STRUCTURED PRE-DISCHARGE EDUCATION ON CARE OF NEONATES TO MOTHERS OF NEONATES DISCHARGED FROM THE KENYATTA NATIONAL HOSPITAL NEWBORN UNIT

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DECLARATION

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

Signature: _(signature)_ **Date:** August, 05 2023

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The Department of Paediatrics has shaped me and given me the opportunity to grow as a physician and an advocate for children.

This would not have been possible without the support of my loving husband, family and friends.

Through God, everything is possible.

ABBREVIATIONS

ANC   Antenatal Clinic

CPAP   Continuous Positive Airway Pressure

ERC   Ethics Review Committee

FCC   Family-Centered Care

HDU   High Dependency Unit

ICU   Intensive Care Unit

KDHS   Kenya Demographic Health Survey

KNH   Kenyatta National Hospital

MCEE   Maternal and Child Epidemiology Estimation group

NBU   Newborn Unit

NICU   Newborn Intensive Care Unit

PNC   Postnatal Care

UoN   University of Nairobi

WHO   World Health Organisation

OPERATIONAL DEFINITIONS

Checklist: A list of tasks to be executed in an orderly manner.

Discharge: Permission to leave the hospital after completion of inpatient treatment.

Health Education: Information given with the aim of encouraging behavior change, reduce preventable illness and promote health.

Post-neonatal Mortality: Number of deaths in persons aged >28 days and <364 days.

Newborn: A baby in the first month of life.

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ABSTRACT

Background

Maternal knowledge on evidence-based interventions in the New Born Unit is often not structured, leaving these children vulnerable to adverse outcomes upon discharge.

This study aimed to test the effectiveness of a health education checklist in improving maternal knowledge on evidence-based interventions in the care of neonates discharged from the New born Unit.

Methods

This was a quasi-experimental interventional study, where mothers were consecutively recruited and allocated to a control or an intervention group. Upon consent, knowledge on evidence-based interventions on the care of neonates was assessed at the point of discharge. Health Education was imparted through a checklist to the intervention group and a post-test carried out on both groups via phone call after 8 weeks.

Data was entered using an online data collection tool (KOBO Collect) and analyzed via SPSS. The difference in gained knowledge between the two groups was compared using Students T-test. Ethical approval was sought from the KNH/University of Nairobi (UoN) Research and Ethics Board.

Results

This study included 52 mother-baby dyads in each arm. The One – way ANCOVA test showed a statistically significant difference in mean scores between the trained and control groups (Mean Difference = 9.3, $p < 0.001$) with more knowledge gained by the trained than the control group in overall scores, cord cord care & hygiene, warmth and

danger signs. Maternal age and Level of Education were positively corelated with greater gain in knowledge post-intervention with P values of ($p= 0.05$) and ($p < 0.01$) respectively. 5 children overall were readmitted (4.8%).

Conclusion

A Structured Pre-discharge Checklist improves overall knowledge on care of neonates and in aspects of cord care, warmth and danger signs. Age and Education of mothers is positively correlated with greater gain in knowledge on care of neonates upon discharge.

CHAPTER 1

INTRODUCTION

Every child has the right to live their full lives. Children born in developing countries face numerous obstacles, resulting in their untimely death. Life expectancy in Kenya according to Kenya Demographic Health Survey (KDHS) 2014 report is at 58yrs. The greatest causes of death in children have been specified according to the age groups thus allowing focused strategies to prevent deaths in each category.

Infant Mortality rate in Kenya is 39/1000 live births and about one in every 26 Kenyan child dies before the age of 1 with Neonatal Mortality Rate at 22/1000. (1) Neonatal Mortality Rate has been noted to reduce at the slowest rate of all the childhood mortality rates, despite the increased interventions targeted at this age bracket. These interventions are tailored towards reducing preterm and intrapartum complications, sepsis, pneumonia, and other conditions, which are the major causes of neonatal deaths as reported by WHO and MCEE (Maternal and Child Epidemiology Estimation group)
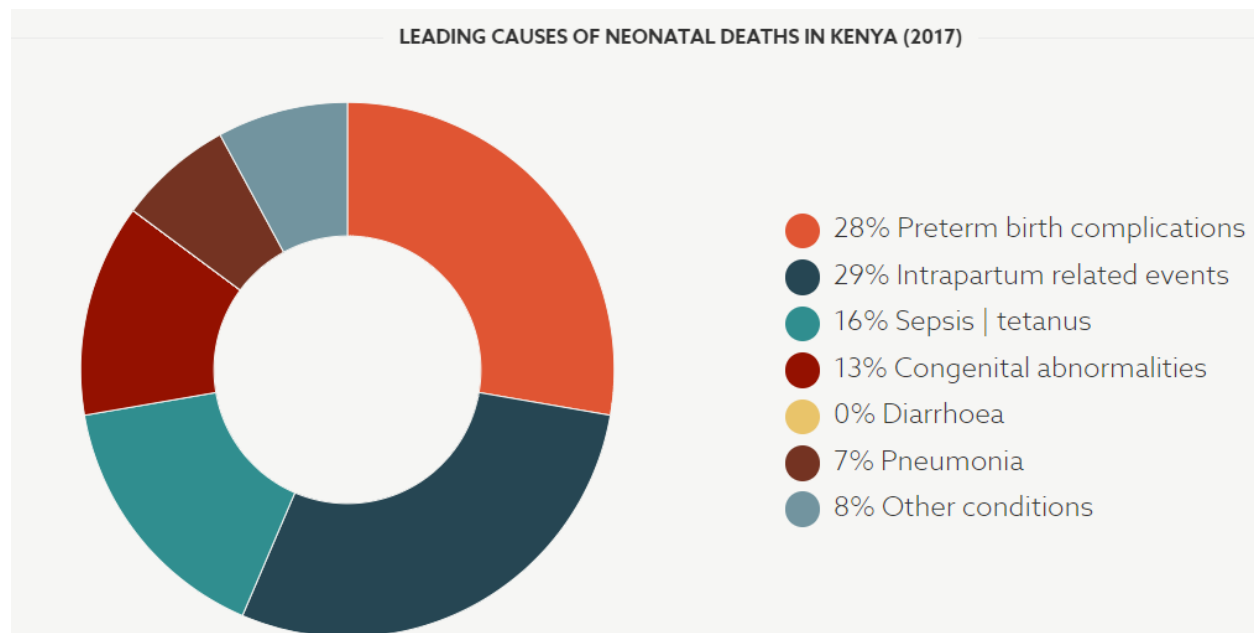

LEADING CAUSES OF NEONATAL DEATHS IN KENYA (2017)

- 28% Preterm birth complications
- 29% Intrapartum related events
- 16% Sepsis | tetanus
- 13% Congenital abnormalities
- 0% Diarrhoea
- 7% Pneumonia
- 8% Other conditions

FIGURE 1 *Causes of Neonatal Mortality*

(Source: UNICEF. Levels and trends in Child Mortality. UNICEF; 2017. (2)*)*

Such efforts include increasing access for mothers and children to healthcare facilities for the purposes of antenatal, perinatal, and postnatal care, with increased coverage of neonatal emergency care services and integration of a postpartum care package as a low-cost and high-yield action to reduce neonatal mortality. Most of the efforts to increase maternal knowledge on the care of their infants have been targeted at mothers of healthy, term neonates with short admission stays within the hospital. (10, 12) This neglects the mothers' experience of babies with a history of prolonged hospital stay who have been admitted for the care of early new-born illnesses.

Patients admitted to the Newborn unit require skilled staff including nurses, medical officers, and paediatricians. Specialized services may include nutritional consultation and occupational therapy, as well as the input of other specialties like ophthalmology and surgery, depending on the particular diagnosis. Mothers of such patients visit the Newborn Units regularly for feeding and nutrition, however, the unit at the National Referral Hospital does not involve all mothers in a structured education program in preparation for the safe discharge and handover of care to the family upon discharge of the patient home. Mothers of Preterm and Low Birthweight babies are educated on the basics of Kangaroo Care at the Unit.

According to M English et al(3) in a study conducted in Kilifi in 2001 on the follow-up of the patients discharged from the hospital, 5% of those aged less than 2 months of age died. This increased the overall mortality of the neonates admitted to the hospital who eventually died. This study also highlighted that infants found to have died at home had been admitted with severe infection, congenital defects, and prematurity. Within the National Referral Hospital, a study investigating the readmission and mortality of infants found that the most common diagnoses at readmission were sepsis and

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hyperbilirubinemia in both late preterm and term neonates, with acute renal injury as an added reason for readmission in late preterm(4).

Strategies to reduce readmission have included increasing the number of Antenatal Clinic (ANC) visits during pregnancy, intensifying coverage of skilled delivery, emergency obstetric and neonatal care, and a postnatal care protocol that involves education of parents before discharge. This targets the high number of neonatal deaths that occur between the first 24hrs and the first week of life, where most neonatal deaths occur. These services mostly target babies discharged from the wards soon after delivery, however, the structured parental education on how to care for the baby at home for patients admitted to and discharged from the Newborn Units has been neglected. (5)

Health Education of the mother has been shown to have desirable health outcomes in both the mother and the baby. Such favourable outcomes include increasing breastfeeding rates. This includes both the initiation of and continuation of breastfeeding practices, as well as reducing the number of babies born preterm and low birth weight. (6) In a review of the methods used to provide health education to women by Herval et al as referenced in this paragraph, it was concluded that the educational interventions that continued past the postpartum period were the most effective at improving maternal and child health.

Education of the mother helps to prevent delay in access to healthcare(7) A Three delay model characterised in studies in Uganda (8) and Ghana (7) found that delay occurs in recognition of danger signs and deciding when to seek care, access to the place of care and in receiving advanced care. This delay can also be understood as delay in the time it takes to seek medical care, the time it takes to reach the right diagnosis and delay in initiating the appropriate treatment for a medical condition. Dwivedi et al, in a study on the delay in initiation of treatment describes these as primary, secondary and tertiary delay in treatment. (9) Primary delay is reliant on the patient's characteristics such as their level of education, ability to recognise danger signs and seek medical care and their socioeconomic status. Secondary and Tertiary delays are healthcare and health-

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systems related, whereby factors involved include distance from the primary health facility to referral centres, availability of adequately trained medical personnel and availability of medical supplies. Primary delay, by preventing initial access to medical assistance, leaves patients vulnerable to the aspects of secondary and tertiary delay, increasing the chances of debilitating complications and mortality. This work aims to reduce primary delay, by increasing knowledge of evidence-based interventions on the care of new-borns at home and sharpening the ability of mothers to correctly identify danger signs, so as to reduce post-neonatal morbidity and mortality after discharge from the New-born unit.

According to the National Guidelines on Essential New-born Care, adapted from the WHO Guidelines on Essential New-born Care(10) medical personnel are to assess the baby prior to discharge and to educate the mother on care of the baby at home, how to tell if the baby is unwell, to alert them on follow-up visits and when to return immediately. Furthermore, upon discharge, parents are to be educated on the importance of exclusive breastfeeding and keeping the baby warm.

CHAPTER 2

LITERATURE REVIEW

KNOWLEDGE AND ATTITUDE OF POSTNATAL MOTHERS ON CARE OF NEONATES

Upon being handed over the care of babies to the parents at the point of discharge from the hospital, parents need to carry out the daily care and treatment needed to ensure their children's health and wellbeing. This also requires that the parents return to the hospital promptly for timely care and intervention, should their babies' health decline.

In assessing the gaps in knowledge and practice of mothers on the care of their infants, Amolo et al. 2011(3) noted that the knowledge the mothers had was skewed towards breastfeeding, with the majority of the mothers conversant with the aspects of breastfeeding such as exclusive breastfeeding, breastfeeding on demand and the importance of colostrum (90%). However, few mothers could identify the BCG and Polio vaccines (17.8%), the modes of thermoregulation, and the correct method of cord care. There was a positive association between poor antenatal education and inconsistent knowledge such that mothers with few ANC visits or limited postnatal education in ANC clinics would especially benefit from pre-discharge education. Results were similar in a study conducted in Sudan by Meseka et al. in the Juba Teaching and Referral Hospital, where there was a deficiency in the knowledge on appropriate cord care, thermoregulation and immunization.(11)

Mothers of preterm and low birth weight infants admitted to the Kenyatta National Referral Hospital were also found to be deficient in certain important care practices such as knowledge on the disadvantageous effects of pre-lacteal feeds, as well as insufficient knowledge on methods of thermoregulation(12).

These local studies highlight the shortcomings of the current inpatient educational experience, which is inconsistent and varies largely from parent to parent.

POSTNATAL CARE

A Postnatal care protocol developed by WHO to reduce maternal and childhood mortality was updated in 2022. This protocol states, in part, that education on maternal and neonatal emergencies is vital and such education must be given to mothers prior to discharge. This education includes counseling of the mother on the importance of exclusive breastfeeding at each point of contact after birth. This is a strong recommendation based on research. Mothers are to be notified of the importance of a clean and dry cord for babies born within the hospital and the use of 7.1% chlorhexidine daily for those born at home. Other aspects of postnatal care directed towards children include information on appropriate clothing for warmth which includes one extra layer of clothing than adults' one and the use of hats or caps. Parents should be encouraged to communicate and interact with their infants and promotion of immunization as per the national guidelines should also be carried out. Mothers are expected to know the danger signs necessary to seek hospital consultation with emphasis put on hygiene, handwashing, and habits to reduce infection while at home. (5)

A practical guideline on postpartum care for mother and child developed by WHO in 1998 stipulates the timing when postnatal care should be delivered to mothers. It alludes to the rule of 6s which is the review of mother and child for the first 6 hours after birth followed by 6 days and 6 weeks after that. This emphasizes the importance of early initiation of maternal education such as the knowledge of danger signs, breastfeeding, thermal care, and cord care within the first 6 hours of life right from birth. This guideline also acknowledges that care of the infant may even be better at home and therefore stipulates the need to impart knowledge of the care of the neonate to the mother, parents and surrounding community before discharge. (13)

Mothers have needs for specific information as the findings of a descriptive study conducted in Moi Teaching and Referral Hospital aimed at identifying what mothers need to know from the moment of birth to the first 6 weeks of life (14). Fifteen women were interviewed via phone at 3 intermediate points from the first 48 hours to 6 weeks

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and mothers reported unmet health information needs. Mothers reported differing information received from different healthcare workers and inconsistent information, the need for information to be uniform, preferably in printed forms, such as in a booklet. This points towards the gap in printed postnatal care guidelines which usually focus on training of healthcare workers as opposed to clear printed information for the mother as well. Lack of checklists for healthcare workers towards what information to disseminate to mothers may also contribute to this discrepancy.

Some facilities in Nairobi County (40%) were found to lack the Postnatal Care (PNC) guidelines as was evident in a descriptive study carried out in 2014 to assess the postnatal education given to mothers before discharge in 18 health facilities within Nairobi County (15). Four hundred and twenty-two mothers and twenty five healthcare workers were interviewed in total, using structured questionnaires, and only 34% of the health workers post-training adhered to its dissemination. This was dependent on the different norms of the facility, the workload of the health workers, staff attitudes, and duration of hospital stay among others. Level 3 hospitals and mission hospitals were found to be better at PNC than others.

FAMILY-CENTERED CARE

This is an approach to healthcare where the family is approached as an active partner in the well-being of the child, involving sharing of medical information concerning the patient openly and freely with the parents as stakeholders(16). This is especially important in the management of children with special needs, as is also the case with the small and sick babies nursed and discharged from the Newborn Unit. Families or mothers can be viewed as passive members of the care team who are a source of nutrition while the baby is still in the hospital, whereas Family Centered Care (FCC) views the mother as part of the interdisciplinary team involved in the control of the patient's management. Health education of mothers within the wards should be done by including them in the

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ward-round discussions and addressing issues around the safe discharge of the patient home at the end of treatment.

Health education should be aimed towards the mother, father, and relevant other family members, such as grandparents as children, as part of the community. This should be imparted in the form of counseling, direct training or group meetings, electronic and printed materials amongst others and should be started at the point of admission as part of the preparation for the discharge plan of the patient, to reduce the chances of inadequate information on the care of the infant at home (17). This helps to increase the confidence of the family in readiness for going home, alleviating the stress of handing over the care of the baby from the specialized hospital care to parents.

It has been noted that maternal education is important in reducing maternal, child, and infant mortality (18) is the most important factor in lowering under 5 mortality. Through building confidence in parents in knowing what decisions to make that affect their infants' health and facilitating behavioral change, families develop a preventative pattern of habits that reduce illness from the major causes of neonatal and other childhood mortalities. This is the potentially large benefit of the low-cost intervention in developing countries as most deaths are preventable by keeping the baby warm, exclusive breastfeeding, infection control, and recognition of danger signs. These interventions are reinforced at home.

The participation of an enlightened and educated family has been recognized in Every Newborn action plan as the fourth strategy for reducing preventable deaths in the neonate (19). It recognizes that many newborns die away from the hospital and that health outcomes of both mother and baby are dependent on the decisions made within the home. Therefore, engaging families even at home is vital for reducing rates of mortality. From an inpatient perspective, World Health Organization (WHO) published standards for improving outcomes of small and sick infants within health facilities and a key strategy is ensuring effective and participatory communication with families throughout their course of care in the hospital (20).

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EFFECTS OF INTERVENTION ON IMPROVING MATERNAL KNOWLEDGE AND PRACTICE

A randomized controlled study was carried out in Kenyatta National hospital by E Njuguna et al to investigate the use of audiovisual aids in improving the knowledge of mothers of neonates admitted to the Newborn Unit(21). The study focused on the recognition of danger signs in their infants, through the use of an 8-minute video and the Mother-Child Booklet. The sample size of 153 mothers was divided into an intervention group and a control group, with the intervention group receiving information in the form of both the video and booklet and the control group from the booklet alone. At the end of the study, the intervention arm was found to recognize 5/10 of the danger signs which was an improvement from the 2/10 before intervention. At baseline, the intervention group had greater knowledge of one danger sign (skin pustules), while the control group had greater knowledge of cold temperature as a danger sign. This, however, was not statistically significant.

Audiovisual aids were found to be an acceptable form of education. An educational intervention carried out in Rwanda by Mukarubayiza et al used videos from the Global Health Media Project in a pre and post-test design on a group of 53 mothers at a District Hospital. This study was targeted at parents of preterm infants to investigate the effectiveness of these videos in improving the knowledge of these parents in the care of their infants. The findings indicated that there was an increase in the number of correct responses after the educational intervention, significant enough to recommend that this form of education should be used routinely (22). This study did not follow up the participants after the post-test and therefore conclusions on the retention span of this knowledge cannot be made.

The use of a checklist was found to be useful in increasing the chances of mothers being able to tell danger signs in a study carried out in Kiambu by McConell M. et al. (23) A checklist was administered after discharge at different points and found useful in increasing the health-seeking behavior of the families involved. This randomized control trial was, however, targeted at the postnatal stage and it was not found to be significant in imparting knowledge and practices to mothers. This brings to question the appropriate

timing of education and the importance of initiating education before discharge, particularly for neonates discharged from the Newborn Unit.

MATERNAL EDUCATION

General maternal education has a positive impact on children's nutritional and immunization status as evidenced by Abuya et al in 2014 in their paper which set out to investigate the effect of maternal primary education on the chances of stunting and immunization rates in their children in Kenya (24). The findings stated that children of mothers that have primary school education are twice as likely to be immunized and have a 94% less likelihood of being stunted. Odundo et al in 2012 studied the effect of using a checklist at the point of discharge, on the rates of re-hospitalization and mortality (25). This discharge checklist included giving mothers health information on how to care for their babies at home after being discharged from the Post-partum wards. The study found that there was improvement in knowledge on cord cleaning and identification of danger signs as well as a reduction in the rates of re-hospitalization post-intervention.

RETENTION OF KNOWLEDGE AND INCLUSION CRITERIA

The question of how long knowledge gained upon education can be retained in a group of students is currently undecided. In a study carried out in 2016 Iran by Badiei et al (26) on a group of nurses to determine the feasibility of e-learning in acquisition of skills, e-learning was found to significantly increase knowledge and that this knowledge was retained even at 10 weeks post-education. With WHO recommending the final postnatal review at 6 weeks postpartum period (5,27) it would be beneficial to review knowledge retention around this period of time. All mothers are to receive this health education despite baby's gestation at birth. However due to complications associated with extreme preterm babies, education to this cohort has unique details that reduce its generalizability.

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Country, Author and Year	Study Setting	Study Population	Key Findings
Kenya Njuguna 2018	Postnatal Wards in KNH	Mothers of Healthy, Term Neonates. n= 153	The intervention arm was found to recognize 5/10 of the danger signs which was an improvement from the 2/10 before intervention.
Kenya Odundo 2018	Postnatal Wards in KNH	Mothers of Term neonates born via SVD. n= 435	Hospitalization rates were 7.4% pre-intervention and 3.2% post intervention. Significant improvement in knowledge on cord cleaning and identification of danger signs
Rwanda Mukarubayiza 2017	District hospital NICU	parents with preterm infants n=53	Mean pre-test knowledge score was 54%, post-test score was 92%
Badiei M 2016	3 Hospitals in Iran	nurses from the endocrinology and internal medicine wards n=123	mean scores of knowledge were significantly higher in the e-learning group one week after the intervention, four weeks after the intervention and 10 weeks after
WHO recommendations on maternal and newborn care for a positive postnatal experience 2022			Guidelines provide a health education recommendations on preventative measures such as thermal regulation, appropriate nutrition and breastfeeding, immunization, danger signs and appropriate hygiene, among others

Figure 2 Summary of Literature Review

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CHAPTER 3

STUDY JUSTIFICATION AND UTILITY

Studies on Knowledge and Practice of Mothers of infants have shown skewed knowledge towards some aspects of Newborn care, with mothers predominantly recalling aspects of breastfeeding and less on aspects such as vaccination and thermal care. This puts the children at risk of not receiving the other helpful evidence-based interventions while at home, which can lead to increased morbidity, frequent readmissions, and neonatal mortality. This study aims to test the effectiveness of a checklist on improving the knowledge of mothers and increasing the utilization of evidence-based interventions in the care of their neonates following discharge from the Newborn unit.

This study may lead to the adoption of a standardized discharge checklist whose potential benefits include reduced admission and mortality in neonates discharged from the hospital. It will also add on to the current research on maternal knowledge of evidence-based interventions on the care of their newborn babies after discharge from the Newborn Unit.

This study will report the effects of the current discharge process on mothers' knowledge and uptake of evidence-based interventions on the care of their newborns following discharge from NBU. It will highlight any oversights occurring during discharge and provide information on possible strategies to address them.

Mothers with healthy babies benefit from pre-discharge education and mothers with sick babies who are admitted into NBU are often left out. This study aims to test out the effectiveness of this intervention on mothers of babies discharged from specialized hospital units.

The study location (KNH) serves the entire country, therefore this study center will provide information on knowledge and practice on the care of newborns on mothers from varied geographical and socio-economic backgrounds.

Further, because of the prospective arm, it will provide further information on the short-term outcomes of neonates discharged from the NBU

RESEARCH QUESTION

How does a Structured Pre-discharge Education program impact the knowledge of the mothers and uptake of evidence-based interventions on the care of their babies following discharge from the NBU of KNH?

STUDY OBJECTIVES

Primary objective

To determine if the use of a structured pre-discharge checklist for health education among mothers of babies discharged from the New-born Unit, Kenyatta National Hospital increases the knowledge of evidence-based care of neonates compared to the standard discharge procedure.

Secondary objectives

i)   To determine the sociodemographic factors associated with maternal knowledge on evidence-based care of neonates.

ii)   To determine if the use of structured pre-discharge education checklist reduces readmission rates of neonates discharged from NBU within the period of December 2021 to January 2022.

CHAPTER 4

RESEARCH METHODOLOGY

STUDY DESIGN

This was a quasi-experimental interventional study (a non-equivalent comparator cohort study) whereby two groups of mothers were recruited consecutively, to compare the effects of an educational intervention versus the conventional discharge process.(28)

STUDY POPULATION

Mothers of babies discharged from the KNH, NBU during the months of December 2021 to January 2022.

STUDY LOCATION

The study site was the New-born Unit at The Kenyatta National Referral Hospital (Level 6) which is a Hospital with a 1500 bed capacity and up to 1000 deliveries per month. It caters to mothers and babies across the country, both those referred and born at the facility. The New-born Unit has a capacity of 60 babies but often cares for 120-150 babies at any given time, with sub-units providing care to preterm babies with a birthweight of <1000gm to >2500gms and sick term babies. It has a Neonatal Intensive Care Unit (NICU) and High Dependency Unit (HDU) and a separate area dedicated to Kangaroo care. NICU has a capacity of 6 beds with specialized equipment such as ventilators, monitors, and Continuous Positive Airway Pressure (CPAP) machines while HDU can hold up to 20 babies. The low-birth-weight and preterm babies are nursed in incubators in separate rooms and can reach a capacity of around 60 babies. A nursery room with stable babies nearing discharge and awaiting surgery holds between 30-40 patients in full capacity. Kenyatta National Hospital is a referral hospital involved in the training of technical and specialized staff offering both subsidiary and specialized patient support. Medical and Nursing students in their undergraduate and postgraduate training participate in the day-to-day care of patients. This included the

new Fellowship Program with 2 Neonatology Fellows at the time of the study and doctors pursuing their Masters in Paediatrics, all under the University Of Nairobi Department Of Paediatrics and the service is headed by Neonatologists from that Department. According to a monthly mortality meeting in the year 2020, the unit admitted about 240-250 babies each month, with 238 babies discharged and a crude mortality rate of 20-24% per month. This is a notably lower number than usual as it coincided with the peak of Corona pandemic.

The standard of care upon discharge is filling of the discharge form with information on the child's date of birth, weight, diagnosis and management, immunisations issued, discharge medication and date of next visit. This form is issued to the mother upon discharge, with verbal clarification on care of the baby at home as per each patient's requirements.

SAMPLE SIZE CALCULATION

Unpaired t-Test:

$$n = \frac{\left(t_{n(m+1)-2,\ \alpha/2} + t_{n(m+1)-2,\ \beta}\right)^2}{d^2}$$

Source: Ahrens J, Dieter U. A convenient sampling method with bounded computating times for Poisson distributions. In The First International Conference on Statistical Computing 1987 (pp. 4-17) [29]

where d = delta/sd (The Standard deviation is set at 0.9 from an interventional study carried out in China to improve parents' knowledge on vaccination[30])

ɑ = alpha (0.05)

β = 1 − power (80%)

m is the number of control subjects-1

$t_{v,p}$ is a Student t quantile with v degrees of freedom and probability p.

n is rounded up to the closest integer

Analysis of Covariates (ANCOVA) was used to analyse differences of mean test scores for both groups before and after the 8-week interaction were computed and a change in knowledge between the intervention and control groups of 10% was considered significant.(31) (30)

This set the sample size at around 52 participants for each arm with an increment of about 10% for each arm to cater for loss to follow-up. The final sample size per arm was therefore 57.

SELECTION AND ENROLLMENT OF PARTICIPANTS

Inclusion Criteria

- ✓ Neonates born at > 28 weeks gestation
- ✓ Mothers of babies who were 1 month or older at discharge

Exclusion Criteria

- ✓ A mother who did not consent to the research.
- ✓ Mothers without reliable phone contact

STUDY PERIOD

This study was carried out during the months of December 2021 to January 2022

PATIENT RECRUITMENT PROCEDURE

A Quasi-experimental (non-equivalent cohort design) was used(28). Mothers were recruited consecutively at NBU in KNH. The study participants were allocated into a control and intervention/study group. Participating mothers were recruited at the NBU and were issued with consent forms and once consent was given, questionnaires were administered in the form of an interview to test the knowledge mothers had on evidence-based interventions on the care of their neonates at the point of discharge for both groups. Health Education in the form of an evidenced-based intervention checklist

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was given in English or Kiswahili to the intervention group alone. A post-test was then carried out to both groups via phone call at 8 weeks of age.

Below is a diagram which shows the recruitment procedure.

Mothers of neonates discharged from the Newborn Unit who fulfilled eligibility criteria were selected

Informed consent was obtained from mothers/caregivers

Mothers were interviewed upon discharge at the NBU in the style of a questionnaire to assess their baseline knowledge on care of neonates at home and consecutively allocated to either the intervention or control group

Mothers within the intervention arm were given Health Education on Care of the neonate using the Structured Pre-discharge Checklist, while the Mothers in the Control Arm were guided through the discharge form and had any inappropriate knowledge clarified in a question and answer session

Mothers were contacted 8 weeks after initial contact for a repeat questionnaire-guided interview to assess their gain in knowledge (26)

Data on Sociodemographic factors was collected as well as the following short-term outcomes of interest; exclusive breastfeeding, immunization and readmissions.

Figure 3 Recruitment Procedure

SCREENING AND ENROLMENT:

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┌─────────────────────────────────────────────┐
│ Mothers were recruited in succession, upon   │
│ screening for eligibility (n=124)            │
└─────────────────────────────────────────────┘
                   │                    ──────────►  ┌──────────────────────────┐
                   ▼                                  │ Denied Consent (n=7)     │
┌─────────────────────────────────────────────┐     └──────────────────────────┘
│ Code numbers were assigned and Questionnaires│
│ administered through Open Data Kit (ODK)     │
└─────────────────────────────────────────────┘
                   │                    ──────────►  ┌──────────────────────────┐
                   ▼                                  │ Questionnaire not        │
┌─────────────────────────────────────────────┐     │ adequately filled (n=1)  │
│ Odd numbers received the Intervention checklist    └──────────────────────────┘
│ while even numbers went through the          │
│ Conventional Discharge Process               │
└─────────────────────────────────────────────┘
          │                        │
          ▼                        ▼
┌────────────────────┐   ┌────────────────────┐
│ Intervention       │   │ Control (Untrained)│
│ (Trained) Group    │   │ Group              │
│ n=60               │   │ n=58               │
└────────────────────┘   └────────────────────┘
          │                        │
          ▼                        ▼
┌────────────────────┐   ┌────────────────────┐
│ Dropped out n=2    │   │ Dropped out n=0    │
│ Unreachable n=5    │   │ Unreachable n=5    │
│ Incomplete Entry n=1│  │ Incomplete Entry n=3│
│                    │   │                    │
│ TOTAL n=52         │   │ TOTAL n=52         │
└────────────────────┘   └────────────────────┘
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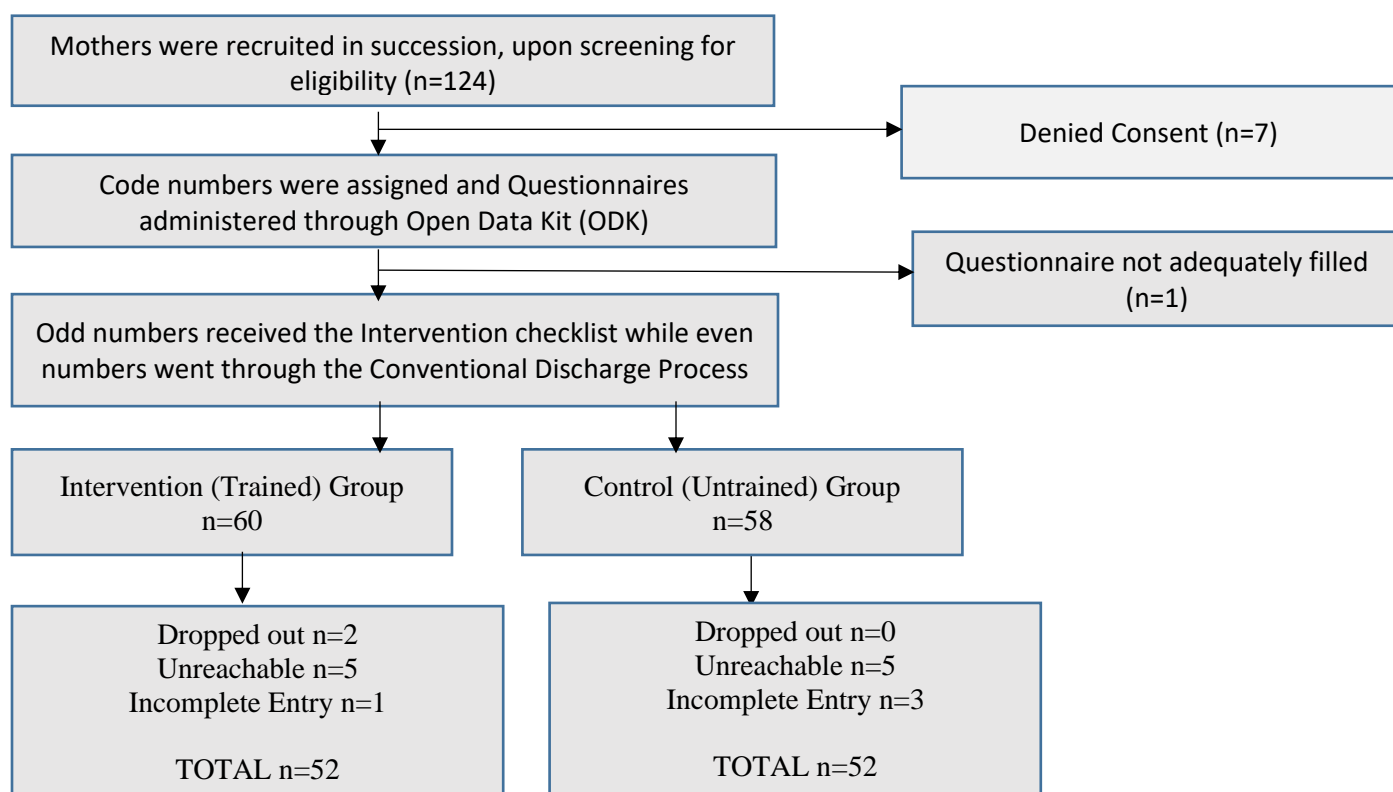*Figure 4 Screening and Enrolment*

<u>THE STUDY TOOL</u>:

The study tool was an electronic questionnaire delivered in an interview format by the trained research assistant. The responses were keyed in electronically and the database exported to Microsoft Excel for analysis. The questionnaire had three sections; on Socio-demographics, Health Education of mothers, and the final section investigated the potential outcomes of the study which includes checking the levels of compliance to vaccination and breastfeeding as well as readmission rates. The final section was only covered during the repeated interview at eight weeks, tailored specifically for collecting data on the outcomes mentioned above.

A Health Education Checklist educating mothers on the care of the discharged neonate was designed, emphasizing on 5 main checkpoints based on literature review around pre-discharge postnatal care recommendations. This checklist was used to provide education to mothers in the intervention group on the following 5 core items:

1. Cord care and hygiene

2. Temperature control of baby at home

3. Vaccines and Immunisation

4. Exclusive breastfeeding

5. Danger signs

The checklist also covered aspects of communication and feedback from mothers participating to ensure effective dissemination of information.

A questionnaire was used to assess the level of knowledge prior to intervention and after for both the control and intervention groups at 8 weeks.

DATA MANAGEMENT AND ANALYSIS

Data was collected using a questionnaire form which was administered to the consenting mothers by the study investigators. Data was entered, cleaned, and stored in a password-protected mobile application (KOBO Collect). The baseline information was saved under a participant study code attached to each mother, to protect the mother's identity. No name was documented and the phone numbers were restricted to the principal investigator and the research assistant. Data of persons who opted out of the study was discarded. The data published is entirely anonymous. Continuous variables were summarised using means and standard deviation or median with interquartile range. Categorical variables were summarised using proportions. The knowledge scores of each respondent was assessed and a score given out of 100%, 20% for each of the five core items to be evaluated. The mean score for the different groups was computed and the difference in mean scores, pre-and post-intervention was be compared to determine the significance of the evidence-based intervention. Scores were determined using the Student T-test to find the difference in means. The data was used to compare the uptake of immunization, breastfeeding rates and the rates of re-admission between the control and intervention groups.

ETHICAL CONSIDERATIONS

Ethical approval was sought from the KNH/UoN research and ethics board. Only consenting parents were enrolled in the study. Mothers below the age of 18 were considered as emancipated minors and consent was sought from them in the presence of their guardians, where present. The telephone numbers were kept confidential and used solely for the purpose of the follow-up at 8 weeks of age. Non-consenting parents were assured of continued best clinical care and non-discrimination. No financial implications were transferred to the patients. Participants were allowed to exit the study at any point and all information collected was kept confidential between the principal investigator and study assistants, with information stored using study codes assigned to the study participants. The intervention was non-invasive and posed no risks of harm to the participants. The study did not interfere with the management of the neonates while in the hospital and had little potential for harm or lack of safety. It benefitted the participants by providing education and improving the knowledge and practices of mothers in the care of their neonates for the participants in the intervention group. Inappropriate knowledge and knowledge gaps were clarified on the evidence-based interventions to execute at home upon filling of the questionnaire at the initial contact, irrespective of control or intervention group.

This process was entirely voluntary and all queries raised by mothers were addressed in a process free of coercion. Data of participants who withdrew from the study was discarded. Those interested in the findings of the research were noted and such information freely shared post-analysis.

Chapter 4

Results

Demographic Data.

Mothers

A total of 104 mothers were enrolled in the study. Both intervention and control groups had 52 (50.0%) mothers enrolled in each group. Only mothers in the intervention group were educated using the Structured Checklist while both groups were followed up after 8 weeks. The mothers' ages ranged between 14 – 49 years with a mean age ($M = 29.2$, $SD = 6.9$), multiple mode age of 29 years and a median age of 29.0 years. Majority of the mothers had Secondary level of education (51, 49.0%), were either married or co-habiting (85, 81.7%) and had more than four ANC visits (78, 75.0%) (Figure 2).
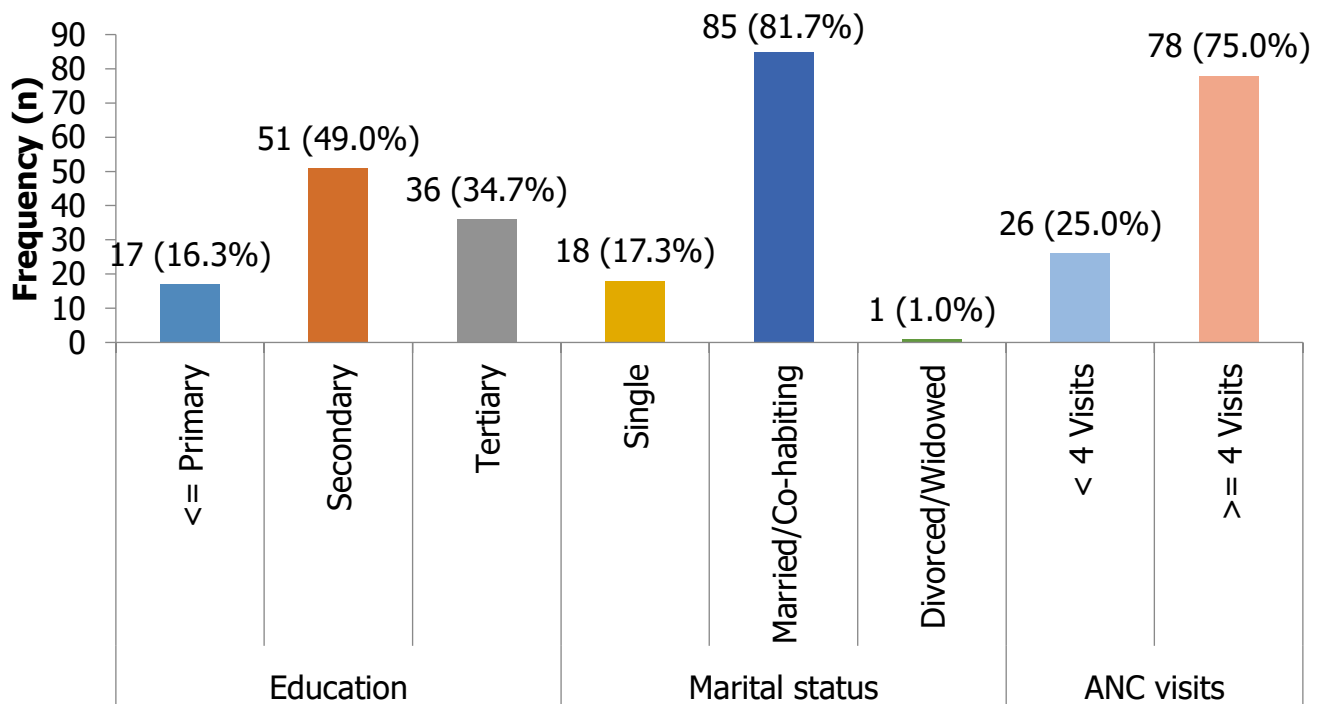

Figure 5 Mothers' Socio-demographic characteristics (n=104)

The demographics of both groups matched, but the intervention group was older by a mean difference of 1.9 years, a possible confounding factor as elaborated in the tables below.

Table 1 Comparison of Age and Days Admitted between Trained and Control groups

	Intervention	n (%)	M	SD	Levene's Test for Equality of Variances		Mean Difference	t	df	p
					F	p				
Age (years)	Intervention	52 (50)	30.2	7.0	0.365	.546	1.9	1.980*	102	.049
	Control	52 (50)	28.3	6.7						
Admission (days)	Intervention	52 (50)	8.9	8.1	0.716	.399	0.1	0.062	102	.950
	Control	52 (50)	8.9	7.6						

Table 2 Comparison of Education, Marital Status and ANC visits between Intervention and Control Groups

Characteristics		Total n (%)	Intervention Intervention n (%)	Control n (%)	Statistic	df	p
Education	Primary	17 (16.3)	8 (7.7)	9 (8.7)	$X^2 = 1.549$	2	.461
	Secondary	51 (49.0)	23 (22.1)	28 (26.9)			
	Tertiary	36 (34.6)	21 (20.2)	15 (14.4)			
Marital status	Single	18 (17.3)	11 (10.6)	7 (6.7)	Fisher's = 1.916	2	.438
	Maried/ Cohabiting	85 (81.7)	41 (39.4)	44 (42.3)			
	Divorced/ Widowed	1 (1.0)	0	1 (1.0)			
ANC visits	<4 visits	26 (25.0)	9 (8.7)	17 (16.3)	$X^2 = 3.282$	1	.070
	>=4 visits	78 (75.0)	43 (41.3)	35 (33.7)			

Babies.

The babies' weight at admission (birth weight if born at KNH and weight at admission for referrals in) ranged between 1100 – 4300 grams with a mean weight (M = 2626.0, SD = 678.4) grams, a modal weight of 2900 grams and a median weight of 2700 grams. The babys' weight at discharge ranged between 1740 – 4028 grams with a mean weight (M = 2660.8, SD = 604.0) grams and a median weight of 2800 grams.

The majority of the babies 59 (56.7%) were born pre-term and 90 (86.5%) of the babies born at the Kenyatta National Hospital. Most preterm babies were diagnosed with newborn RDS 40 (27.8%) (Figure 3).
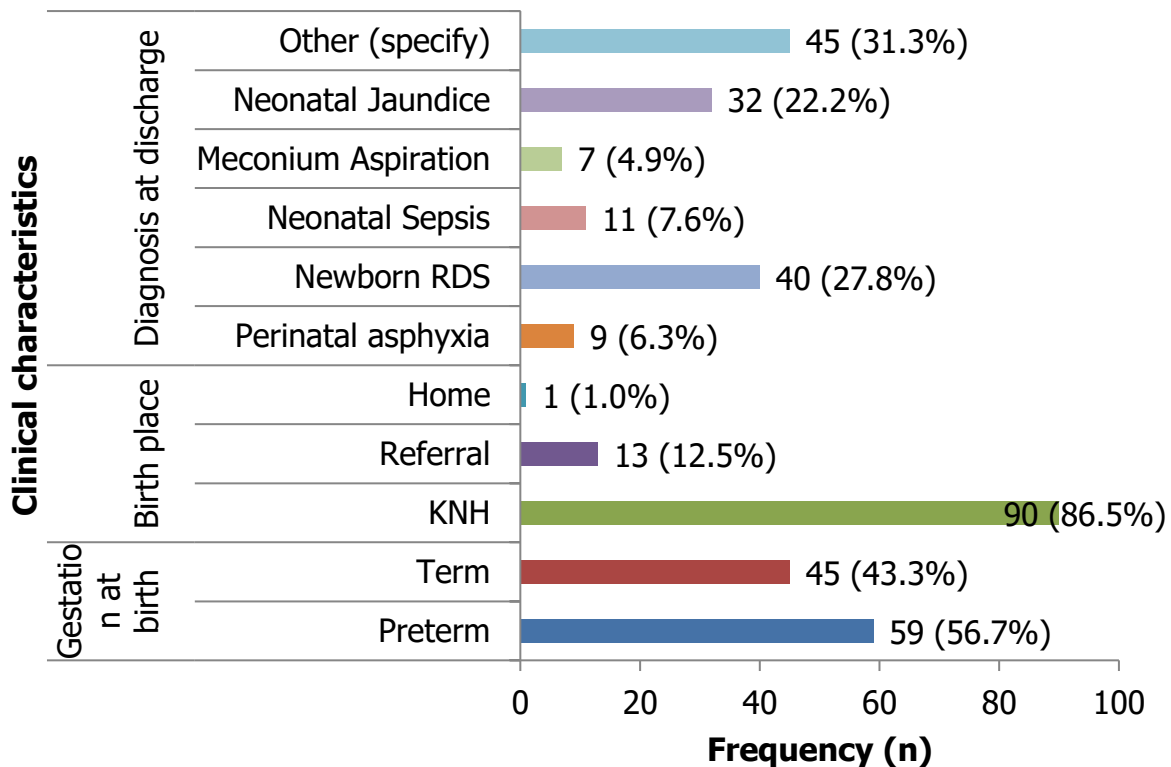

Figure 6 Babies' Clinical Characteristics n=104

<u>Knowledge on Evidence-Based Care of Neonates at 8 weeks.</u>

To determine if there was an increase in knowledge due to the Checklist Intervention, the difference in gain or loss of knowledge for both the control and intervention groups were compared using One-way ANCOVA (analysis of covariance) test. The test was applied to determine whether there are any significant differences in adjusted mean scores between the trained and control groups while statistically controlling for pre – test scores. There were no significant outliers in the data, as assessed by inspection of the boxplot. Post – test scores for each level of trained and control groups were approximately normally distributed as assessed by Shapiro-Wilks test ($p > .05$). Homogeneity of variance was not violated as assessed by Levene's Test for Equality of Variances ($p > .05$). The assumption for homoscedasticity of data was not violated as assessed by inspection of scatter plots.

The One – way ANCOVA test showed a statistically significant difference in mean scores at 8 weeks between the Intervention and control groups (Mean Difference = 9.3, $F = 40.524$, $p < 0.001$) (Table 3). Most knowledge was gained by the intervention group ($M = 67.4$) compared to the control group ($M = 58.1$).

Table 3. One Way ANCOVA (Analysis of Covariance) comparison of mean scores between Trained and Control groups

	Group	n	M	SD		
Between-Subjects Factors	Trained	52	67.3	9.0		
	Untrained	52	58.2	5.4		

		Type III Sum of Squares	df	Mean Square	F	p
	Corrected Model	2239.6	2	1119.8	20.528	.000
	Intercept	6430.7	1	6430.7	117.889	.000
	Pre – test	92.9	1	92.9	1.702	.195
Test of Between-Subjects Effects	Group	2210.5	1	2210.5	40.524	.000
	Error	5509.4	101	54.6		
	Total	417443.8	104			
	Corrected Total	7759.0	103			

				95% Confidence Interval		
		M	SE	Lower	Upper	
Estimates (Marginal Means)	Trained	67.4	1.0	65.4	69.4	
	Untrained	58.1	1.0	56.1	60.2	

					95% CI for Difference	
		Mean Difference	SE	p	Lower	Upper
Pairwise Comparisons	Trained - Untrained	9.3	1.5	.000	6.4	12.1
	Untrained - Trained	-9.3	1.5	.000	-12.1	-6.4

		Sum of Squares	df	Mean Squares	F	p
	Contrast	2210.5	1	2210.5	40.524	.000
Univariate Tests	Error	5509.4	101	54.5		

One – way ANCOVA test was used for all variables. ***p<.001

Table 4 One-way ANCOVA (Analysis of covariance) test for comparison of Means, Adjusted Means, Standard Deviations and Standard Errors for Checklist Intervention Scores for the Trained and Control groups

| Effect | Groups | Checklist Intervention (Scores) | | | | | | | | | |
| | | Between-Subject Factors | | | Marginal Means Estimates | | Pairwise Comparison | | Univariate Tests | | |
		n	M	SD	M	SE	M_Diff.	SE	df	F	p
Overall	Trained	52	67.3	9.0	67.4	1.0	9.3	1.5	1, 101	40.524*	<.001
	Untrained	52	58.2	5.4	58.1	1.0					
Breast Feeding	Trained	52	19.2	2.7	19.2	0.4	0.02	0.5	1, 101	0.001	.977
	Untrained	52	19.2	2.7	19.2	0.4					
Cord Care	Trained	52	14.9	3.1	14.9	0.4	2.9	0.6	1, 101	23.508*	<.001
	Untrained	52	12.0	3.0	12.0	0.4					
Warmth	Trained	52	12.5	4.4	12.3	0.5	2.2	0.7	1, 101	10.294*	.002
	Untrained	52	10.0	0	10.2	0.5					
Vaccination	Trained	52	9.8	1.5	9.8	0.2	0.4	0.3	1, 101	2.183	.143
	Untrained	52	9.4	1.1	9.4	0.2					
Danger Signs	Trained	52	10.9	3.5	10.9	0.4	3.3	0.6	1, 101	32.073*	<.001
	Untrained	52	7.6	2.3	7.6	0.4					

*$p < .05$

The One – way ANCOVA test showed a statistically significant difference in Overall scores, Cord Cord Care & Hygiene, Warmth and Danger Signs means. Adjusted means scores between the Intervention and control groups showed that the most knowledge was gained by the intervention group. (Table 4)

Table 5 Comparison of Pre and Post Intervention Knowledge Scores between Intervention group and Control group

Knowledge score	Pre-Intervention		Post-Intervention	
	Trained	Untrained	Trained	Untrained
Overall	49.6	50.9	67.3	58.2
Breast feeding	19.4	19.6	19.2	19.2
Cord care	8.6	8.9	14.9	12.0
Warmth	10.0	10.6	12.5	10.0
Vaccination	6.4	6.6	9.8	9.4
Danger signs	5.2	5.1	10.9	7.6

Overall Pre-Intervention scores for Breastfeeding were high before intervention with both groups scoring the same before and after intervention. Both groups gained scores on all other aspects post health education and the intervention group gained an overall 10.4 points more than the control group which was educated using the conventional discharge form, signifying that these other aspects of education are relatively less emphasized while in the NBU.

Sociodemographic Factors Associated with Maternal Knowledge

Maternal Age and Level of Education is positively correlated with greater knowledge at 8 weeks.

A Shapiro-Wilk test for normality showed normality for knowledge gain (Statistic = 0.985, df = 104, p = .288), age of mothers' (Statistic = 0.985, df = 104, p = .293), babies' weight gain (Statistic = 0.911, df = 104, p = .725) and non-normality for babies' length of admission (Statistic = 0.740, df = 104, p < .001). A Pearson Correlation Coefficient (r) test showed a statistically significant association between knowledge and mothers' age (Table 4)

Since Pearson Correlation Coefficient (r) test showed a statistically significant correlation between knowledge and mothers' age, a linear regression was run to predict knowledge from mothers age. Mothers age statistically significantly predicted Harris Hip Score (Table 4).

Table 6 Linear Regression Model for Knowledge and Mothers' Age n=104

Model Summary	R	R^2	Adjusted R^2	S.E. of Estimate	p
	.136	.019*	.014	10.046	.050
ANOVA	Sum of Squares	df	Mean Square	F	
Regression	393.862	1	393.862	3.902	
Residual	20791.595	102	100.930		
Total	21185.457	103			
Coefficients	B	S.E.	Beta	t	
Age (years)	.200	.101	.136	1.975	
Constant	50.678	3.036		16.694	

Linear Regression model was used for all variables. *p<.05

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Table 7 Pearson Correlation Coefficient (r) tests for Knowledge gain (n=104)

Knowledge gain	n	r	p
Age (years)	104	.136*	.050
Baby's weight	104	.114	.250

Pearson Correlation Coefficient (*r*) test was used for all variables.
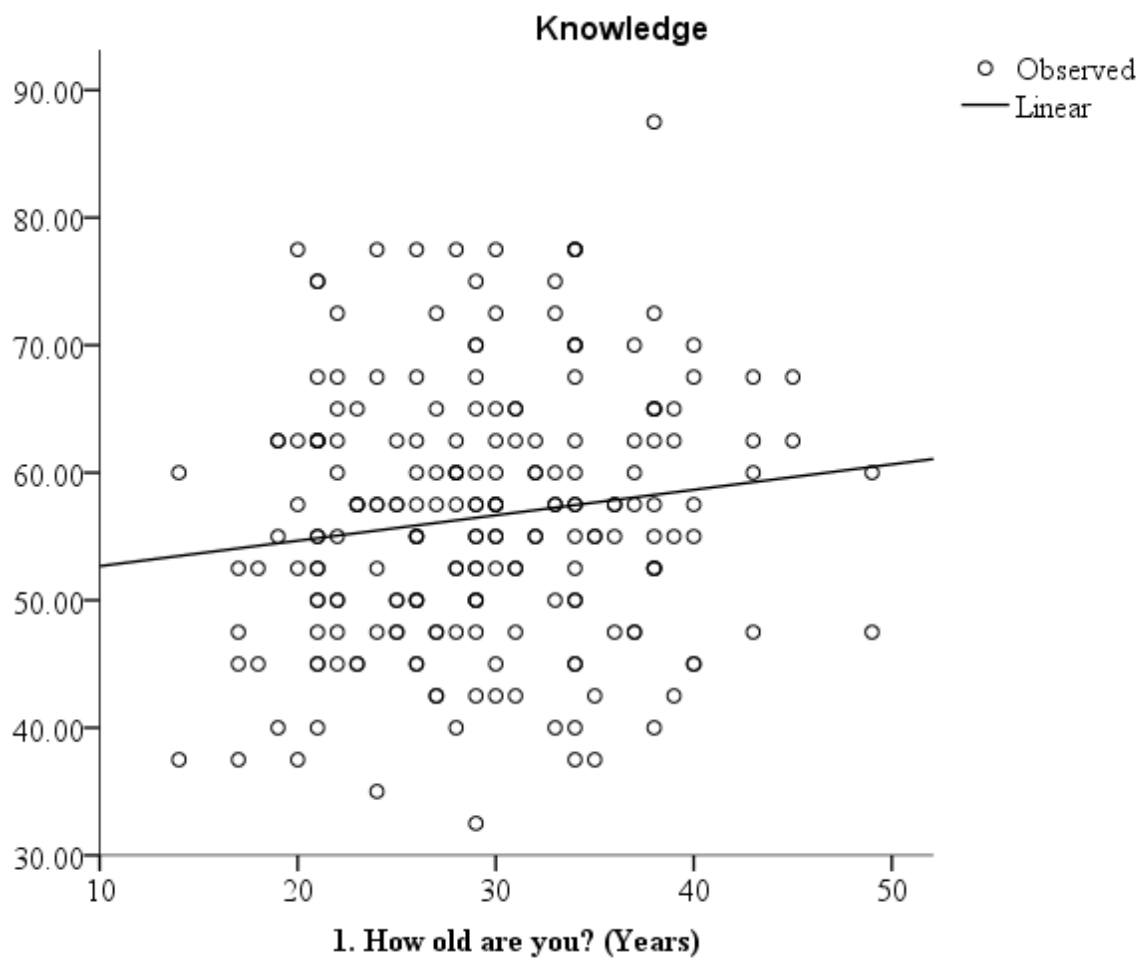
*p<.05

Figure 7 Linear Regression-Knowledge Scores vs Age in Years

Since baby's length of admission violated the normality assumption for Pearson Correlation, the non-parametric test, Spearman's Rank-Order Correlation Coefficient (r_s) was applied. The Spearman's Rank-Order Correlation Coefficient (r_s) showed a statistically significant association between knowledge and mothers' education (Table 7).

Table 8 Spearman's Rank-Order Correlation Coefficient (rs) test for knowledge gain and maternal education n=104

Knowledge gain	n	r_s	p
Baby's length of admission	104	.088	.374
Education	104	.244***	.001
ANC visits	104	.045	.648
Gestation at birth	104	.016	.873
Exclusive breast feeding	104	.062	.534
Readmission at week 8	104	.033	.739

Spearman's Rank-Order Correlation Coefficient (r_s) test was used for all variables.

***p<.001

Readmission rates of neonates discharged from NBU from December 2021-January 2022

Amongst the children 5 (4.8%) were readmitted since discharge, the intervention group had 4 (3.8%) compared to the control group 1 (1.0%). The babies' age at discharge ranged between 1 – 71 days with a mean age (M = 11.0, SD =11.5), a mode age of 5.0 days and a median age of 8.0 days.

All the 5 (4.8%) readmission cases were unscheduled, 2 (2.0%) were due to respiratory complaints while the rest were due to bacterial infection 1 (1.0%), breathing difficulty 1 (1.0%) and irritability 1 (1.0%). No mortality was recorded during this study.

DISCUSSION

There is little information on the effectiveness of a Structured Pre-discharge education to parents of neonates discharged from Newborn Units in Kenya. This study sought out to answer if a structured approach to education would result in gained knowledge on the evidence-based practices around care of neonates and if so, what factors are associated with higher scores. Grouping mothers into intervention and control groups provided an opportunity to compare the effects of a structured pre-discharge education checklist to the conventional discharge procedure.

The Structured discharge checklist contributed to a significantly higher score compared to the conventional discharge form. Education of mothers with a structured pre-discharge checklist was positively correlated with higher scores at 8 weeks post intervention (p value <0.01). There was a statistically significant higher gain in overall knowledge, cord cord care & hygiene, warmth and danger signs in the group educated using the Structured Checklist. This result helps to address the gaps in knowledge as described by Amolo et al where mothers had lower knowledge scores on cord care, warmth and danger signs. With only 4/380 mothers in the study knowing how to appropriately clean the umbilicus. Aspects of early newborn care such as these are not taught in a standardized way. As such, education imparted on all five evidence-based aspects of newborn care like hygiene and cord care, which are often assumed to be well known had positive effects on maternal knowledge.

There was no statistically significant difference in knowledge acquired on breastfeeding and immunization, consistent with the emphasis on breastfeeding and immunization in NBU. The WHO guide on essential practice for Pregnant women and Children and the first 1000 days campaign encourages exclusive breastfeeding for a minimum of 6 months. This has encouraged widespread teaching around the aspects of breastfeeding and as such, most of the mothers pre and post admission were well aware of these aspects of neonatal care. The study was also carried out during a period of a county-

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wide supplementary immunization program. (Ref)This may have contributed to minimal gain in knowledge around the vaccination session.

Residual Knowledge at 8 weeks was found to be significantly higher in the Intervention group with a mean difference of 9.3 (p value of .001). Mukarubayiza et al described gain in knowledge scores of 38% in a pre-posttest study carried out in Rwanda, whereby education was imparted to parents of neonates in a NICU using the Global Health Network audiovisual stream. This study, however was not a controlled study and as such did not compare trained and control groups to power its results. The posttest was also offered immediately after the training and could not elaborate on the possible decay of knowledge that occurs due to time. This study showed that the group trained using a standardized checklist had gained in knowledge 8 weeks after pre-discharge education. Despite the fact that residual knowledge cannot be completely investigated simply by an 8 week lapse prior to a posttest, this study offers an opportunity to investigate the lasting effects of Health Education trainings offered to parents.

There was a borderline correlation between with higher knowledge scores at 8 weeks and ages of mothers (p value of 0.05) Older mothers had higher overall scores, when analyzed through linear regression and this brought to question the aspect of parity. Age and Level of Knowledge presents as a possible confounder(32), as the chances of an older parent having a higher parity and cumulatively being exposed to health education throughout the pregnancies and birth may contribute to this disparity. Older mothers also have better support structures that provide them the opportunity for informal networks of education that resulted in better knowledge scores. Higher levels of education also positively correlated with a greater gain in overall knowledge at 8 weeks. This was in line with the findings by Herval et al whereby maternal education is reported as a determinant of Child Health.

Proportion readmitted were at 4.8%, with no statistically significant difference between the trained and control groups unlike Odundo et al, which found a 4.2% reduction in readmission post-educational intervention.

CONCLUSIONS

1. Use of a Structured Pre-discharge Checklist improves overall knowledge on care of neonates and in aspects of cord care, warmth and danger signs. A checklist ensures that all aspects of evidence-based education are imparted to parents upon discharge, leaving no themes to chance. This shows that emphasis on aspects of cord care, warmth and danger signs should be made, so as to standardise parental knowledge on all matters of early neonatal care upon discharge.

2. Age and Education is positively correlated with greater gain in knowledge on care of neonates post-checklist and as such age of mothers should be considered when imparting health education upon discharge from NBU.

3. Mothers in this population have good knowledge on breastfeeding and immunization. This can inform the amount of time required in these topics during education of parents as well as maintain confidence in the importance of consistency in provision of health education.

RECOMMENDATIONS

1. Inclusion of an Education Checklist for HCW in the NBU to improve knowledge on all aspects of care of neonates at home.

2. Special attention should be focused on younger mothers and mothers with lower education levels during the discharge counselling process.

LIMITATIONS AND STRENGTHS

Limitations

Being a quasi-experimental study, differences between the control and intervention groups may influence the measured results and the possibility of confounders, both anticipated and hidden, may lead to erroneous conclusions. However, multivariate analysis helped to minimize some of these effects.(33)

Information on Parity of Mothers was not collected and as such this study does not report on its influence on knowledge gained post intervention.

Trained and Control groups were not randomly allocated and as such Age of Mothers exhibited a skewed distribution.

The study was entirely voluntary and assumed that the information given by the mothers is truthful and accurate, upon interview before and after intervention, as the principal investigator and assistant aimed to give evidence-based information.

There was a chance of recall bias especially upon the follow-up interview process, which could have influenced the interpretation of results. This was avoided by the use of a high-quality questionnaire and intentional training of research assistants.

The research was not blinded, however use of coded information upon data analysis aimed to prevent bias.

Requiring mothers to have a reliable phone contacts left the study vulnerable to participants dropping out of the study due to loss to follow-up. To counteract this, each study arm had a recruitment of an extra 10 percent in order to ensure the minimum sample size is satisfied.

Strengths

The Interventional design of the study allowed measurement of the impact of the Educational checklist.

The aspect of time (8week lapse) allowed for testing of the residual knowledge after initial intervention

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1. GANTT CHART

The following is the proposed time frame of the study process

Activity	Jan	Feb	March	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	March	April
Proposal development and defense	■	■	■	■	■											
Ethical clearance						■	■	■	■	■	■					
Data collection												■	■			
Data Analysis														■	■	
Presentation of Results																■

2. STUDY BUDGET

Category	Remarks	Units	Unit Cost (Kshs)	Total (Kshs)
Proposal development	Printing drafts	1000 pages	5	5000
	Proposal copies	8 copies	500	4000
Data Collection	Stationary packs	10	100	1000
	Training Research Assistants	1 day	1000	1000
	Research Assistants	8 weeks	18000 x 2	36000
Data Analysis	Statistician	1		35000
Thesis Write up	Computer services			5000
	Printing drafts	1000 pages	5	5000
	Printing Thesis	10 copies	500	5000
Contingency Funds				20000
TOTAL				**11700**

3. CONSENT FORM

CONSENT FORM
Code Number of Mother: _____ Date:_____(dd/mm/yy)

Study Title: STRUCTURED PRE-DISCHARGE EDUCATION ON CARE OF NEONATES TO MOTHERS OF BABIES DISCHARGED FROM NBU-AN INTERVENTIONAL STUDY
Investigator:
Dr. Stephanie Wakaba (MBChB), Tel Number: 0701562408 Department Of Paediatrics and Child Health, University Of Nairobi.
Supervisors:
a)   Prof. Aggrey Wasunna (MBChB, M. MED, Fell Neonatology)

Professor, Department Of Paediatrics And Child Health, University Of Nairobi.

b)   Dr. Lawrence Owino (MBChB, MMED Fell Rheumat)

Lecturer, Department Of Paediatrics And Child Health, University Of Nairobi.

Investigator's Statement:
We are requesting you to kindly participate in this research study. The purpose of this consent form is to provide you with the information you will need to help you decide whether to participate in the study. This process is called 'informed consent. Please read this consent information carefully and ask any questions or seek clarification on any matter concerning the study with which you are uncertain. The investigator will be available to answer any questions that arise during the study and afterward.

Introduction:
Upon discharge from the hospital, parents continue with the care of their babies at home and are responsible for the health and well-being of their child. At discharge, parents are usually taught on the interventions to prevent sickness and death of their babies while at home. This study aims to investigate how to improve health education among mothers on the care of their infants at home.

Benefits:
The findings of this study will be used to improve the education of mothers before discharge.

Risks:

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There will be no risks to you or your child and no invasive procedures will be carried out in the study that may harm your child.

Voluntariness:
The study will be fully voluntary. There will be no financial rewards to you for participating in the study. One is free to participate or withdraw from the study at any point. The study will call for some of your time. Those that withdraw or refuse to participate will not compromise you or your child's care in any way.

Confidentiality:
All the information obtained from you will be held in strict confidentiality. Any information that may identify you or your child will not be published or discussed with any unauthorized persons. No specific information regarding you, your child or your family will be released to any person without your written permission. Your research number will be used in place of your names. We will however discuss overall findings regarding all children who participated in the study without revealing you or your child's identity.

Problems or Questions:
If you ever have any questions about the study or about the use of the results you can contact the principal investigator, Dr Stephanie Wakaba @ 0701562408.
If you have any questions on your rights as a research participant you can contact the Kenyatta National Hospital Ethics And Research Committee (KNH- ERC) By Calling 2726300 Ext. 44355.

I, having received adequate information regarding the study research, risks, benefits hereby agree / disagree (cross out as appropriate) to participate in the study. I understand that my participation is fully voluntary and that   I am free to withdraw at any time. I have been given adequate opportunity to ask questions and seek clarification on the study and these have been addressed satisfactorily.
Parents Signature: _____ Date: _____
Witness signature (for those who cannot read or write)
_____

I declare that I have adequately explained to the above participant, the study procedure, risks, and benefits and given him /her time to ask questions and seek clarification regarding the study. I have answered all the questions raised to the best of my ability.

Interviewer's Signature: _____ Date: _____

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KIAMBATISHO

KIAMBATISHO: FOMU YA IDHINI

Nambari ya Msimbo ya Mama: _____ Tarehe : _____ (dd / mm / yy)

Kichwa cha Utafiti: MFUMO WA ELIMU WA KUENEZA MAFUNZO KUHUSU KUTUNZA WATOTO NYUMBANI KWA MAMA WA WATOTO WALIOPEWA RUHUSA KWENDA NYUMBANI KUTOKA NBU - MAFUNZO YA KIINGILIA

Mchunguzi:
Dk Stephanie Wakaba (MBChB), Tel Idadi: 0701562408 idara ya Paediatrics na Mtoto Afya, Chuo Kikuu cha Nairobi.

Wasimamizi:
a) Profesa Aggrey Wasunna (MBChB , M. MED, Fell Neonatology)

Profesa, Idara ya Watoto na Afya ya Mtoto , Chuo Kikuu Cha Nairobi.

b) Dk Lawrence Owino (MBChB , MMED Fell Rheumat)

Mhadhiri, Idara ya Watoto na Afya ya Mtoto , Chuo Kikuu Cha Nairobi.

Taarifa ya Mchunguzi :
Tunakuomba ushiriki kwa fadhili katika utafiti huu. Madhumuni ya hii aina ya ridhaa ni kukusaidia kuamua kama utashiriki katika utafiti huu. Hii mchakato ni kuitwa 'habari ridhaa. Tafadhali soma habari hii ya idhini kwa uangalifu na uulize maswali yoyote au utafute ufafanuzi juu ya jambo lolote kuhusu utafiti ambao hauna uhakika nao. Mchunguzi atapatikana kujibu maswali yoyote yanayotokea wakati wa utafiti na baadaye.

Utangulizi:
Baada ya kutoka hospitalini, wazazi wanaendelea na utunzaji wa watoto wao nyumbani na wanawajibika kwa afya na ustawi wa watoto wao. Wakati wa kutoka hospitalini, wazazi kawaida hufundishwa juu ya hatua za kuzuia magonjwa na vifo vya watoto wao wakiwa nyumbani. Utafiti huu unalenga kujaribu ikiwa kufundisha akina mama wanaotumia orodha ya kuangalia kutaboresha maarifa na utunzaji wa watoto wao nyumbani.

Faida:

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Matokeo ya utafiti huu yatatumika kuboresha elimu ya akina mama kabla ya kupewa ruhusa kwenda nyumbani.

Hatari:
Hakuna hatari kwa wewe au wako mtoto na hakuna vamizi taratibu itafanyika   nje katika utafiti mbayo inaweza kudhuru mtoto wako.

Kujitolea:
Utafiti huo utakuwa kwa hiari kabisa. Hakutakuwa na tuzo za kifedha kwako kwa kushiriki katika utafiti. Mtu yuko huru kushiriki au kujiondoa kwenye utafiti wakati wowote. Utafiti huu utahitaji wakati wako. Kukataa kwa kushiriki haitaathiri wewe au mtoto wako huduma kwa njia yoyote.

Usiri:
Habari yote iliyopatikana kutoka kwako itahifadhiwa kwa usiri mkubwa. Habari yoyote inayoweza kukutambulisha wewe au mtoto wako haitachapishwa au kujadiliwa na watu wasioidhinishwa. Hakuna habari maalum kukuhusu wewe, mtoto wako au familia yako itakayotolewa kwa mtu yeyote bila ruhusa yako ya maandishi. Nambari yako ya utafiti itatumika badala ya majina yako. Siri itakuwa hata hivyo kujadili matokeo ya utafiti wa jumla kuhusu watoto wote walioshiriki katika utafiti bila kuonyesha wewe au utambulisho wa mtoto wako.

Shida au Maswali:
Kama una maswali yoyote kuhusu utafiti au kuhusu matumizi ya matokeo, unaweza kuwasiliana na mpelelezi mkuu, Dr Stephanie Wakaba @ 0701562408.
Kama una maswali juu ya haki yako, ama utafiti kama mshiriki, unaweza kuwasiliana na Kenyatta National Hospital, Maadili Na Kamati ya Utafiti (KNH- ERC) Kwa Kupiga Simu 2726300 Ext. 44355.

Nimepokea taarifa za kutosha kuhusu utafiti na faida ya kukubali / kutokubali na kushiriki katika utafiti. Ninaelewa kuwa ushiriki wangu ni kwa hiari kabisa na ya kwamba niko huru kujiondoa wakati wowote. Nimepewa fursa ya kutosha kuuliza maswali na kutafuta ufafanuzi kuhusu utafiti na kuwa nimeridhishwa nilivyoshughulikiwa.

Saini ya Mzazi:_____Tarehe_____(dd/mm/yy)
Saini ya shahidi (kwa wale ambao hawawezi kusoma au kuandika)
_____

Natangaza kwamba mimi nimeeleza vya kutosha ushiriki, kwa utaratibu juu ya utafiti, hatari, faida na mzazi amepewa muda wake kuuliza maswali na kutafuta ufafanuzi kuhusu masomo. Mimi nimejibu maswali yote yaliyotolewa kwa uwezo wangu wote.
Tarehe ya Saini ya Mhojiji_____ (dd/mm/yy)

4. QUESTIONNAIRE

DATE: _____/_____/_____ (dd/mm/yyyy)

Participant Study Code: _____

Mobile Phone Number: _____

SOCIODEMOGRAPHICS

1. How old are you? _____

2. Date of baby's admission:____/_____/_____

3. Date of baby's discharge:____/_____/_____

4. Diagnosis at discharge: _____

5. Weight at admission: (gms) _____

6. Age at Discharge _____

7. Weight at Discharge (gms) _____

8. Level of education completed:

      i)   None

      ii)   Primary Level

      iii)   Secondary Level

      iv)   Tertiary Level

9. Marital status:

    i)   Single

    ii)   Married/Co-habiting

    iii)   Divorced/Separated

    iv)   Widowed

10. Number of ANC visits:

    i)   none

    ii)   <4 visits

    iii)   >4 visits

11. Gestation of baby admitted at birth:

    i)   Preterm

    ii)   Term

12. Place of Birth of baby:

    i)   Kenyatta National Hospital

    ii)   At home

    iii)   Referral from another hospital

HEALTH EDUCATION:

a) Breastfeeding:

    i) Is it advisable to give your baby something else other than breastmilk in the next 2 months?

- Yes
- No

    ii) How long are you to exclusively breastfeed for? (open ended)

- First 6 months of life
- Other (specify)

b) Cord care and hygiene:

    i) How do you care for the cord? (open ended)

- By keeping the cord dry/chlorhexidine/spirit-answer
- Other (specify)

    ii) Why is it important to wash my hands? (open ended)

Answer: It prevents my child from getting sick

- Other (specify)

c) Warmth

    i) List 2 ways to ensure that your baby is kept warm. 2 points

- Dressing the baby in more than 1 layer of clothes and a cap
- Heating the room
- Skin to skin contact
- Others (specify)

d)   Immunization and growth:

i)   When should baby be immunised according to KEPI?
(Multiple answers are allowed)

- At birth
- At 6 weeks
- At 10 weeks
- At 14 weeks
- At 9 months
- At 18months
- Others (specify)

ii)   Why is it important to vaccinate your child?

e)   List/mention which signs if I see, I need to visit the hospital immediately: (Open-ended)

- Yellow eyes/feet/body
- Fast breathing
- Chest wall in-drawing
- Convulsions
- Too hot
- Too cold
- Vomiting
- Not Breastfeeding
- No spontaneous movement

Variables at 8 weeks:

1. Are you feeding your child anything outside of breastmilk?

   - Yes

   - No

2. What is the current weight of your baby?(gms) _____

3. Did you attend your first Neonatal Outpatient Clinic for review after discharge?

   - Yes

   - No

4. Has your child been admitted at a hospital since discharge?

   - Yes

   - No

If Yes, for which procedure and was it scheduled?

5. Which vaccinations has your child received so far?

   - Oral Polio Vaccine, BCG, Hepatitis B

   - Oral Rotavirus and Oral polio at 6 weeks

   - Intramuscular HIB/HepB/DPT

5. CHECKLIST

Introduction.

1. Introduce yourself and your job description. (e.g.: Doctor/Clinical officer/Nurse)
2. Ask for mother's name and her child's name

Discharge.

1. Explain that baby has been discharged
2. Explain nature of diagnosis (main and alternative diagnoses)
3. Ask patient if they have any questions

Health education on evidence-based care of neonate at home:

1. Care of cord and hygiene:
   i)   Keep cord dry/wipe with 7% chlorhexidine
   ii)   Points of Hand washing:
      - Before touching the baby
      - After diaper change
      - Before expressing breastmilk
      - Before cleaning the cord

2. Breastfeeding:

   i)   Exclusive breastfeeding till 6 months of age
   ii)   Allowance of medication and vitamins

3. Warmth and temperature control in ambient temperatures:

   i)   One or two more layers of clothes than adults
   ii)   Use of hats and caps to maintain temperature

4. Immunisation:

     i)   Importance of vaccines:

- Prevention of common illnesses that cause death and disabilities

     ii)   Go through schedule as per MCH booklet

5. Go to the hospital if baby has any of the following danger signs:

     i)   Yellow eyes/feet/body
     ii)   Fast breathing
     iii)   Chest wall in-drawing
     iv)   Convulsions
     v)   Too hot
     vi)   Too cold
     vii)   Vomiting
     viii) Not Breastfeeding
     ix)   No spontaneous movement

6. Explain medication issued with indications for each and any follow-up clinics.

7. Ask if mother has any questions or concerns and confirm 8-week phone call appointment.

ETHICS APPROVAL

UNIVERSITY OF NAIROBI
FACULTY OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/399

28th October, 2021

Dr. Stephanie Wakaba
Reg. No.H58/34410/2019
Dept. of Paediatrics and Child Health
Faculty of Health Sciences
University of Nairobi

Dear Dr. Wakaba

RESEARCH PROPOSAL: STRUCTURED PRE-DISCHARGE EDUCATION ON CARE OF NEONATES TO MOTHERS OF BABIES DISCHARGED FROM THE KENYATTA NATIONAL HOSPITAL NEWBORN UNIT – A QUASI EXPERIMENTAL STUDY (P309/05/ 2021)

This is to inform you that KNH-UoN ERC has reviewed and approved your above research proposal. Your application approval number is **P309/05/2021**. The approval period is 28th October 2021 – 27th October 2022.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by KNH-UoN ERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KNH-UoN ERC 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH-UoN ERC within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to KNH-UoN ERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Protect to discover

Yours sincerely

PROF. M.L. CHINDIA
SECRETARY, KNH-UON ERC

c.c.   The Dean-Faculty of Health Sciences, UoN
       The Senior Director, CS, KNH
       The Chairperson, KNH- UoN ERC
       The Assistant Director, Health Information, KNH
       The Chair, Dept. of Paediatrics and Child Health, UoN
       Supervisors: Prof. Aggrey Wasunna, Dept. of Paediatrics and Child Health, UoN
                      Dr. Lawrence Owino, Dept.of Paediatrics and Child Health, UoN

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