesses during pregnancy that will affect the unborn baby

Illnesses	**Effects**
Malaria, sexually transmitted infections, bleeding during pregnancy, vomiting, general body weakness, premature rapture of membranes, malnutrition, inability to feed, stress, serious headache, palpitations, fever, HIV, high blood pressure during pregnancy, diabetes **Other:** Poor diet, alcoholism, smoking cigarettes	• Miscarriage • Small baby • Baby can be born dead

Understanding of neonatal illness.

The mothers understood neonatal illness to be when "the baby has fever, not feeding well and generally looking sick".

Among the signs identified by the mothers that indicate neonatal illness included "fever, baby appearing tired or dull, a lot of crying, refusal to breastfeed, vomiting, diarrhea, loss of weight and failure to pass stool".

They said "tired or dull baby" and "refusal to breastfeed" are signs that suggest the baby is very sick.

According to the mothers, "*high fever, diarrhea and loss of weight*" required emergency consultation.

Causes and prevention of neonatal illness

The mothers thought the causes of illnesses in neonates were "*lack of hygiene''* causing diarrhea, ''*overdressing*'' leading to fever and ''*cough*'' as a result of cold". Among the prevention measures against neonatal illness include "*hygiene*" which refers to keeping baby's items separate from others, washing and wiping the breasts before breastfeeding, washing hands after visiting the toilet, keeping the environment clean and generally the mother should be clean. In addition, the mothers said "*the baby should sleep under a mosquito net, exclusively breastfed up to 6 months and should be exposed to the sun*".

Cultural beliefs regarding neonatal illness

Cultural beliefs regarding neonatal illness were explored. Due to the heterogeinity of mothers' cultural backgrounds, the responses were varied.

Some of the cultural beliefs the mothers stated were as follows:

In case of illness among the neonates certain remedies are undertaken for instance "*a paper is placed on the forehead of baby who has heartburn*". If a baby cries too much, "*a name is given to prevent the baby from falling sick"* or in other cases a baby is "*named after the grandmother for the baby to remain healthy*". Similarly, another culture believes that there is bird called "*nyuni*" that cause a lot of crying in neonates and can be treated seeking healing from a witch doctor. It was also indicated that in some cultures diarrhea can be prevented by "*making marks at the corners of the mouth using a sharp object*".

In relation to sickness and death of neonates, the women explained them by stating some of the cultural beliefs and practices. A husband engagement in extra-marital affairs was said to be risky to the neonates since "*if he comes and holds the baby, especially a boy, the baby will die*". Also, certain cultures demand that a baby who accompanies the parent to a funeral have to be made" *to stand on the coffin or grave site to avoid falling sick and death*". Sickness and death are associated to "*bad eye*" and "*plastic teeth*" in some cultures. A both cases a witch doctor will help in healing of the baby.

Some women in the discussions said that in some cultures the "*first hair*" for the baby is shaved to signify that "*the baby belongs to that home*" and "*the baby will fall sick and die if he/she was*

born out of wedlock". In other cultures, illnesses associated with witchcraft can be avoided by "*placing an ornament around the baby's waist once born*" or by using "*traditional medicine on the umbilical cord*".

According to the mothers, these beliefs and practices are "*protective*" and can prevent "*infidelity*".

Practices regarding neonatal illness

Cultural remedies to illness

Certain practices stated by the mothers used as remedies to neonatal illnesses include taking the baby to "*the person*" in case of a "*bad eye*" which will make the baby recover and get well. Also, umbilical cord "*falls and heals faster"* when " *mother's saliva is applied on it*". Majority of the women in the groups agreed that traditional medicines play a role in treating sick neonates.

Remedies before getting the baby to hospital

Some of the remedies practiced by the mothers before taking their babies to hospital include "*buying medicine from the chemists and giving the baby. Giving clean water in case of diarrhea*". In cases of fever, the women said they "*give a bath to their babies while others sponge the babies with a wet clothe or undressing of the baby*".

Prevention of neonatal illnesses

Mothers gave a list of the measures that can be undertaken to prevent neonatal illnesses and they were as follows:

- *Maintaining hygiene*
- *Ensuring babies are immunized.*
- *The mother should take a bath daily*
- *Hand washing*
- *Bathing the baby.*
- *Breastfeeding the baby exclusively for six months.*
- *Sleeping under the mosquito net.*
- *Well balanced diet.*
- *Giving the baby boiled water.*

ASSESMENT OF HOW WELL NEONATES WERE AT KNH.

RESULTS:

To find out how well neonates are, a total of 384 neonates were assessed. Mean duration of hospital stay was 2 days. Mean birth weight was 3.1 kg . History concerning the neonates was taken from the mother. The neonates were subsequently examined, which included a general examination, taking vital signs and examining of the systems.

Table 7: Age and weight of the babies.

Variable	**Frequency (%)**
Age of the baby in days	
Median (IQR) (days)	2 (1 - 4)
Range (days)	1 – 4
Birth Weight	
Mean (SD) (kg)	3.1 (0.5)
Min – Max (kg)	2.1 - 4.4

History and examination findings of the newborns:

Fever was found in 17 neonates representing 4.5% of the neonates assessed. Overall 7.9% of neonates in the post natal wards were found to be unwell. These findings are presented in the table 6 below.

Table 8: History and examination findings of the newborns.

Variable	**Frequency** **n=384**
Poor breastfeeding	10 (2.6)
Fever	17 (4.5)
Jaundice	3 (0.8)

DISCUSSION

This study was carried out to assess mother's knowledge of danger signs of neonatal illness, as well as attitude and practice towards neonatal illness. Where as this was a hospital based study, the study population compares to that of a study done in India by Dongre *et al*, where mean age of the study population was 24.7 (3.3)[17].

This study has demonstrated that mothers had good knowledge of danger signs of neonatal illness. 97.7 % of mothers knew at least one newborn danger sign. These findings demonstrate better knowledge compared to the findings by Dongre et al, where 67.2% of mothers knew at least one danger sign[17].

Most mothers knew fever (89.1%) and refusal to breast feed (84.6%) as a danger sign. However fewer mothers knew convulsions (20.1%) and difficulty in breathing (3.1%) as danger. None of the mothers reported hypothermia (baby feels too cold) as a danger sign. Neonatal pneumonia is a major cause of neonatal morbidity and mortality. Mothers may bring sick neonates late if they are not able to recognize difficulty in breathing as a danger sign. Late presentation may explain the high mortality rates among neonates admitted with sepsis as was found by Simiyu D *et al* in a study on morbidity and mortality of neonates admitted to KNH. Mortality rate in that study was found to be 315/1000 of neonates admitted, 32% of this was due to neonatal pneumonia[21]. In his study Awasthi *et al* found out that more than half of the care givers recognized fever, irritability, weakness, abdominal distension/vomiting, slow breathing and diarrhoea as danger signs in neonates[19]. The major preventative measure for neonatal illness was reported to be maintaining hygiene. This was noted in all the groups.

In the FGDs, mothers reported that a sick new born should be taken to hospital. However a lot of cultural beliefs and practices exist on newborn care. These are likely to influence health seeking behaviour in regard to neonatal illness. Cultural beliefs and practices were found to influence health care seeking in India by Dongre *et a*l, where only 42% of newborns with danger signs got treatment from hospital[17]. The use of home remedies as suggested by some mothers can affect outcomes of sick newborns.

Another important finding was that very few mothers (2%) reported to have received information on neonatal danger signs either during antenatal visits or after delivery. While the

mother child health booklet has information on danger signs, there is need to incorporate this message in health education messages given to mothers during antenatal visits and after delivery. In his study in Lao, Weiner et al demonstrated significant increase in mothers understanding of newborn care, after they were educated antenataly on newborn danger signs[22]. Dongre et al also demonstrated improvement in mother's knowledge regarding newborn danger signs after pregnant women were given health education regarding newborn care and danger signs. Mothers who knew difficulty in breathing as a danger sign significantly improved from 11.6% to 83.5%. Mothers who knew at least 3 newborn danger signs improved from 16.1% to 67.6%[23].

In this cohort of mothers, 64% had at least 4 or more antenatal visits. This is more than the national average which was 47.1% in 2008 KDHS[11]. Well packaged educational messages on newborn danger signs offered during ANC will therefore reach more than half of the pregnant women. This can have a great impact on reduction of neonatal morbidity and mortality.

Out of 384 neonates studied, 30 (7.9%) were unwell. These are neonates who were normal at delivery but developed problems in the postnatal wards. Poor breastfeeding was the commonest sign identified. Fever was the found in 17 (4.5%) neonates, and jaundice in 3 (0.8%). This findings indicate that there is a significant number of neonates who are unwell in the post natal wards

Limitations of the study.

The extent to which knowledge, attitudes and practices influence health care seeking for newborn danger signs was not included in the study, since it was hospital based. There was also cultural heterogeinity among mothers, and therefore beliefs and practices could not be generalized.

Conclusion

Most mothers know at least one newborn danger sign. However, there is poor knowledge regarding difficulty in breathing and convulsions. There exists cultural attitudes and practices that can affect new born care and health care seeking for neonatal illness.

There are up to 8% neonates who are unwell in KNH post natal wards, and in need of medical attention.

Recommendation

- Mothers should be educated about newborn danger signs. This education should be given during antenatal visits as well as after delivery.
- Routine evaluation of neonates in the post-natal wards should be carried out.
- A larger community based study should be carried out to asses mothers knowledge of newborn danger signs as well as attitudes and practices regarding neonatal illness.

REFERENCES

1. Lawn J.E., Cousens S., Zupan J. Four million neonatal deaths: When? Where? Why? *The Lancet*. 2005; **365**: 891-900.
2. 1 Lawn J.E., Cousens S.N., Darmstadt G.L., et al. One year after The Lancet Neonatal Survival series, was the call for action heard? *The Lancet* 2006; **367**: 1541-1547.
3. Bryce J., Requejo J.H., editors(2010). Tracking progress in maternal, newborn and child survival: The 2010 Report. Newyork: *UNICEF*.
4. Rajarathan J.K., Marcus J.R., Flaxman A.D., Wang H., Levin Rector A., et al(2010). Neonatal, post neonatal, childhood and under 5 for 187 countries 1970-2010: A systematic analysis of progress towards Millennium Development Goal 4. *Lancet* doi: 10.1016/S0140-6736(10)60703-9.
5. Bryce J., Bosci-Pinto C., Shibuya et al. WHO estimates of the causes of death in children. *The Lancet.* 2005; **365**: 1147-1152.
6. Durrane T., Anita.K.M. Burden of Neonatal Infections in Developing countries. *Paediatric infectious disease journal* 2009; **28**: S3-S9.
7. Lassi Z.S., Haider B.H., Bhutta Z.A. Community based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes.(Review). *The Cochrane Library 2010*. Issue **11**
8. Adnan A. Hyder., Salman A. Wali., Jeffrey McGuckin. The burden of disease from neonatal mortality: A review of south East Asia and sub-Saharan Africa. *BJOG: An international journal of obstetrics and gynecology* 2003;**110**: 894-901
9. The millennium development goals report, 2010. United Nations.
10. Kenya Demographic and Health Survey 2003. Kenya National Bureau of Statistics.
11. Kenya National Bureau of Statistics and ICF Macro.2010. *Kenya Demographic and Health Survey 2008-09*. Calverton, Maryland. KNBS and ICF Macro.
12. Darmstadt G.L., Bhutta A.Z.,et al. Evidence-based, cost-effective interventions: How many newborn babies can we save? *The Lancet 2005*; **365**; 977-988.
13. Mother and Child Health booklet. Ministry of Health, Kenya.
14. Kihara R. Efficacy of phone based counselling in supporting primi-parous women to exclusively breastfeed.. Mmed dissertation, UON 2011.

15. Choi Y. et al. Can Mothers Recognise Neonatal Illness Correctly? Comparison of Maternal Report and Assesment by Community Health Workers in Rural Bangladesh. *Trop Med Int Health* 2010 ;**15**(6): 743-53
16. Dongre A. R et al. Perceptions and Health Care Seeking About Newborn Danger Signs Among Mothers in Rural Wardha. *Indian Journal of Paediatrics* 2008; **75**
17. Dongre A.R., Deshmukh P.R., Garg B.S. Awareness and health care seeking for newborn danger signs among mothers in peri-urban Wardha. *Indian Journal of Paediatrics 2009*; **76**(7): 691-693.
18. Senarath u., Fernado D. N., Vimpani G., Rodrigo I. Factors associated with maternal knowledge of newborn care among hospital delivered mothers in Sri-Lanka. *Transactions of The Royal Society of Tropical Medicine and Hygiene* 2007; **101**(8): 823-830
19. Awasthi S., Verma T., Agarwal M. Danger signs off neonatal illness: Perceptions of caregivers and health workers in northern India. *Bulletin of World Health Organisation* 2006; **84**(10): 819-826.
20. Waiswa P., Kallander K. et al. Using the three delays model to understand why newborn babies die in eastern Uganda. *Tropical Medicine and International Health* 2010; **15**(8): 964-972.
21. Simiyu D. E. Morbidity and mortality of neonates admitted in general paediatric wards at Kenyatta National Hospital. *East African Medical Journal* 2004; **80**(12): 611-616.
22. Weiner E. A. et al. Antenatal education for expectant mothers results in sustained improvement in knowledge of newborn care. *Journal of Perinatology 2011*; **31**:92-97.
23. Dongre A.R., Pradeep R., Bisha S.G. a community based approach to improve health care seeking for newborn danger signs in rural Wardha, India. *Indian Journal of Paediatrics 2009*; **76**(1):45-50.

Appendix I

Patient consent information

I Dr Ann Gathoni, a post-graduate student pursuing Mmed degree in Paediatrics at the University of Nairobi, wish to conduct a study entitled, "Mothers knowledge, attitude and practice in neonatal illness and assessment of neonates at KNH"

The purpose of the study is to asses what mothers know in regard to signs of newborn illness. I'll also asses the newborns for any signs of illness. The study will be conducted under the supervision of Prof Ruth Nduati, and Prof Fred Were. These are paediatric consultants and lecturers in the department of Paediatrics and Child Health at the University of Nairobi.

The information you'll provide will be used for academic purposes. There are no direct benefits for participating in the study, but the results will be available to KNH to guide planning and provision of maternal and neonatal care.

In common with other research studies, this study has undergone ethical review and considered the principle of ethical conduct of medical research. Before consenting to this study, you are required to understand the following general ethical principles:

- Participation in the study is voluntary.
- You may withdraw from the study at any point without any consequence to you or you baby.
- There are no risks associated with participating in the study. There'll not be monetary gains/benefits. However if your baby is found to be unwell you'll be advised and the baby will be treated appropriately. You'll be given information on how to take care of your baby, and what danger signs to watch out for.

The procedure will be as follows:

You'll provide information guided by a structured questionnaire which will be administered by the researcher. A physical examination will be conducted on your baby.

All information you provide will be handled with strict confidentiality.

You can contact me on phone number 0735 16 53 16, in case you have any questions.

My supervisors are also available to answer any question related to the study and can be contacted through the department of Paediatrics and Child Health, University of Nairobi, P.O Box 19679-00202 KNH. Telephone number 020-2718045.

You can also forward any concerns to the KNH/UON Ethics and Research committee on telephone number 020- 726300-9 or P.O box, 20723, Nairobi.

Appendix II

Informed consent Form

I the undersigned do confirm that I have been informed about the study entitled, ‘mothers knowledge, attitude and practice in regard to neonatal illness and assessment of neonates at KNH’, by Dr Ann Gathoni.

I understand that there are no risks associated with the study. There will be no compensation for participating in the study, either monetary or otherwise.

I have been given the opportunity to seek clarification and do hereby now consent for my/participation of my baby.

Parent’s signature_____ Date _____

Investigator’s signature _____ Date _____

APPENDIX III: KISWAHILI.

KUKUBALI KUHUSIKA KATIKA UTAFITI: MAELEZO KWA MHUSIKA

Mimi daktari Ann Gathoni ni mwanafunzi wa shahada ya juu, katika idara ya afya ya watoto ya Chuo Kikuu cha Nairobi. Ninafanya utafiti wa kuchunguza ujuzi wa kina mama kuhusu magonjwa ya watoto walio chini ya mwezi mmoja. Pia nitachunguza afya ya watoto waliozaliwa hospitali kuu ya Kenyatta ambao bado hawajaenda nyumbani.

Utafiti huu unafanywa chini ya usimamizi wa Profesa Ruth Nduati na Profesa Fred Were ambao ni madaktari wakuu na pia wakufunzi katika idara ya afya ya watoto, Chuo Kikuu cha Nairobi.

Matokeo ya utafiti huu itatumika kimasomo. Matokeo haya pia yatatolewa kwa hospitali kuu ya Kenyatta ili kuboresha jinsi ya kutoa huduma ya afya kwa watoto walio chini ya mwezi mmoja.

Utafiti huu umepitiswa na kamati ya kukagua utafiti wa kisayansi ya Chuo Kikuu cha Nairobi na Hospitali kuu ya Kenyatta.

Unafahamiswa yafuatayo:

-Kuhusika katika utafiti huu ni kwa kujitolea.

-unaweza acha kuhusika katika utafiti huu bila madhara yoyote kwako au kwa mototo wako. Kutohusika hakutaadhiri utoaji wa huduma ya afya kwako au kwa mototo wako.

Tutafuata mpangilio ufuatao:

-Utaulizwa maswali na watafiti, na majibu yataandikwa.

-Mototo wako atachunguzwa jinsi afya yake ilivyo.

Ukiwa na swali lolote unaweza ukanipigia simu katika nambari 0735 16 53 16.

Unaweza wafikia wasimamizi wangu kupitia idara ya afya ya watoto, Chuo Kikuu cha Nairobi, sanduku la posta 19676-00202 KNH. Nambari ya simu ni 020-2718045.

Unaweza pia ukawasiliana na kamati ya uchunguzi wa utafiti ya Hospitali Kuu ya Kenyatta na Chuo Kikuu cha Nairobi, sanduku la posta 20723-00202, Nairobi. Nambari ya simu 020-726300-9.

APPENDIX IV: CONSENT FORM (KISWAHILI)

KUKUBALI KUHUSIKA KATIKA UTAFITI.

Mimi niliyetia sahihi hapa chini nimeelezewa kuhusu utafiti unaofanywa na daktari Ann Gathoni. Utafiti huu unachunguza ujuzi wa kina mama kuhusu dalili za magonwa ya watoto walio chini ya umri wa mwezi mmoja. Afya ya watoto pia itachunguzwa. Hakuna madhara yatatokana na kuhusika katika utafiti huu. Hakutakuwa na malipo yoyote pia. Nimeelewa maelezo na ninakubali kuhusika kwangu na mototo wangu.

Sahihi ya mzazi ……. Tarehe …….

Sahihi ya mtafiti ……. Tarehe …….

Appendix V

Questionnaire

No _____ Date_____

Mother

1. Age: _____
2. a) 15-20yrs b) 21-25yrs c) 26-30yrs d) 31-35yrs
   e) 36-40yrs f) >41 yrs
3. Parity: a) para 1 b) multipara
4. Marital status: a) single b) married
5. Education level: a) primary school b) secondary school c)college
6. Economic activity: a) None b) Formal employment
   c) Self employed
6. Average monthly income:

ANC

1. Place where ANC was attended

a) Public health facility b) mission c) Private

2. Number of visits: a) none b) 1 c) 2 d) 3 e) 4 f) >4
3. Gestation age at first ANC visit a) < 3months b) 4-6 months
   c) > 7months.
4. Do you have your mother-child booklet?
   a) Yes b) No c) other

5.(i) Were you given any information regarding your expected baby:
   a) During your ante-natal visits? a) Yes b) No

(ii) If yes what were you told?

b) After delivering your baby? A) Yes b) No

(ii) If yes what were you told?

7. Which signs of neonatal illness do you know?
    a) hotness of body
    b) convulsion
    c) yellowness of the eyes and body
    d) refusal to breastfeed
    e) difficulty in breathing
    f) other

Baby

1. Age _____
2. Birth weight_____
3. History:
    a. Poor breastfeeding
    b. Excessive crying
    c. Fever
    d. Convulsions
    e. Jaundice
    f. Difficulty breathing
    g. Other
4. Examination:
    a. Vital signs: Temperature_____ respiratory rate_____
    b.

Pulse rate_____

    c. General
    Activity
    Hydration status
    Jaundice
    Pallor
    Edema

d. Respiratory:
e. Cardiovascular
f. Central nervous system

   Tone _____ reflexes _____ Anterior fontanelle

g. Abdomen
h. Genital urinary

5. Conclusion:
6. Recommendation.

Appendix Vi

FOCUS GROUP DISCUSSION GUIDE

Title: Mother's knowledge, attitude and practice regarding neonatal illness.

The purpose of the study is to conduct evaluative research to determine:

-mother's knowledge of signs of neonatal illness

-explore attitudes and practice associated with neonatal illness.

Before the discussion begins, the informed consent process will be conducted.

Introduction:

- Welcome participants and introduce myself.
- Explain the general purpose of the discussion and why the participants were chosen.
- Discuss the purpose and process of the focus group.
- Explain the purpose and presence of recording equipment.
- Outline general ground rules and discussion guidelines.
- Address the issue of confidentiality.
- Inform the group that information discussed is going to be analysed as a whole and that participants names will not be used in any analysis of the discussion.
- Read a protocol summary to the participants.

Welcome to this focus group discussion. My name is Dr Ann Gathoni. I'm a postgraduate medical student in Paediatrics and Child health at the University of Nairobi. The purpose of the study is to find out what mother's know regarding neonatal illness, and explore attitudes and behaviuor associated with it.

Neonatal illness is a major health problem in our country. I've asked you to participate because you are the primary care givers of neonates. Your participation in this activity is purely voluntary. All your views will be kept confidential. If we should come to any issues you do not want to discuss, let us know and we will go to the next one. You can discontinue your participation at any time. The information that we'll gather from this discussions is for academic purposes. This information will also be availed to KNH so as to improve on delivery of maternal and neonatal care.

Explanation of the process:

The moderator will explain the focus group discussion process:

In a focus group discussion,

-we learn from you.

-we are not trying to achieve consensus, we are gathering information.

The focus group discussion will last about an hour.

We'll have snacks. You are free to help yourself.

The restroom and exit will be identified.

Focus group discussion norms

The group will be asked to suggest ground rules. After brainstorming, the following will be included in the list.

1. We want you to do the talking. Everyone should participate. I may call on you if i have not heard from you in a while.

2. Information provided in the focus group should be kept confidential. We will be tape recording the group. We want to capture everything you have to say. We don't identify anybody by name in our reports. You will remain anonymous.

3. There are no right or wrong answers. Every person's experience and opinion are important. Speak up whether you agree or disagree. We want to hear a wide range of opinions.

4. Stay with the group and please don't have side conversations.

5. Turn off cell phones if possible. If you must answer leave quietly and take the shortest time possible.

Helping is my assistant. His name is ……..he'll be taking notes and be here to assist me if I need any help.

After these clarifications, the group will be asked for any questions. These will be addressed before starting the discussion.

Once the questions are answered, the tape recorder will be turned on, and the discussion will begin.

Lets begin, lets find out some more about each other by going around the table one at a time. Tell us your first name and where you live. I'll start.

Let get started.

The initial question:

Today we are here to talk about neonatal illness. What comes to mind when you think about neonatal illness?

- How it comes about
- Why it happens

What are some of the health conditions in a mother during pregnancy will result in a neonate with poor health?

Which conditions will tell you that a newborn is sick?

Which conditions require emergency consultation?

Which beliefs and practices impact on the newborn's health and how?

Cultural beliefs

Cultural practices

Mothers will be given enough time to think and answer the questions. Probes will be used to make sure that all issues are addressed. We'll move on when we start to hear repetitive information.

Once all the questions are addressed, the discussions will be summarized.

That concludes our focus group discussion. Thank you so much for coming and sharing with us your views and opinions. We have a short evaluation form that we'd like you to fill out if you have time. If you have additional information that you didn't get to say in the focus group, please feel free to write it on this evaluation form.

APPENDIX VII

FOCUS GROUP DISCUSSION: CONSENT FORM:

My name is Dr Ann Gathoni, a post graduate student in Paediatrics and Child Health.

I have requested you to participate in a focused group discussion. The purpose of this study is to find out what mothers know regarding neonatal illness and perceptions and practices that impact on neonatal illness. The information learned in the focus group is for academic purposes. It will also be available to KNH so as to improve maternal and neonatal care.

You can choose whether or not to participate in the focus group and stop at any time.

Although the focus group will be tape recorded, your responses will remain anonymous and no names will be mentioned in the report.

There is no right or wrong answer to the focus group questions. We want to hear many different viewpoints and would like to hear from everyone. We hope you can be honest even when your response is may not be in agreement with the rest of the group. In respect of each other we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

I understand this information and agree to participate fully under the conditions stated.

Signed ……

Date ……

APPENDIX VIII: KISWAHILI

KUKUBALI KUHUSIKA KATIKA UTAFITI

Umeombwa kuhusika katika utafiti unaochunguza ujuzi wa kina mama kuhusu dalili za magonjwa ya watoto walio chini ya mwaka mmoja. Utafiti huu utafanyika kwa njia ya majadiliano.

Umuhimu wa utafiti huu ni kujua kama akina mama wanaelewa dalili za magonjwa ya watoto walio chini ya umri wa mwezi mmoja.

Unaweza amua kuhusika au kutohusika bila adhari zozote.

Majadiliano yetu yatanakiliwa katika kanda. Jina lako halitatumika, hivyo basi hutajulikana wazi wazi.

Majibu yote ni sawa. Tungependa kusikia maoni tofauti tofauti na kwa hivyo tunatumai kila mmoja atatoa maoni yake. Tutaongea mtu mmoja baada ya mwingine. Maoni yatakayotolewa hapa tusiyazungumze na wenzetu kule nje, yawe ni ya siri.

Nimeelewa maelezo haya na nimekubali kuhusika.

Sahihi …….

Tarehe ……

REFERENCES

1 Lawn J.E., Cousens S., Zupan J. Four million neonatal deaths: When? Where? Why? *The Lancet*. 2005; **365**: 891-900.

2 Lawn J.E., Cousens S.N., Darmstadt G.L., et al. One year after The Lancet Neonatal Survival series, was the call for action heard? *The Lancet* 2006; **367**: 1541-1547.

3 Bryce J., Requejo J.H., editors(2010). Tracking progress in maternal, newborn and child survival: The 2010 Report. Newyork: *UNICEF*.

[4] Rajarathan J.K., Marcus J.R., Flaxman A.D., Wang H., Levin Rector A., et al(2010). Neonatal, post neonatal, childhood and under 5 for 187 countries 1970-2010: A systematic analysis of progress towards Millennium Development Goal 4. *Lancet* doi: 10.1016/S0140-6736(10)60703-9.

5 Bryce J., Bosci-Pinto C., Shibuya et al. WHO estimates of the causes of death in children. *The Lancet.* 2005; **365**: 1147-1152.

6. Durrane T., Anita.K.M. Burden of Neonatal Infections in Developing countries. *Paediatric infectious disease journal* 2009; **28**: S3-S9.

7. Lassi Z.S., Haider B.H., Bhutta Z.A. Community based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes.(Review). *The Cochrane Library 2010*. Issue **11**

8. Adnan A. Hyder., Salman A. Wali., Jeffrey McGuckin. The burden of disease from neonatal mortality: A review of south East Asia and sub-Saharan Africa. *BJOG: An international journal of obstetrics and gynecology* 2003;**110**: 894-901

9. The millennium development goals report, 2010. United Nations.

10. Kenya Demographic and Health Survey 2003. Kenya National Bureau of Statistics.

11.Kenya National Bureau of Statistics and ICF Macro.2010. *Kenya Demographic and Health Survey 2008-09*. Calverton, Maryland. KNBS and ICF Macro.

12. Darmstadt G.L., Bhutta A.Z.,et al. Evidence-based, cost-effective interventions: How many newborn babies can we save? *The Lancet 2005*; **365**; 977-988.

13. Mother and Child Health booklet. Ministry of Health, Kenya.

14. Kihara R. Efficacy of phone based counselling in supporting primi-parous women to exclusively breastfeed.. Mmed dissertation, UON 2011.

15. Choi Y. et al. Can Mothers Recognise Neonatal Illness Correctly? Comparison of Maternal Report and Assesment by Community Health Workers in Rural Bangladesh. *Trop Med Int Health* 2010 ;**15**(6): 743-53

16. Dongre A. R et al. Perceptions and Health Care Seeking About Newborn Danger Signs Among Mothers in Rural Wardha. *Indian Journal of Paediatrics* 2008; **75**

17. Dongre A.R., Deshmukh P.R., Garg B.S. Awareness and health care seeking for newborn danger signs among mothers in peri-urban Wardha. *Indian Journal of Paediatrics 2009*; **76**(7): 691-693.

18. Senarath u., Fernado D. N., Vimpani G., Rodrigo I. Factors associated with maternal knowledge of newborn care among hospital delivered mothers in Sri-Lanka. *Transactions of The Royal Society of Tropical Medicine and Hygiene* 2007; **101**(8): 823-830

19. Awasthi S., Verma T., Agarwal M. Danger signs off neonatal illness: Perceptions of caregivers and health workers in northern India. *Bulletin of World Health Organisation* 2006; **84**(10): 819-826.

20. Waiswa P., Kallander K. et al. Using the three delays model to understand why newborn babies die in eastern Uganda. *Tropical Medicine and International Health* 2010; **15**(8): 964-972.

21. Simiyu D. E. Morbidity and mortality of neonates admitted in general paediatric wards at Kenyatta National Hospital. *East African Medical Journal* 2004; **80**(12): 611-616.

22. Weiner E. A. et al. Antenatal education for expectant mothers results in sustained improvement in knowledge of newborn care. *Journal of Perinatology 2011*; **31**:92-97.

23. Dongre A.R., Pradeep R., Bisha S.G. a community based approach to improve health care seeking for newborn danger signs in rural Wardha, India. *Indian Journal of Paediatrics 2009*; **76**(1):45-50.