



**FACTORS ASSOCIATED WITH THE INITIATION OF BREASTFEEDING WITHIN ONE  
HOUR OF DELIVERY AT KENYATTA NATIONAL HOSPITAL**

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**H58/6804/2017**

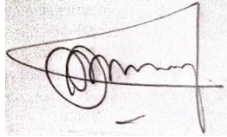
**Department of Obstetrics and Gynaecology**

**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
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**2022**

**DECLARATION**

I declare that this dissertation my original work and that it has not been submitted, in whole or in part, in any previous application for a degree or certificate. Except where states otherwise by reference or acknowledgment, the work presented is entirely my own.



26/05/2022

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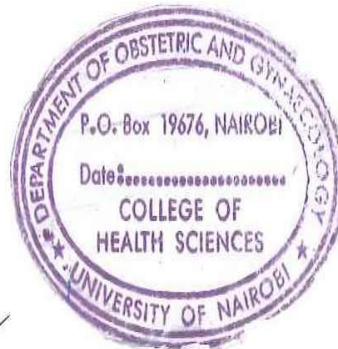


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## **DEDICATION**

I dedicate this thesis to my wife and children, thank you for your continued love and support.

## **LIST OF ABBREVIATIONS**

ANC	Antenatal care
BFI	Breastfeeding initiation
CBD	Central business district
CS	Caesarean section
EIBF	Early initiation of breastfeeding
HIV	Human immunodeficiency Virus
IQ	intelligence quotient
KNH	Kenyatta National Hospital
LAM	Lactation amenorrhoea Method
ORS	Oral rehydration solution
PLF	prelacteal feeds
SD	standard deviation
SDGs	Sustained Development Goals
SHS	Shillings
SVD	Spontaneous Vertex Delivery
UNICEF	United Nations International Children's Emergency Fund
UoN	University of Nairobi
WHO	World Health Organisation

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## ABSTRACT

**Background:** The World Health Organization (WHO) recommends that Neonates be breastfed immediately after birth to reduce neonatal mortality, stimulate milk production, and reduce the incidence of postpartum hemorrhage. Understanding the factors of EIBF is necessary to trigger facility staff and health policymakers to implement high impact EIBF interventions. However, the assessment of EIBF has often been as a report by mothers or as an intent to breastfeed without actual evidence of EIBF. The use of LATCH (latch, audible swallow, type of nipple, comfort, hold) Tool eliminates systematic differences occurring due to reporting biases by postpartum mothers on whether they practiced breastfeeding or not.

**Study Objective:** To determine the factors associated with the establishment of breastfeeding within one hour of delivery at Kenyatta National Hospital (KNH).

**Methodology:** This was a facility-based cross-sectional study of 108 women who delivered at 34 weeks or above in KNH. The LATCH tool offered a standardized method of assessment of breastfeeding to minimize observer bias. Participants were scored with this tool. A score of 5 and above denotes success, while below 5 denotes no success. The rate of EIBF, maternal, and neonatal characteristics was described using frequency distribution. Chi-square ( $\chi^2$ ) test or Fisher's exact test *p*-value was used for comparison of LATCH scale items in single and married women appropriately. Stepwise multivariable logistic regression was used to investigate the factors independently associated with EIBF.

**Results:** The mean age of participants was 26.57 years [standard deviation (SD),  $\pm$  5.79], and a range of 18–51 years. Six in ten (63.9%) were married, 3.3% – single, 0.9% – divorced, 1.9% – widowed, 16.7% – primary education, 51.9% – secondary education, and 31.5% – post-secondary education and 68% were unemployed. Of the 108 mother-infant dyads, 63 (58.3%) achieved successful LATCH. After controlling for other factors, the odds of establishing breastfeeding within one hour of childbirth were lower if the mother had a salaried job than being unemployed [adjusted odds ratio (aOR): 0.07, 95% CI: 0.01–0.89, *p*-value = 0.027]. Infants who were born through spontaneous vertex/vaginal delivery (SVD) had seven-fold higher odds of establishing breastfeeding within one hour than those who had a caesarean section (aOR: 7.14, 95% CI: 2.33–21.9; *p*-value < 0.001).

**Conclusion:** Breastfeeding in the first hour after delivery was 58.3% but was still below the WHO recommendation that all mothers should practice EIBF. The use of a standardized tool

(LATCH) will enable systematic assessment of breastfeeding and can be incorporated into the patient file as part of the postpartum assessment.

## CHAPTER ONE

### 1. INTRODUCTION

#### 1.1 Physiology of lactation

Breastfeeding refers to infant feeding at the mother's breast. Lactation is the physiological secretion of milk by mammary glands and forms an important part of early infant nutrition providing both nutrition and immune protection to the newborn. Lactation failure/deficiency (agalactia /hypoagalactia) is a medical condition in which lactation fails or is insufficient for the infant's needs.

The physiology of lactation can be described in four stages;

1. Mammogenesis- associated with ductal and glandular growth of the breast during pregnancy. Progesterone and oestrogens play an important role.
2. Lactogenesis- is the synthesis and secretion of milk from alveoli. Prolactin is a key hormone during this stage.
3. Galactokinesis- refers to the ejection of milk/milk let-down reflex. It requires both suckling (or mechanical stimulation) and contraction of smooth muscle in the breast mediated by oxytocin.
4. Galactopoeisis-Prolactin is the single most important hormone for the maintenance of effective and continuous lactation in combination with suckling.

Milk production is estimated at 500-800ml per day, which offers adequate nutrition for the infant for up to 6 months where complementary feeds are required (1).

#### 1.2 Background of the study

Exclusive breastfeeding as per the WHO definition is infant feeding on breast milk alone which may be via a wet nurse or expressed, for 6 months after birth except for medication for example ORS in dehydrated infants. Benefits to the mother include LAM as a contraceptive method, and a decrease in cost to the household as formula feeds are often expensive.

The WHO recommends all newborns be placed in skin-to-skin contact with their mothers immediately after birth, to support the establishment of quality breastfeeding within 1 hour after birth and to exclusively breastfeed the child until 6 months and continue with breastfeeding and complementary feeds for up to 2 years (2). There are few exceptions to this recommendation i.e. babies on medication.

As per WHO recommendations all facilities providing maternal-child health services including conducting deliveries should, as part of the hospital baby-friendly initiative(3).Ten steps include:-

1. Facilities should have a clear written breastfeeding policy that all health care providers should be aware of
2. All health care workers should be are trained on the policy and skills to provide support and routinely assess
3. During antenatal care, mothers should be sensitized on the management and importance of breastfeeding.
4. Care after delivery-mothers should be encouraged to breastfeed within one hour of delivery.
5. Offer support to mothers after delivery to maintain proper breastfeeding practices.
6. Supplementation-offer human milk from breast milk banks as a priority and supporting those opting for formula
7. Allow mothers and infants to remain together (rooming-in) and facilitate access for mothers with sick infants
8. Practice responsive feeding (breastfeeding on demand)
9. Avoid artificial teats or pacifiers during the breastfeeding period.
10. Encourage the formation of breastfeeding community support groups and link mothers to them (3).

This study aimed to determine the proportion of women with breastfeeding establishment at 1 hour after delivery as per the WHO recommendations. As well as, the factors affecting establishment including socio-demographical, use of prelacteal feeds and proper breastfeeding practices assessed via the LATCH tool.

## CHAPTER TWO

### 2. LITERATURE REVIEW

#### 2.1 Global perspective

Early breastfeeding initiation within 1 hour is estimated at 50% in low and middle income countries, documented benefits include a decrease in neonatal admissions in the Newborn unit as well as reduced neonatal mortality, stimulation of milk production and decreased incidence of postpartum hemorrhage Kenzo et al. (4). The investigators conducted a secondary data analysis of the WHO GS dataset (Africa, Latin America, and Asia). A population of 281100 deliveries was studied results revealed early breastfeeding initiation at 1 hour was 57.6% and 37.2% above 1 to 24 hours. Data from Kenya was retrieved from the study a total of 13532 live births were assessed in 20 facilities results initiation at 1 hour was 58.7% and 39.4% above 1 to 24 hours (4). The analysis was carried out based on data from two provinces in Kenya, which is a multicultural country and was from secondary data. Kenyatta National Hospital as a tertiary facility has a national outlook hence the choice for study site of this study.

Breastfeeding is integral in the achievement of sustainable development goals (SDGs), as part of women's and child's health. Goals 1, 8, and 10 focus on economic empowerment by poverty elimination, promoting economic growth, and reducing inequalities. Breastfeeding reduces the need for often expensive infant formula with poor nutritional value and with its added value to the child's immunity decreases hospital admissions. This in turn empowers spending in family budgets for other critical areas. UNICEF estimates it is adding 302 billion USD annually to the world economy or 0.5% of the World's gross national industry. Goals 1 and 3 zero in on Hunger and health wellbeing the nutritional value of breastmilk has been studied over the years and its value cannot be underestimated, not only as infant food but in its immunological role and emotional bonding between mother and child leading to better psychosocial development. Goal 4 is on education studies that have shown a direct correlation between breastfeeding and high IQ. Horta et. al (5). in a systemic review and meta-analysis of 17 articles revealed an IQ difference of up to 3-4 points in breastfed individuals. The mean was 3.44 with a confidence interval of 95% (5) Goal 5 gender equality current national issues being discussed in Kenya and globally including the right to breastfeed without embarrassment or victimization in public areas, and creation of lactation rooms at workplaces. Where mothers can express milk freely and storage facilities. Other



issues include increasing maternity leave to 6 months as opposed to the current 3 months to facilitate exclusive breastfeeding and paternal leave to 3 months. Birth spacing allows for better planning for utilization of available resources and lactation amenorrhea as a contraceptive method empowers women to decide when to get pregnant. Goals 12 and 13- Responsible consumption and production/climate action, lactation is green has minimal impact on the carbon footprint, whereas formula feeds utilize non-biodegradable materials e.g. plastics and metallic wastes with issues arising from disposal leading to pollution (6)

Riadh et al. (7) carried out a study in Tabuk Saudi Arabia conclusion was that 92.8% initiated breastfeeding by 48 hours after birth and that caesarian section, preterm delivery/low birth weight had a negative impact on initiation, recommended discouragement of infant formula use in hospitals and maternal support to encourage breastfeeding.

Mathur et al. evaluated lactation failure in 75 mother-infant unit admissions GSVM Medical College, Kanpur in India below 4 months postpartum (8). Results revealed partial failure (94.7%) with total failure at 5.3%. Factors including education, parity, income, age, religion, family structure, and urban/rural residence of the mother--all had an impact on the occurrence of lactation failure. Other findings include-in 77.3% initiation of breastfeeding were delayed for 2 to 5 days usually for cultural reasons and while 92% of the mothers felt that the milk output was inadequate (8).

## **2.2 Kenyan perspective**

A 2015 study at KNH by Ojigo (9) evaluated the adherence to the 10 steps baby-friendly hospital initiative at the KNH maternity unit. In the study, 103 postpartum mothers and 72 healthcare workers were sampled. The mothers had a mean age of 27 range 15 to 40 years (SD, 5.5), while health care workers had a mean age of 37 years (SD, 10.2). The 10, WHO baby friendly hospital initiative steps (10) are listed in the background of this study. The results revealed 40% adherence with full compliance to steps 6, 7, 8 and 9. For steps, 1, 2,3,4,5 and 10 did not meet the WHO standard for compliance. In further analysis of early initiation of breastfeeding multiparas (55%) was more likely to establish than primipara (37%) however this was not significant with a p-value of 0.142 (9). The strengths of the study included an ability to observe the indicators through practical skills assessment and confidentiality during interviews minimized falsification of data. Limitations included recall bias in recalling ANC information and a small sample size thus a correlation between infant mortality/morbidity and initiation of breastfeeding could not be made.

Lakati et al. (11) Assessed the effect prelacteal feeds on exclusive breastfeeding in Nairobi, Kenya. The most common feed being glucose solution and infant formula. A sample size of 692 women was recruited after delivery and followed up for six months drawn from five major hospitals in Nairobi. The prevalence of pre-lacteal feeding was found to be 26.8% with a 95% CI 23.5%-30.1%). Pre-lacteal feeding was more prevalent in infants born through caesarean section at (47.4%) in contrast to vaginal delivery (19.3%). One hospital had a 93% prevalence in pre-lacteal feeding. Pre-lacteal feeding was found to be a significant predictor for early breastfeeding cessation (11).

A study was carried out in August 2014 at KNH and Pumwani hospitals in by Baya et al. (12) to evaluate the correlation between caesarean section and initiation of breastfeeding. Also evaluated was the prevalence of prelacteal feeds. 192 from Pumwani and 193 KNH were recruited to the study. Study results found that 25% had initiated breastfeeding within 1 hour and 24% initiated after 6 hours the median time at 1.5 hours at KNH while at Pumwani hospital the median time of initiation was 6 hours (12). Factors result leading to the delays included theatre to ward transfer delays and prelacteal feeds which accounted for 8.8 % of neonates who had received prelacteal feeds (12). Married women were 25.8% more likely to initiate breastfeeding than single at 21.8% p-value <0.53, while prim-para 23.5% and multi-para 29.2% p-value <0.24 concluding that as much as there was a difference in establishment rates it was not of statistical significance. This study differs in that it utilised interviewer based observations to assess breastfeeding rather than a scoring system and vaginal deliveries were excluded from the study population.

### **2.3 Assessment Tool**

The LATCH scoring system(13) is a tool that was developed to assess the establishment of breastfeeding and aide in documentation to standardize the assessment of lactation, Jensen D et.al. (14) discovered the subjective questionnaires that existed classified establishment as either well, fair and poor were not only inaccurate but did not identify problem areas to be addressed. The LATCH system was developed that scored the establishment of breastfeeding using five categories. Each component is scored between 0 to 2 with a maximum total of 10. A score of 5 and above is considered favourable. This offered a systematic and standardized tool to assess the quality of breastfeeding. This will overcome observer biases by structuring the assessment of breastfeeding practice.

Table 1. Lactation Assessment Tool developed by Jensen D et al (14).

	0	1	2
Latch	Too sleepy or reluctant or No latch achieved	Repeated attempts Hold nipple in mouth stimulate to suck	Grasps breast Tongue down Lips flanged Rhythmic sucking
A audible swallow	None	A few with stimulation	Spontaneous and intermittent
T type of nipple	inverted	Flat	Everted (after stimulation)
C- Comfort(breast/nipple)	Engorged Cracked, bleeding, large blisters, or bruises Severe discomfort	Filling Reddened/small blisters or bruises Mild/moderate discomfort	Soft Tender
H hold/positioning	Full assist (staff holds infant at the breast)	Minimal assist (i.e., elevate head of bed; place pillows for support.)  Teach one side; mother does other  Staff holds and then mother takes over	No assist from staff  Mother able to position/hold infant

## 2.4 Justification

Breast is best as per WHO/UNICEF recommendations and the available literature corroborates this fact. Lancet neonatal survival series identifies breastfeeding as one effective intervention that can reduce 55–87% of all-cause neonatal mortality and morbidity (15). WHO recommends early breastfeeding initiation as part of postnatal care and the baby-friendly hospital initiative. However, available studies estimate the initiation of breastfeeding at 1 hour to be 50%. With these figures, it is critical to understand the contributing factors to delays. The systematic LATCH tool offers a systematic qualitative assessment of breastfeeding. This may help in developing strategies to offer support to vulnerable women who experience failure, as well as train health workers on a systematic assessment of breastfeeding.

## **2.5 Research Question**

What are the factors affecting the establishment of breastfeeding within 1 hour of delivery at Kenyatta National Hospital?

What is the proportion of women able to achieve good LATCH within 1 hour of delivery at Kenyatta National Hospital as per WHO guidelines?

## **2.6 Hypothesis**

Null hypothesis: There is no difference in the establishment of breastfeeding within 1 hour of delivery at KNH in single women compared to married women

Alternate hypothesis: There is a significant difference in the establishment of breastfeeding within 1 hour of delivery at KNH in married women as compared to single women.

## **2.7 Objectives**

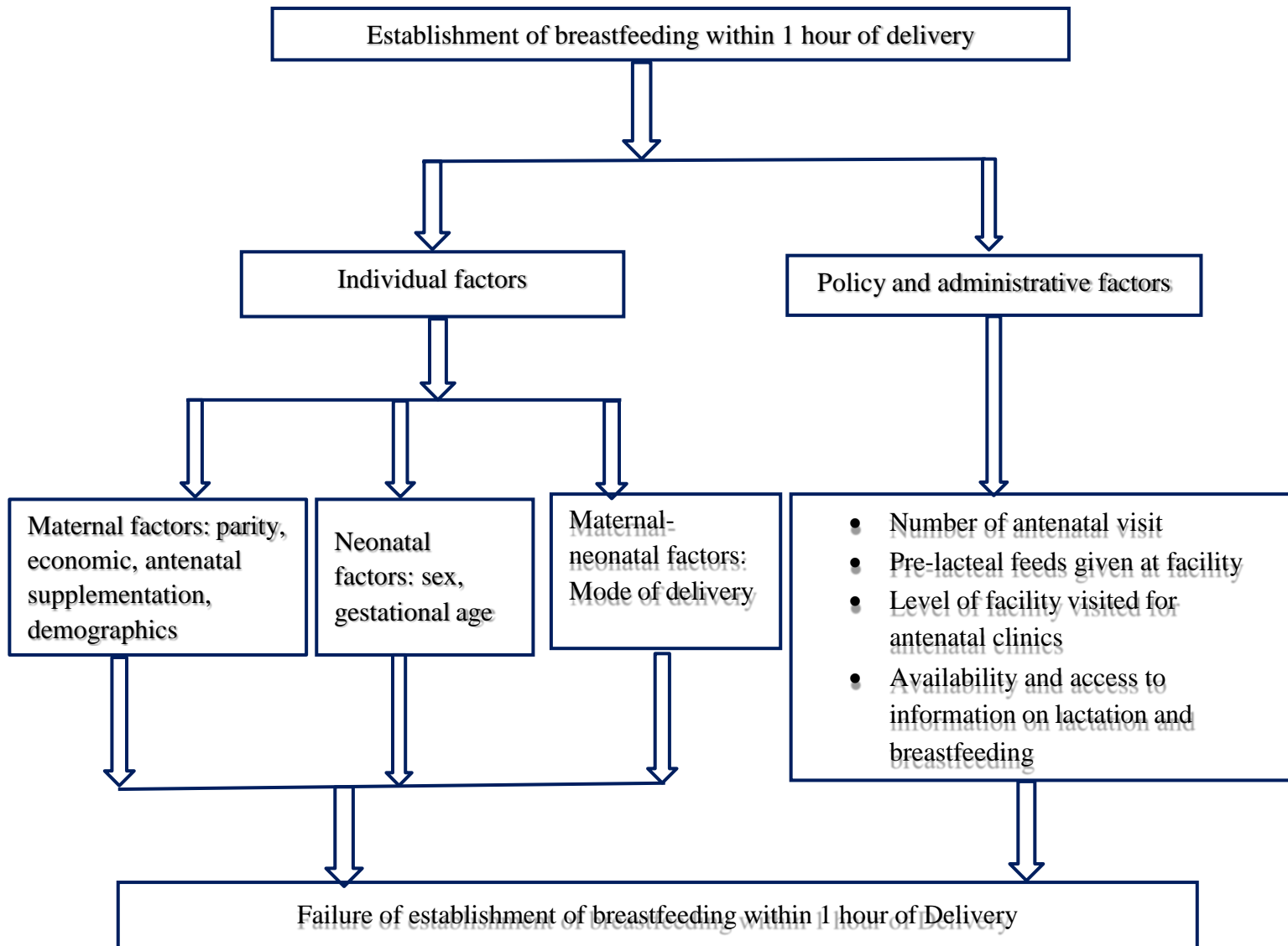
### **2.7.1 Broad Objectives**

To determine the factors associated with the establishment of breastfeeding within 1 hour of delivery at KNH

### **2.7.2 Specific objectives**

- i) To determine factors associated with breastfeeding establishment at 1hour at KNH.
- ii) To determine the proportion of mothers able to achieve good LATCH within 1 hour of delivery at KNH

## 2.8 Conceptual framework



## CHAPTER THREE

### 3. METHODOLOGY

#### 3.1 Study design

This was a facility-based cross-sectional study among women post-delivery in Kenyatta National Hospital. This study design will capture the characteristics of the women, delivery information, and breastfeeding status within 1 hour of delivery.

#### 3.2 Study location

The study was conducted in Kenyatta National Hospital labour and post-natal wards. KNH is the largest referral hospital in Kenya and is located in Nairobi. It serves as a teaching hospital to many institutions including the University of Nairobi's College of Health Sciences and other training institutions. The delivery unit runs throughout the week for 24 hours and serves mainly referrals. An average of 1200 deliveries per month are conducted in the unit.

The study location was ideal as:

- It is the largest referral facility in the country and thus receives referrals of a large number of patients with diverse socio-economic backgrounds
- There exists a pool of specialists in various fields capable of management of complications: obstetricians, paediatricians, neonatologists, pathologists, haematologists, nutritionists among others
- The hospital has a new-born unit that has a capacity of 70 beds, and a NICU with a capacity of 6 beds for management of sick babies.
- The site is easily accessible within the capital city of Kenya.

Factors that limit the suitability of the site:

- Being a large referral hospital, the findings may not represent the statistics of all hospitals in the country

#### 3.3 Study population

The study population comprised of women delivering in Kenyatta National Hospital at thirty-four (34) weeks and above gestation. The gestational age was determined and calculated from the last normal menstrual period, for those women with regular cycles or a first-trimester ultrasound dating.

### 3.4 Eligibility criteria

#### 3.4.1 Inclusion criteria

- Women admitted in labour ward during labour and delivered within the facility
- Women who delivered via caesarean section and vaginal births including assisted vaginal delivery.
- Those with live births 34 weeks gestation or above and birthweight 1.8kg and above
- Women aged between 18-49 years of age
- Those consenting to participate

#### 3.4.2 Exclusion criteria

- Those who delivered before arrival in the facility
- Those discharged before the lapse of 24 hours
- Severe birth asphyxia affecting the neonate's ability to suckle
- Congenital anomalies that may interfere with breastfeeding (cleft palate, oral malformations)
- NBU admissions for sickly neonates
- Severe chronic diseases affecting the mother including mental illness
- If there is a risk of infectious transmissible disease

### 3.5 Sample size determination

This was a facility-based cross-sectional study. The required sample size (n) was calculated using the single population proportion formula (16,17) with the following assumptions:

- Level of confidence = 95%,
  - $Z_{\alpha/2}$  is the critical value of the Normal distribution at  $\alpha/2$
  - For a confidence level of 95%, the critical value = 1.96.
- Type I error ( $\alpha$ ) = 0.05
- 5% margin of error (d)

Based on the 58.7% previous prevalence estimates of EIBF within one hour reported by Takahashi et al. (4).

$$n = \frac{(Z_{\alpha/2})^2 P(1 - P)}{d^2}$$
$$n = \frac{(1.96)^2 \times 0.587(1 - 0.587)}{0.05^2}$$

$$n = 93.13 \approx 94 \text{ (sample size estimate rounded up)}$$

Given a 15% non-response rate, the final sample size was 108.

### 3.6 Sampling procedure

The participants were recruited after triage at labour ward. Those in active phases of labour at 6cm cervical dilation and above were informed on the objectives and significance of the study. Those women meeting the inclusion criteria and giving consent were enrolled consecutively into the study. A random sampling procedure was applied to select the study participants from those women who delivered in the KNH labour ward or theatre until the desired sample size is achieved.

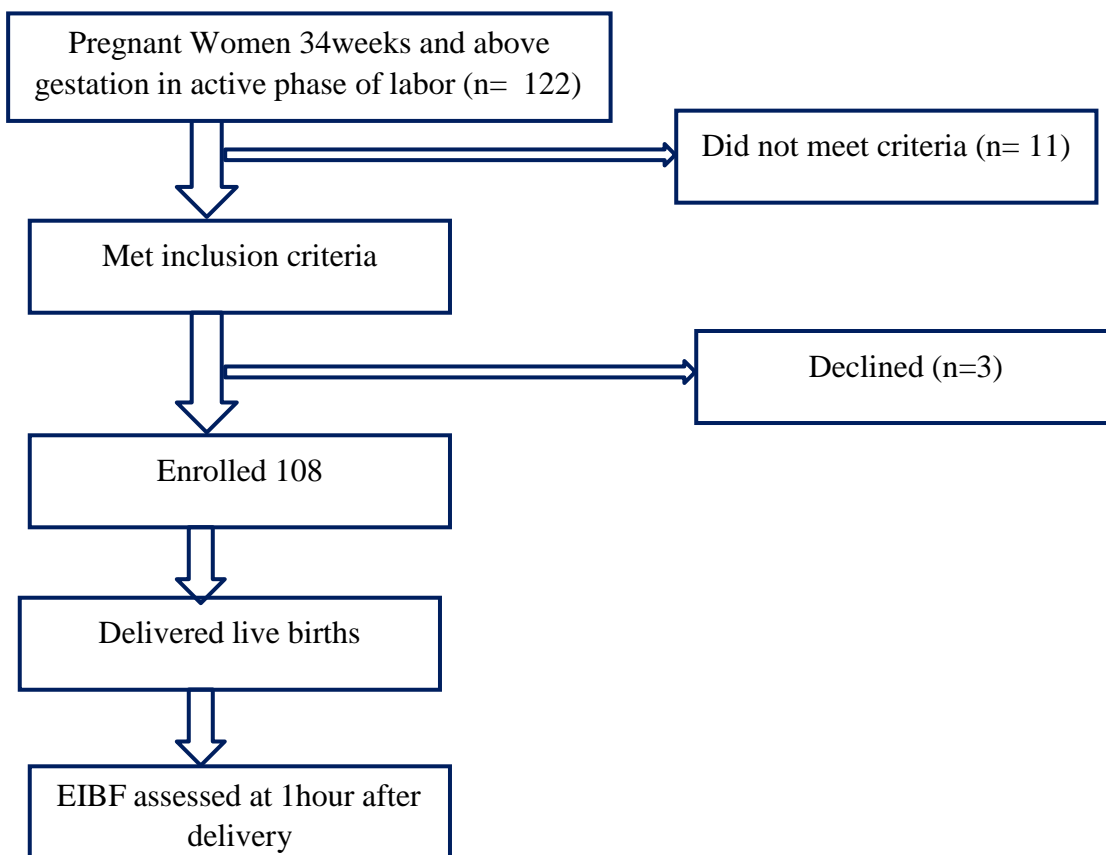


Figure 1. Study flow chart

### 3.7 Data variables

- Socioeconomic status (income above SHS. 30000 vs below)
- Occupation (formal employment vs informal)
- Age of mother (20-35 vs above 35 vs below 20)
- Religious aspect (Christian vs Islam vs other)
- Parity (prim gravida vs multigravida)
- Mode of delivery vaginal vs caesarean



- Sex of neonate
- Antenatal visits (8 visits minimum vs below 8 as per WHO guidelines 2016)
- Information access to breastfeeding from a medical professional
- Family structure (single vs married)
- ANC Supplements (taken vs NOT taken)
- Cultural beliefs (negative vs promotive)
- Prolactal feeds (given vs not given)
- Gestational age late preterm, term, and post-term
- History of pregnancy loss/miscarriage
- Mothers perception of the adequacy of milk production
- Induction of labour

### **3.8 Data collection and management methods**

Structured interviewer-administered questionnaires were used to collect demographic, pregnancy, and delivery data. The questionnaires were designed to contain both standardized closed and open-ended questions. The principal investigator and research assistants administered the questionnaires. Informed consent was administered to the women who met the inclusion criteria of the study. Those consenting were enrolled then interviewed. Enrolment was voluntary and participants were allowed to withdraw at any time with no consequences. Clinical information was extracted from patient files. The LATCH assessment tool was administered after delivery at 1 hour, by the research assistants and principal investigator who assessed if breastfeeding has been established by scoring them, as per the tool. A score of 5 and above was scored as a successful establishment.

A daily log of patient numbers including inpatient and study numbers assigned to each mother enrolled was kept. Any missing or unclear response to the questions was corrected by requesting the mother for additional time to clarify the responses. Data records were kept in a secure location.

### **3.9 Ethical consideration**

Ethical approval was sought from Kenyatta National Hospital/ University of Nairobi Ethics and Review Committee and Hospital Administration upon approval granted by the University of Nairobi Department of Obstetrics and Gynaecology. Informed consent was sought from each respondent and confidentiality ensured at all stages of the study. Each respondent was assigned a unique code identifier to provide for confidentiality. Hospital pain management

protocols and surgeons's post-op instructions were followed by the primary caregivers without interference from the research team, any participant opting out of the study due to pain or other reason were allowed as per the consent form.

### **3.10 Benefits of the study**

- The quality of breastfeeding was assessed with the tool and problem areas identified through categories of the LATCH tool.
- Mothers at high risk of lactation failure can be identified and appropriate support offered to them
- The results of this study will be shared with the hospital management and relevant changes to achieve.

### **3.11 Data analysis methods**

The questionnaires were coded and entered into an Excel spreadsheet and imported into R version 4.0.2 statistical software. Data cleaning was done before running the data analysis and stored in a password protected hard drive, limited access computer. The study population was described by summarizing the socio-demographic and clinical variables into percentages and means/medians for categorical and continuous data respectively. Multivariate logistic regression was used to check possible confounders to the association between successful breastfeeding and maternal and neonatal factors.

Data were presented using tables. Statistical significance was set at 5% (p-value of < 0.05). The prevalence of establishment of breastfeeding within one hour was analyzed and presented using proportions at a 95% confidence interval.

### **3.12 Study results Dissemination and Closure**

The results of the study will be presented to the department of obstetrics and gynaecology and later published into a thesis for filing in the University of Nairobi Library services. The findings will then be summarized into papers and sent out to maternal /neonatal health journals for publishing and wider dissemination. The findings will also be presented at conferences and continuous medical education (CME) events.

## CHAPTER FOUR

### 4. RESULTS

#### 4.1 Maternal and newborn characteristics

One hundred and eight mother-infant dyads participated in this study. The means and standard deviation (SD) of the age of the participating women were  $26.57 \pm 5.79$  (range: 18–51) years. In terms of marital status, 63.9% (n = 69) were married, 33.3% (n = 36) were single, 0.9% (n=1) was divorced, 1.9% (n=2) were widowed. Eighteen mothers, 16.7%, had primary education, 51.9% (n = 56) secondary education, and 31.5% (n = 34) had post-secondary education. About 68% (n = 72) of the mothers were unemployed. Five in every ten (50.9%; n = 55) mothers reported having childbirth for the first time (primiparous) and almost the same percentage (49.1%) of the mothers had given birth more than once (multiparous).

Prelacteal feeds were given to all the mothers and none had negative cultural beliefs. And almost all the mothers (99.1%) had a positive perception of the adequacy of milk production (not shown in Table 2). Most of the mothers had below 8 antenatal visits (91.7%; n=99). Childbirth occurred mostly at term 37 to 41+3 weeks, as presented in Table 2, in which the maternal and newborn characteristics of the study participants are described.

Table 2. Maternal and newborn characteristics, Kenyatta National Hospital, Nairobi

Characteristics	Total <sup>1</sup> (n = 108)
	Frequency, n (%)
- Maternal age (n= 108)	
• <25	46 (42.6)
• 25–29	30 (27.8)
• 30–34	21 (19.4)
• $\geq 35$	11 (10.2)
• Mean $\pm$ SD <sup>2</sup>	$26.57 \pm 5.79$
- Marital status (n= 108)	
• Married	69 (63.9)
• Single	36 (33.3)
• Divorced	1 (0.9)
• Widowed	2 (1.9)
- Maternal education level (n= 108)	
• Primary school	18 (16.7)
• Secondary school	56 (51.9)
• Post-secondary	34 (31.5)

<sup>1</sup> Numbers may not sum to group totals or percentages may not total 100% where data for the variable are missing

<sup>2</sup> Data expressed with a plus/minus sign were mean  $\pm$  standard deviation (SD).

Table 2. Maternal and newborn characteristics, Kenyatta National Hospital, Nairobi

Characteristics	Total <sup>1</sup> (n = 108)
	Frequency, n (%)
- Maternal occupation (n= 106)	
• Non employed	72 (67.9)
• Casual work	13 (12.3)
• Self-employed	9 (8.5)
• Salaried job	12 (11.3)
- Income status (n= 30)	
• <10,000	10 (33.3)
• 10,000 - 19,000	10 (33.3)
• 20,000 - 29,000	3 (10.0)
• 30,000 - 39,000	1 (3.3)
• 40,000+	6 (20.0)
- Religion (n= 107)	
• Catholic	32 (29.9)
• Muslim	4 (3.7)
• Protestant	71 (66.4)
- Parity (n= 108)	
• Primipara	55 (50.9)
• Multipara	53 (49.1)
- Number of antenatal visits (n=108)	
• < 8	99 (91.7)
• > 8	9 (8.3)
- Sex of neonates	
• Male	41 (38.0)
• Female	67 (62.0)
- Gestational age	
• Late preterm 34+0 to 36+6 weeks	8 (7.4)
• Term 37 to 41+3 weeks	85 (78.7)
• Post-term 41+4 and above	15 (13.9)

A previous history of pregnancy loss or miscarriage was reported by 17.6% (n = 19) and 59.8% (n=64) had access to information on breastfeeding from a professional (Figure 3).

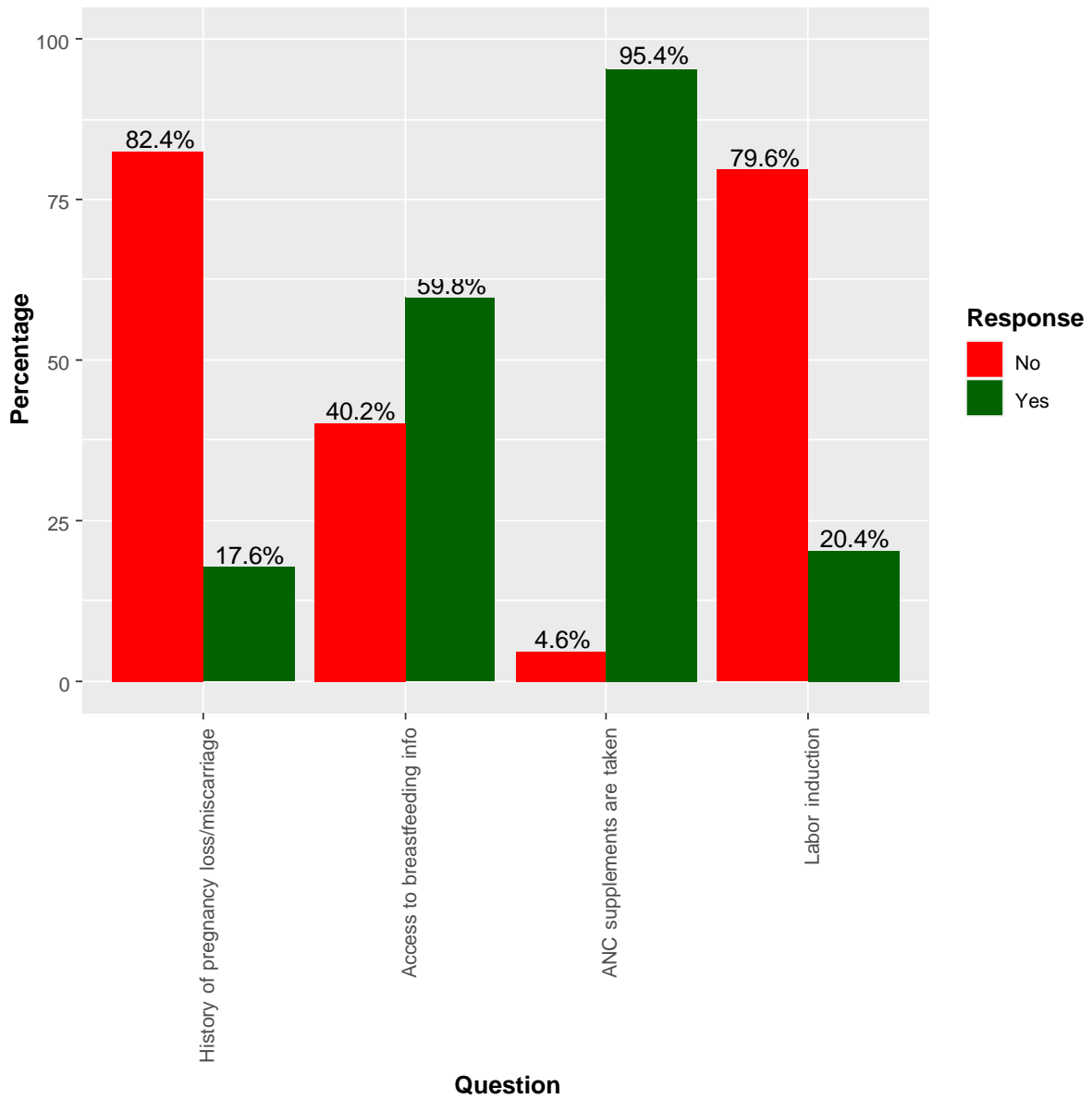


Figure 2. Bar plot of maternal and obstetric factors

Of the 108 mothers, 63 (58.3%) had a spontaneous vaginal delivery (SVD) while the remaining 45 (41.7%) had per Caesarean section as shown in Figure 4 below.

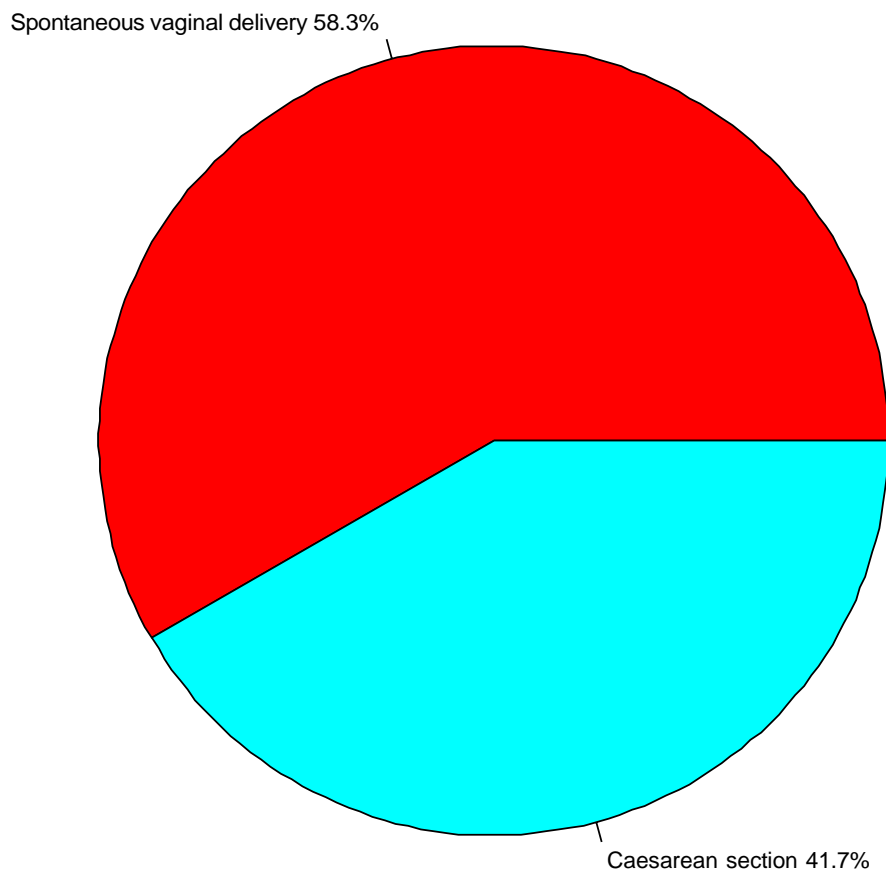


Figure 3. Pie chart of the mode of delivery

#### **4.2 The proportion of mothers able to achieve good LATCH within one hour of delivery at Kenyatta National Hospital**

Of the 108 mother-infant pairs, 58.3% (n=63) achieved good LATCH within one hour of childbirth. On the latch item, 39.8% of the infants were too sleepy or reluctant, did not achieve latch. A similar proportion (39.8%) had no audible swallowing. Most of the mothers had everted type of nipple after stimulation (62.0%) while on the comfort scale, 99.1% (n=107) had soft, tender, intact nipples. On Hold, 50.9% (n=55) of the mothers had no assistance from staff and were able to position and hold the infant. The details regarding the proportion of mothers able to achieve successful breastfeeding within one hour of delivery overall and stratified by marital status are given in Table 3.

Table 3. The success of breastfeeding within one hour of delivery at Kenyatta National Hospital with the entire group and subgroups of single women and married women

Item	Score <sup>3</sup>	Total (n=108)	Single (n = 36)	Married (n = 69)	p-value <sup>4</sup>
		n (%)	n (%)	n (%)	
Latch	• (0) Too sleepy or reluctant, not latch achieved	43 (39.8)	17 (47.2)	25 (36.2)	0.389
	• (1) Repeated attempts, must hold nipple in mouth, must stimulate to suck	26 (24.1)	6 (16.7)	19 (27.5)	
	• (2) Grasps breast, tongue down and forward, lips flanged, Rhythmic suckling	39 (36.1)	13 (36.1)	25 (36.2)	
Audible swallowing	• (0) None	43 (39.8)	17 (47.2)	25 (36.2)	0.409
	• (1) A few with stimulation	36 (33.3)	12 (33.3)	23 (33.3)	
	• (2) Spontaneous and intermittent	29 (26.9)	7 (19.4)	21 (30.4)	
Type of nipple	• (0) Inverted	5 (4.6)	4 (11.1)	1 ( 1.4)	0.107
	• (1) Flat	36 (33.3)	11 (30.6)	25 (36.2)	
	• (2) Everted after stimulation	67 (62.0)	21 (58.3)	43 (62.3)	
Comfort	• (0) Engorged, cracked, bleeding, large blister, severe discomfort.	1 (0.9)	1 (2.8%)	0 (0.0)	0.343
	• (1) Filling, Reddened, small blister or bruises, mild/moderate discomfort	0 (0.0)	0 (0.0)	0 (0.0)	
	• (2) Soft, tender, intact nipple	107 (99.1)	35 (97.2)	69 (100.0)	
Hold	• (0) Full assist (staffs holds the baby at breast)	25 (23.1)	13 (36.1)	11 (15.9)	0.057
	• (1) Minimal assist, Teach one side mother - does other, Staff holds and then mother take over	28 (25.9)	9 (25.0)	19 (27.5)	
	• (2) No assist from staff, mother able to position and hold the infant	55 (50.9)	14 (38.9)	39 (56.5)	
Total score	• $\geq 5$ (Successful breastfeeding)	63 (58.3)	17 (47.2)	44 (63.8)	0.155
	• $< 5$ (Unsuccessful breastfeeding)	45 (41.7)	19 (52.8)	25 (36.2)	

<sup>3</sup> LATCH scale (14,40) was used in assessing breastfeeding success after one hour of childbirth.

<sup>4</sup> Chi square ( $\chi^2$ ) test or Fisher's exact test *p*-value was used for comparison of LATCH scale items in single and married women appropriately

#### 4.2.1 Testing differences in proportions in the establishment of breastfeeding within one hour of delivery among single and married women

This study also hypothesized that there is a significant difference in the establishment of breastfeeding within one hour of delivery at KNH in married women as compared to single women. The analyses find that 47.2% (n=17) versus 63.8% (n=44) of the neonates whose mothers were single or married achieved successful breastfeeding (LATCH) within one hour, respectively; however, this difference was not statistically significant ( $\chi^2 = 2.0241$ ,  $p$ -value = 0.1548). Although there seems to be a slight improvement, being married did not bring about an objective improvement in establishing breastfeeding within one hour of delivery.

There were also no statistically significant differences across all the LATCH scoring items ( $p$ -value > 0.05) implying that frequencies in each of the LATCH items—Latch, Audible swallowing, nipple Type, Comfort, Hold score, were proportionately the same in single women as they are in married women (Table 3). Therefore, at the conventionally significant level of 5%, or 0.05, there was no statistically significant evidence to reject the null hypothesis ( $H_0$ ) of no difference. Hence the  $H_0$  is not disproved.

#### 4.3 Factors associated with the establishment of breastfeeding within one hour of delivery at Kenyatta National Hospital

##### 4.3.1 Bivariate analyses

Table 4 below summarizes the chi-squared test for trend in proportions for the LATCH scores. Testing whether there is a linear increase/decrease in the proportion of mother-infant dyads with successful initiation of breastfeeding with one hour moving up/down in item score categories (0,1,2 or 2,1,0). For the SVD group, there is a statistically significant linear increase in the proportion of successful initiation of breastfeeding within one hour (yes) as the item score increases, for all the items.

Table 4. The success of EIBF at Kenyatta National Hospital with the SVD group

Item	Score	Successful breastfeeding		
		No	Yes	<i>p</i> -value
Latch	(0) Too sleepy or reluctant, no latch achieved	15 (100.0)	0 (0.0)	<0.001
	(1) Repeated attempts, must hold nipple in mouth, must stimulate to suck	0 (0.0)	18 (37.5)	
	(2) Grasps breast, tongue down and forward, lips flanged, Rhythmic suckling	0 (0.0)	30 (62.5)	
Audible swallowing	(0) None	13 (86.7)	0 (0.0)	<0.001
	(1) A few with stimulation	2 (13.3)	26 (54.2)	
	(2) Spontaneous and intermittent	0 (0.0)	22 (45.8)	



Type of nipple	(0) Inverted	1 (6.7)	0 (0.0)	<b>&lt;0.001</b>
	(1) Flat	9 (60.0)	10 (20.8)	
	(2) Everted after stimulation	5 (33.3)	38 (79.2)	
Comfort	• (0) Engorged, cracked, bleeding, large blister, severe discomfort.	–	–	<b>&lt;0.001</b>
	• (1) Filling, Reddened, small blister or bruises, mild/moderate discomfort	–	–	
	• (2) Soft, tender, intact nipple	15 (100.0)	48 (100.0)	
Hold	(0) Full assist (staffs holds the baby at breast)	8 (53.3)	1 (2.1)	<b>&lt;0.001</b>
	(1) Minimal assist, Teach one side mother-does other, Staff holds and then mother take over	7 (46.7)	8 (16.7)	
	(2) No assist from staff, mother able to position and hold the infant	15 (0.0)	48 (81.2)	

Unlike the SVD group, the CS group had significant linear trend in the proportion of mother-infant dyads with successful initiation of breastfeeding within one hour across Latch, Audible swallowing and Hold item score categories ( $p < 0.001$ ). Type of nipple and Comfort items appeared to show no linear increase in the proportion of mother-infant dyads with successful initiation of breastfeeding within one hour with increase in the item score ( $p < 0.05$ ) as shown in Table 5.

Table 5. The success of EIBF at Kenyatta National Hospital with the CS group

Item	Score	Successful breastfeeding		
		No	Yes	<i>p</i> -value
Latch	(0) Too sleepy or reluctant, no latch achieved	28 (93.3)	0 (0.0)	<b>&lt;0.001</b>
	(1) Repeated attempts, must hold nipple in mouth, must stimulate to suck	2 (6.7)	6 (40.0)	
	(2) Grasps breast, tongue down and forward, lips flanged, Rhythmic suckling	0 (0.0)	9 (60.0)	
Audible swallowing	(0) None	30 (100.0)	0 (0.0)	<b>&lt;0.001</b>
	(1) A few with stimulation	0 (0.0)	8 (53.3)	
	(2) Spontaneous and intermittent	0 (0.0)	7 (46.7)	
Type of nipple	(0) Inverted	4 (13.3)	0 (0.0)	<b>0.8715</b>
	(1) Flat	15 (50.0)	2 (13.3)	
	(2) Everted after stimulation	11 (36.7)	13 (86.7)	
Comfort	(0) Engorged, cracked, bleeding, large blister, severe discomfort	0 (0.0)	1 (6.7)	0.1527
	(1) Filling, Reddened, small blister or bruises, mild/moderate discomfort	–	–	
	(2) Soft, tender, intact nipple	30 (100.0)	14 (93.3)	
Hold	(0) Full assist (staffs holds the baby at breast)	16 (53.3)	0 (0.0)	<b>&lt;0.001</b>
	(1) Minimal assist, Teach one side mother-does other, Staff holds and then mother take over	13 (43.3)	0 (0.0)	
	(2) No assist from staff, mother able to position	1 (3.3)	15 (100.0)	

Item	Score	Successful breastfeeding		
		No	Yes	<i>p</i> -value
	and hold the infant			

Table 6 summarizes the results of crude (unadjusted) and adjusted odds ratios from the univariate and stepwise multivariable logistic regression model, respectively, for the establishment of breastfeeding within one hour of childbirth. In the unadjusted model, having a salaried job [crude/unadjusted odds ratio (cOR): 0.21, 95% confidence interval (CI): 0.05–0.91; *p*-value = 0.029) compared to being unemployed was associated with lower odds of the establishment of breastfeeding. Childbirth by spontaneous vaginal delivery (cOR: 6.4, 95% CI: 2.73–15.01, *p*-value<0.001), access to information on breastfeeding from a professional (cOR: 3.29, 95% CI: 1.44–7.51, *p*-value = 0.004) and induction of labor (cOR: 2.96, 95% CI: 0.99–8.81, *p*-value =0.0499) were associated with higher odds of establishing breastfeeding within one hour.

#### 4.3.2 Multivariate analyses

After controlling for maternal age as a potential confounder, the odds of establishing breastfeeding within one hour of childbirth was again found lower if mother had a salaried job than being unemployed [adjusted odds ratio (aOR): 0.07, 95% CI: 0.01–0.89, *p*-value = 0.027] (Table 6). In terms of maternal-neonatal factors, infants who were born by spontaneous vaginal delivery (SVD) had seven-fold higher odds of establishing breastfeeding within one hour than those who had a caesarean section (aOR: 7.14, 95% CI: 2.33–21.9; *p*-value < 0.001). Therefore, SVD was a strong predictor for breastfeeding within one hour.

Neonatal factors such as sex and gestational age; and maternal factors such as parity, antenatal supplementation, maternal education, religion had no statistically significant predictive relationship with breastfeeding with one hour in the adjusted logistic regression model at the conventional 5% level. Additionally, policy and administrative factors that included the number of antenatal visits, pre-lacteal feeds given at facility, availability, and access to information on lactation and breastfeeding were also not statistically significant in the multivariable logistic regression model.

Table 6. Crude (unadjusted) and adjusted odds ratios of factors associated with breastfeeding establishment within one hour at Kenyatta National Hospital, Nairobi Kenya

Factors	Success n <sup>5</sup> (%)	Crude Odds Ratio (95% CI <sup>6</sup> )	<i>p</i> -value	Adjusted Odds <sup>7</sup> Ratio (95% CI)	<i>p</i> -value
<b>Maternal age (in years)</b>					
< 25	27 (58.7)	1.00		1.00	
25–29	17 (56.7)	0.92 (0.35, 2.44)	0.861	0.56 (0.13, 2.36)	0.376
30–34	12 (57.1)	0.94 (0.32, 2.79)	0.905	1.32 (0.17, 10.1)	0.749
≥35	7 (63.6)	1.23 (0.28, 5.48)	0.764	2.9 (0.25, 33.7)	0.331
<b>Maternal occupation</b>					
Non employed	44 (61.1)	1.00		1.00	
Casual work	11 (84.6)	3.5 (0.7, 17.6)	0.120	1.56 (0.22, 10.8)	0.656
Self-employed	4 (44.4)	0.51 (0.12, 2.25)	0.344	0.2 (0.01, 4.93)	0.240
Salaried job	3 (25.0)	0.21 (0.05, 0.91)	0.029*	0.07 (0.01, 0.89)	0.027*
<b>Parity</b>					
Multipara	32 (60.4)	1.00		1.00	
Primipara	31 (56.4)	0.85 (0.4, 1.78)	0.672	0.39 (0.11, 1.35)	0.153
<b>History of pregnancy loss/miscarriage</b>					
No	55 (61.8)	1.00		1.00	
Yes	8 (42.1)	0.45 (0.16, 1.3)	0.119	0.44 (0.09, 2.21)	0.240
<b>Mode of delivery</b>					
Caesarean section	15 (33.3)	1.00		1.00	
Spontaneous vaginal delivery	48 (76.2)	6.4 (2.73, 15.01)	<0.001* **	7.14 (2.33, 21.9)	<0.001***
<b>Information access to breastfeeding from professional</b>					
No	18 (41.9)	1.00		1.00	
Yes	45 (70.3)	3.29 (1.44, 7.51)	0.004**	1.81 (0.59, 5.57)	0.262
<b>Induction of labor performed</b>					

<sup>5</sup> n = total number of mother-infant dyads who experience breastfeeding within one hour

<sup>6</sup> CI = Confidence Interval and *p*-values are from Logistic regression model; \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < .001; Variables excluded during stepwise regression: religion, maternal education, number of antenatal visit, sex of neonates, ANC supplements taken, gestational age.

<sup>7</sup> *p*-value = 0.25 was used as a threshold for a covariate to both enter and exit the final model.

Table 6. Crude (unadjusted) and adjusted odds ratios of factors associated with breastfeeding establishment within one hour at Kenyatta National Hospital, Nairobi Kenya

Factors	Success n <sup>5</sup> (%)	Crude Odds Ratio (95% CI <sup>6</sup> )	p-value	Adjusted Odds <sup>7</sup> Ratio (95% CI)	p-value
No	46 (53.5)	1.00		1.00	
Yes	17 (77.3)	2.96 (0.99, 8.81)	0.0499*	2.09 (0.66, 6.64)	0.273

Given that this study found that mode of childbirth was clearly associated with establishing breastfeeding within one hour, sensitivity analyses were done with SVD and CS groups separately to account for confounding by delivery method. Table 7 below shows that in all the items (Latch, Audible swallowing, Type of nipple, Comfort, and Hold), there was no statistically significant association ( $p > 0.05$ ) between breastfeeding establishment within one hour and a number of factor for spontaneous vaginal delivery.

Table 7. Crude (unadjusted) and adjusted odds ratios of factors associated with breastfeeding establishment within one hour for spontaneous vaginal delivery group at Kenyatta National Hospital, Nairobi Kenya, (n = 63)

Factors	Levels	Successful breastfeeding		Crude Odds Ratio (95% CI <sup>8</sup> , p-value)	Adjusted Odds <sup>9</sup> Ratio (95% CI, p-value)
		No	Yes		
Age group	<25	8 (25.8)	23 (74.2)	-	-
	25–29	2 (11.8)	15 (88.2)	2.61 (0.56-18.9, p=0.263)	0.86 (0.13-7.79, p=0.882)
	30–34	3 (27.3)	8 (72.7)	0.93 (0.21-5.01, p=0.924)	0.56 (0.05-7.10, p=0.635)
	35+	2 (50.0)	2 (50.0)	0.35 (0.04-3.29, p=0.329)	0.42 (0.00-42.7, p=0.702)
Maternal occupation	Casual work	1 (9.1)	10 (90.9)	-	-
	Salaried job	3 (60.0)	2 (40.0)	0.07 (0.00-0.81, p=0.051)	0.09 (0.00-2.98, p=0.203)
	Self-employed	2 (66.7)	1 (33.3)	0.05 (0.00-0.93, p=0.063)	0.17 (0.00-14.7, p=0.453)
	Unemployed	9 (20.9)	34 (79.1)	0.38 (0.02-2.39, p=0.382)	0.76 (0.03-8.21, p=0.836)
Parity	Multipara	5 (20.8)	19 (79.2)	-	-
	Primipara	10 (25.6)	29 (74.4)	0.76 (0.21-2.51, p=0.664)	0.34 (0.03-2.78, p=0.356)
History of pregnancy loss	No	12 (21.8)	43 (78.2)	-	-

<sup>8</sup> CI = Confidence Interval and p-values are from Logistic regression model; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < .001$ ; Variables excluded during stepwise regression: religion, maternal education, number of antenatal visit, sex of neonates, ANC supplements taken, gestational age.

<sup>9</sup> p-value = 0.25 was used as a threshold for a covariate to both enter and exit the final model.

Table 7. Crude (unadjusted) and adjusted odds ratios of factors associated with breastfeeding establishment within one hour for spontaneous vaginal delivery group at Kenyatta National Hospital, Nairobi Kenya, (n = 63)

Factors	Levels	Successful breastfeeding		Crude Odds Ratio (95% CI <sup>8</sup> , p-value)	Adjusted Odds <sup>9</sup> Ratio
		No	Yes		
	Yes	3 (37.5)	5 (62.5)	0.47 (0.10-2.52, p=0.339)	0.22 (0.02-1.91, p=0.171)
Information access	No	6 (33.3)	12 (66.7)	-	-
	Yes	8 (18.2)	36 (81.8)	2.25 (0.63-7.86, p=0.201)	0.97 (0.17-4.87, p=0.970)
Labour induced	No	14 (30.4)	32 (69.6)	-	-
	Yes	1 (5.9)	16 (94.1)	7.00 (1.23-132.5, p=0.07)	6.03 (0.80-133.2, p=0.135)

In the unadjusted model, the sensitivity analyses with CS group showed that primiparae women were less likely (cOR = 0.18: 95% CI: 0.02-0.78, p=0.039) to establish breastfeeding within one hour compared with multiparae mothers. However, all the factors were not statistically significant in the multivariable-adjusted model (Table 8).

Table 8. Crude (unadjusted) and adjusted odds ratios of factors associated with breastfeeding establishment within one hour for caesarean section group (n = 45) at Kenyatta National Hospital, Nairobi Kenya

Factor	Levels	Successful breastfeeding		Crude Odds Ratio (95% CI <sup>10</sup> , p-value)	Adjusted Odds <sup>11</sup> Ratio (95% CI, p-value)
		No	Yes		
Age group	<25	11 (73.3)	4 (26.7)	-	-
	25–29	11 (84.6)	2 (15.4)	0.50 (0.06-3.13, p=0.473)	0.28 (0.02-3.11, p=0.314)
	30–34	6 (60.0)	4 (40.0)	1.83 (0.33-10.6, p=0.486)	2.25 (0.12-54.8, p=0.589)
	35+	2 (28.6)	5 (71.4)	6.87 (1.04-64.4, p=0.059)	6.91 (0.30-306.1, p=0.249)
Maternal occupation	Casual work	1 (50.0)	1 (50.0)	-	-
	Salaried job	6 (85.7)	1 (14.3)	0.17 (0.00-6.53, p=0.314)	0.07 (0.00-10.7, p=0.364)
	Self-employed	3 (50.0)	3 (50.0)	1.00 (0.03-34.4, p=1.000)	0.55 (0.00-103.9, p=0.832)
	Unemployed	19 (65.5)	10 (34.5)	0.53 (0.02-14.3, p=0.662)	1.08 (0.00-214.7, p=0.978)
Parity	Multipara	16 (55.2)	13 (44.8)	-	-
	Primipara	14 (87.5)	2 (12.5)	0.18 (0.02-0.78, p=0.039)	0.23 (0.02-2.11, p=0.217)

<sup>10</sup> CI = Confidence Interval and p-values are from Logistic regression model; \* p < 0.05; \*\* p < 0.01; \*\*\* p < .001; Variables excluded during stepwise regression: religion, maternal education, number of antenatal visit, sex of neonates, ANC supplements taken, gestational age.

<sup>11</sup> p-value = 0.25 was used as a threshold for a covariate to both enter and exit the final model.

Table 8. Crude (unadjusted) and adjusted odds ratios of factors associated with breastfeeding establishment within one hour for caesarean section group (n = 45) at Kenyatta National Hospital, Nairobi Kenya

<b>Factor</b>	<b>Levels</b>	<b>Successful breastfeeding</b>		<b>Crude Odds Ratio (95% CI<sup>10</sup>, p-value)</b>	<b>Adjusted Odds<sup>11</sup> Ratio</b>
History of pregnancy loss	No	22 (64.7)	12 (35.3)	-	-
	Yes	8 (72.7)	3 (27.3)	0.69 (0.13-2.90, p=0.625)	0.44 (0.03-4.22, p=0.507)
Information access	No	19 (76.0)	6 (24.0)	-	-
	Yes	11 (55.0)	9 (45.0)	2.59 (0.74-9.69, p=0.142)	1.66 (0.25-12.0, p=0.593)
Labour induced	No	26 (65.0)	14 (35.0)	-	-
	Yes	4 (80.0)	1 (20.0)	0.46 (0.02-3.53, p=0.511)	0.60 (0.01-9.18, p=0.736)

## CHAPTER FIVE

### 5. DISCUSSION AND CONCLUSION

#### 5.1 Discussion

Breastfeeding is recognized as a public health responsibility (18–21), and given this, early initiation of breastfeeding (EIBF) within one hour of childbirth is a crucial element of neonatal care, a convenient and cost-effective approach to reducing newborn mortality (22). The WHO and UNICEF vouch for EIBF, ideally within one hour after childbirth (23). The broad objective of this study was to determine the factors associated with the establishment of breastfeeding within one hour of delivery at KNH using a validated (LATCH) tool. s

Unlike Baya (12)'s study that reported that the major reason for delay establishment of breastfeeding was facility factors, for instance transfer of mothers to the wards, this study did not find facility-level factors to contribute to delay or lack of initiation of breastfeeding within one hour. Baya (12) also reported that a significant relationship between provision of prelacteal feeds and delay in initiating breastfeeding by the mothers at the study sites ( $p < 0.0001$ ), however, this study reports that prelacteal feeds were given to all the mothers.

More than half (58.3%) of the surveyed mother-infant dyads had EIBF within one hour in KNH, this proportion was quite low and portends that a relatively large population of mothers still do not practice EIBF away from the WHO advocacy that all mothers should practice EIBF within one hour of childbirth. This estimate compares well with a previous estimate of 58.7% in Kenya reported by Takahashi et al. (4) in a 2017 secondary analysis of the WHO Global Survey data. The reported proportion, however, compares with a 2018 secondary analysis of the WHO Global Survey data by Ekubay et al. (24) in Addis Ababa, Ethiopia who also found 58.3% of mothers had EIBF, Setegn et al. (25)'s 52.4% in southeast Ethiopia. Other comparable estimates include 51% found by Karim et al. (26) in Bangladeshi women and 48% in South Sudan (27).

The proportion of mother-infant dyads successfully initiating breastfeeding within one hour was higher than reported previously (25%) in KNH and Pumwani Maternity Hospital by Baya (12). This could be attributable to the fact Baya (12) utilised interviewer based observations to assess breastfeeding rather than a scoring system and vaginal deliveries were excluded from the study population.

The stated EIBF prevalence finding, however, is higher than that of Cozma-Petruț et al. (28) who found only 24.3% of mothers had EIBF a cross-sectional study carried in Romania 2019.

Additionally, the overall combined EIBF rate of 43% in the Economic Community of West African States is also lower. Potentially, the comparatively high proportion of mother-infant pairs practicing EIBF than other regions could be because of a slightly higher percentage of mothers who reported accessing breastfeeding (59.8%) in this study, since knowledge on breastfeeding also plays a part (29).

This study revealed that 39.8% of the mother-infant pairs had latch-on and audible swallowing problems, apiece. Almost all the mothers had soft, tender, intact nipples, however, about half (49.1%) required assistance on hold. Analyses showed that slightly more than half (50.9%) of the mothers were primiparae. The distribution of parity was however statistically proportionate but perhaps could explain the reported problems of –hold by parity. The multiparae were 55 (50.9%) while primiparae were 53 (49.1%).

Similarly, the distribution by successful EIBF was not significantly different in the two parity groups. Specifically, they were comparable with 32 (60.4%) in the multiparae group and 31 (56.4%) in the primiparae group. This finding is quite consistent with results got in a KNH study by Ojigo (9) who found that the multiparae made 54.8% of EIBF while primiparae made 45.2% with no significant statistical difference. However, Ojigo (9) did not use a LATCH scoring system. This finding –on hold– is consistent with a result from a previous qualitative study that reported that primiparae mothers feel the desire of breastfeeding, but experience difficulties and needs professional assistance from paediatric nurses (18).

Successful EIBF (LATCH) within one hour of birth was higher among married mothers compared to single mothers but was statistically indifferent in both groups of mothers implying no objective improvement in successful LATCH among married mothers. Previous studies have linked being married with an increased likelihood of establishing EIBF or breastfeeding in general (27,30–32) but this current study does not infer associations.

This study reports that maternal education is significantly associated with EIBF. Being a mother who had a salaried job was inversely associated with the EIBF/good LATCH. Obstetrics literature has got mixed results on the effect of maternal education on EIBF, nevertheless, the recognition that EIBF may influence exclusive breastfeeding (EBF) is well established. Tadesse et al. (33) in a 2019 community based comparative cross-sectional study on maternal occupation found that mothers who practiced EIBF were significantly associated with higher odds of EBF than those who did not. Yet, Tadesse et al. reported very low odds of EBF among employed mothers, and this underpins the importance of EIBF for policy.



Additionally, some studies report a statistically insignificant effect of unemployed mothers on EIBF (24,34) while others like Chen et al. (35), though China is a high-income country, report a significant positive association of employed mothers with EIBF in a 2019 cross-sectional study. Comparable to Chen et al. and unlike this current study as well, Dagher et al. (36) revealed the odds of EIBF were higher for mothers who hold professional jobs, however, the sample consisted of a different socio-demographics as this current study and utilised a prospective cohort design in 2016 (USA).

The delivery pattern affects EIBF. Given this, spontaneous vaginal delivery was a strong predictor for EIBF. Most of the mothers had spontaneous vaginal births (58.3%) and the mother-infant dyads were most likely to breastfeed within one hour of childbirth (seven-fold higher odds) EIBF than caesarean section counterparts. The finding agrees with Khanal et al. (37)'s community based prospective cohort study in Nepal that reported that mothers who had a caesarean mode of delivery had 39% lower odds of EIBF. Cakmak and Kuguoglu (38), using the LATCH charting system, also found statistically meaningful differences in EIBF between per vagina and cesarean section child deliveries. Similar findings have also been reported by Shiferaw et al. (34) and Mekonen et al. (39) who found three-fold and four-fold higher odds of EIBF, respectively, for vaginal delivery than a caesarean section.

## **5.2 Limitations to the study**

The results of this study are generalizable only to mother-infant dyads of similar demographics, that is, the nature of the sample and study site might restrict the generalizability of the study. The study location was an urban setup and the population may not be reflective of the rural population Kenya. Additionally, this was a facility based cross sectional study, and the results should be interpreted of in the context of KNH.

Given the study design, causal relationships between obstetric characteristics and EIBF could not be established, and left out variables such as duration of delivery, mother's health could have a confounding effect on the associations with EIBF and were not be accounted for in the analysis. Recall bias – recollections of some mothers may be less accurate and may have led to under-reporting or over-reporting.

## **5.3 Strength of the study**

Most studies interpret the question of EIBF within one hour as intent to breastfeed without actual evidence of EIBF, the use of LATCH scoring eliminated systematic differences that often occur as a result of reporting by postpartum mothers whether they practiced

breastfeeding or not and eliminated such possible biases. Importantly, this the first study of its kind using LATCH scoring in the Kenyan setup. Again, this study was conducted in the largest referral facility in the country and offering a somewhat diverse population. While the study did not report a significant difference in the proportion in the LATCH charting system between single and married mothers' categories, the calculated sample size presented an acceptable amount of type II error.

#### **5.4 Conclusion**

- Breastfeeding in the first hour after delivery seems good at 58.3% but was still below the WHO recommendation that all mothers should practice EIBF. Findings from this study offer insight into important factors related to establishment EIBF.
- The delivery pattern affected breastfeeding within one hour, and the protective factor to breastfeeding was spontaneous vaginal delivery rather than a caesarean section.
- The current study strengthens the value of the obstetricians to identify mothers at higher risk of delayed initiation of breastfeeding after childbirth. Since EIBF promotes EBF, the problem of EIBF risk such as per caesarian delivery still deserves the attention and concern of obstetrics staff and policymakers.
- A standardised assessment tool to determine breastfeeding establishment, as well as addressing the individual components of this scoring system that contribute successful LATCH may reduce low uptake of EIBF among post caesarean mothers.

#### **5.5 Recommendations**

- The inclusion of the LATCH tool in postpartum care will offer a standardized approach to breastfeeding assessment while identifying problem areas based on the categories.
- Per caesarean delivery, mothers require more obstetric support, mostly in holding and positioning their infants for EIBF within one hour. Consider initiation of breastfeeding in the theatre while in recovery for stable mothers.
- More studies on neonatal outcomes of women who fail to achieve good LATCH. Additionally, studies testing for the timing of initiation of EIBF in the caesarean-section group are needed.
- Specifically, this study requires replication to include diverse demographics of mothers not only in KNH but also in other health facilities countrywide.

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**APPENDICES**

**APPENDIX I: QUESTIONNAIRE**

**TITLE OF STUDY: FACTORS AFFECTING THE ESTABLISHMENT OF BREASTFEEDING WITHIN 1 HOUR OF DELIVERY AT KNH**

Date of interview 

		/			/				
dd			mm			yyyy			

Study number \_\_\_\_\_

**SOCIO DEMOGRAPHIC FACTORS**

Age \_\_\_\_\_ years

What is the highest level of education you have attained?

None  Primary  Secondary  Post-secondary

What is your current marital status?

Single  Married  Divorced/Separated  Widowed

What is your main source of income?

Salaried job  Self-employed  Casual work  Not employed

Income per month <10000  10000-19000  20000-29000

30000-39000  40000+

Religion: Catholic  Protestant  Muslim

Parity Primi  Multi

Mode of delivery SVD  CS

Antenatal visits 8 and above visits  below 8visits

Information access on breastfeeding from professional Yes  No

ANC supplements taken Yes  No

Negative cultural beliefs Yes  No

Prelacteal feeds given Yes  No

Sex of neonate Male  Female

Gestational age Late preterm 34+0 to 36+6 weeks  Term 37 to 41+3 weeks

Post dates 41+4 and above

Induction of labor performed Yes

No

Past history of pregnancy loss/miscarriage Yes

No

Mother's perception on

adequacy of milk production Positive

NegativeComments



**APPENDIX II: LACTATION ASSESSMENT TOOL**

	0	1	2	Score at 1 hour postpartum
Latch	Too sleepy or reluctant No latch achieved	Repeated attempts Hold nipple in mouth stimulate to suck	Grasps breast Tongue down Lips flanged Rhythmic sucking	
A audible swallow	None	A few with stimulation	Spontaneous and intermittent  <24 hours old  Spontaneous and frequent  >24 hours old	
T type of nipple	inverted	Flat	Everted (after stimulation)	
C- Comfort(breast/nipple)	Engorged Cracked, bleeding, large blisters, or bruises Severe discomfort	Filling Reddened/small blisters or bruises Mild/moderate discomfort	Soft  Tender	
H hold/positioning	Full assist (staff holds infant at breast)	Minimal assist (i.e., elevate head of bed; place pillows for support.)  Teach one side; mother does other  Staff holds and then mother takes over	No assist from staff  Mother able to position/hold infant	
Total score				

**APPENDIX III: CONSENT FORM – ENGLISH  
FACTORS AFFECTING THE ESTABLISHMENT OF BREASTFEEDING WITHIN 1  
HOUR OF DELIVERY AT KNH**

**Investigators**

Name	Institution	Department	Position
Dr Isaac Maingi Muchiri	University of Nairobi	Obstetrics and gynecology	Principal investigator
Professor E. Cheserem	University of Nairobi	Obstetrics and gynecology	Supervisor
Dr. A. Bosire	University of Nairobi	Obstetrics and gynecology	Supervisor

Emergency telephone number: 0721470317

Dr Isaac Maingi,

Principal investigator

Resident obstetrics and gynaecology .

University of Nairobi,

**INVESTIGATORS' STATEMENT:** The principal investigator is asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read this form carefully or listen as it is read to you. You may ask questions about what we will ask you to do, the risks, the benefits and your rights as a volunteer, or anything about the research or in this form that is not clear. When all your questions have been answered, you can decide if you want to be in this study or not. This process is called –informed consent. If you wish we will give you a copy of this form for your records. You are free to refuse to participate and to withdraw from the study at any time without penalty and you will continue to receive the expected standard of care.

**PURPOSE AND BENEFITS:** The aim of this study is to determine prevalence and associated factors in breastfeeding establishment within 1 hour of delivery. You will not have direct benefit from this study but the information generated will be important for the community in guiding decisions to support newly delivered mothers. You can take part in this study if you delivered your baby within the hospital.

**PROCEDURES:** This is what will happen if you decide to participate in this study. The investigator will ask several questions regarding you and your pregnancy and your baby. As you give responses to the questions, a questionnaire will be filled. No invasive procedures such as drawing of blood will be involved.

**RISKS, STRESS, OR DISCOMFORT:** You may become embarrassed, worried, or anxious because of some of the questions you will be asked. Participation in the study will require

you to commit your time. Completing the questions will take 10-15 minutes. However, we will try to serve you as quickly as possible.

REIMBURSEMENT: You will not receive any money for participating in this survey.

OTHER INFORMATION: We will keep your identity as a research subject confidential. Only the investigators and the University of Nairobi Ethics and Research Committee can have access to information about you. The information about you will be identified only by the study number and will not be linked to your name in any records. Although we will make every effort to keep your information confidential, no system for protecting your confidentiality can be completely secure. Therefore it is still possible that someone could find out that you were in this study and could find out information about you. To minimize the risk your name will not be used in any published reports about this study. You may withdraw from the study or refuse to answer any of the questions asked at any time without loss of benefit or penalty. If you have any questions regarding the study you can contact any of the investigators listed above. If you suffer any injuries or adverse effects due to participation in the study call the principal investigator on the emergency number shown above. You are free to refuse to participate in the study, if you decide not to participate in the study you will receive similar care to that provided to women participating in the study.

Signature of investigator \_\_\_\_\_ Date \_\_\_\_\_

Name of Investigator \_\_\_\_\_

Subject's statement:

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions about my rights as a research subject, I can call the University of Nairobi Ethics and research Committee at 2726300 Ext 44355. I will receive a copy of this consent form.

Signature of participant \_\_\_\_\_ Date \_\_\_\_\_

or

Left thumbprint of participant \_\_\_\_\_ Date \_\_\_\_\_

Name of participant \_\_\_\_\_

Signature of witness (If thumbprint used) \_\_\_\_\_

Name of Witness \_\_\_\_\_

University of Nairobi Ethics and Research Committee

Hospital Road off Ngong Road

P.O. Box 20723, Nairobi

Telephone 2726300

Secretary: Professor M. L. Chindia

Copies to: 1. Participant                      2. Investigator's file

**APPENDIX IV: CONSENT FORM – KISWAHILI  
FOMU YA RIDHAA YA KUSHIRIKI**

**MAMBO YANAYOATHIRI UANZISHWAJI WA UNYONYESHAJI NDANI YA SAA  
1 YA KUZAA KATIKA KNH**

Jina	Idara ya taasisi	Idara	Jukumu
Dr Isaac Maingi Muchiri	University of Nairobi	Obstetrics and gynecology	Principal investigator
Professor E. Cheserem	University of Nairobi	Obstetrics and gynecology	Supervisor
Dr. A. Bosire	University of Nairobi	Obstetrics and gynecology	Supervisor

Namba ya simu ya dharura: 0721470317

Dr Isaac Maingi Muchiri

Mchunguzi mkuu

Mkazi uzazi magonjwa na madaktari uzazi.

Chuo Kikuu cha Nairobi,

**TAARIFA ya WACHUNGUZI:** mchunguzi mkuu anakuuliza uwe katika utafiti wa utafiti. Madhumuni ya fomu hii ya kibali ni kukupa maelezo ambayo utahitaji kukusaidia kuamua kama ni katika utafiti au la. Tafadhali soma fomu hii kwa makini au Sikiliza kama imesomwa kwako. Unaweza kuuliza maswali kuhusu kile ambacho tutakuuliza kufanya, hatari, faida na haki zako kama kujitolea, au chochote kuhusu utafiti au katika fomu hii ambayo sio wazi. Wakati maswali yako yote yamejibiwa, unaweza kuamua kama unataka kuwa katika utafiti huu au la. Mchakato huu unaitwa "idhini ya taarifa". Ikiwa unataka kukupa nakala ya fomu hii kwa rekodi zako. Wewe ni huru kukataa kushiriki na kutoa mafunzo wakati wowote bila ya adhabu na utaendelea kupokea kiwango cha huduma iliyotarajiwa.

**MADHUMUNI na faida:** lengo la Utafiti huu ni kuamua kuenea na vipengele vinavyohusiana katika kuanzishwa kwa unyonyeshaji katika masaa 24 ya kuzaa. Huwezi kuwa na manufaa ya moja kutoka kwa utafiti huu lakini taarifa iliyotolewa itakuwa muhimu kwa jamii katika kuongoza maamuzi ya kusaidia akina mama wapya waliojiokoa. Unaweza kushiriki katika utafiti huu ikiwa umejiokoa mtoto wako ndani ya hospitali.

**TARATIBU:** hiki ndicho Kitakachotendeka ikiwa unaamua kushiriki katika utafiti huu. Mchunguzi atauliza maswali kadhaa kuhusu wewe na mimba yako na mtoto wako. Unapokupa majibu ya maswali, Dodoso litajazwa. Hakuna taratibu vamizi kama vile kuchora ya damu itajihusisha.

HATARI, MFADHAIKO, au uchovu: unaweza kuwa na aibu, wasiwasi, au wasiwasi kwa sababu ya baadhi ya maswali ambayo utaulizwa. Kushiriki katika utafiti itahitaji kufanya wakati wako. Kukamilisha maswali itachukua dakika 10-15. Hata hivyo, tutajaribu kuwatumikia haraka iwezekanavyo.

MAREJESHO: huwezi kupokea fedha yoyote kwa ajili ya kushiriki katika utafiti huu.

TAARIFA nyingine: tutaweka utambulisho wako kama somo la utafiti siri. Ni wachunguzi na kamati ya maadili ya Chuo Kikuu cha Nairobi na utafiti inaweza kuwa na upatikanaji wa taarifa kukuhusu. Maelezo kuhusu wewe utabainishwa tu na nambari ya utafiti na haitahusishwa na jina lako katika rekodi zozote. Ingawa itafanya kila juhudi kuweka maelezo yako kwa siri, hakuna mfumo wa kulinda usiri wako kunaweza kuwa salama kabisa. Kwa hiyo bado inawezekana kwamba mtu anaweza kujua kwamba ulikuwa katika utafiti huu na unaweza kupata maelezo kukuhusu. Ili kupunguza hatari ya jina lako haititumike katika taarifa zozote zilizochapishwa kuhusu utafiti huu. Unaweza kuondoa kutoka kwa utafiti au kukataa kujibu maswali yoyote yanayoulizwa wakati wowote bila kupoteza faida au adhabu. Kama una maswali yoyote kuhusu utafiti unaweza kuwasiliana na yoyote ya wachunguzi waliotajwa hapo juu. Kama unateseka kwa majeraha au madhara mabaya kutokana na kushiriki katika utafiti huita mchunguzi mkuu juu ya idadi ya dharura iliyoonyeshwa hapo juu. Wewe ni huru kukataa kushiriki katika utafiti, kama wewe kuamua si kushiriki katika utafiti wewe kupokea huduma sawa na kwamba zinazotolewa kwa wanawake kushiriki katika utafiti.

Sahihi ya mchunguzi \_\_\_\_\_ Tarehe \_\_\_\_\_

Jina la Investigator \_\_\_\_\_

Taarifa ya mada:

Utafiti huu umeelezewa kwangu. Mimi kujitolea kushiriki katika utafiti huu. Nimekuwa na nafasi ya kuuliza maswali. Ikiwa nina maswali kuhusu haki zangu kama somo la utafiti, ninaweza kuiita kamati ya maadili ya Chuo Kikuu cha Nairobi na utafiti katika 2726300 atini 44355. Nitapokea nakala ya fomu hii ya kibali.

Sahihi ya participant \_\_\_\_\_ Tarehe \_\_\_\_\_

Thumbprint kushoto wa mshiriki \_\_\_\_\_ Tarehe \_\_\_\_\_

Jina la mshiriki \_\_\_\_\_

Sahihi ya shahidi (kama thumbprint kutumika)

Jina la Shahidi \_\_\_\_\_

Kamati ya maadili ya Chuo Kikuu cha Nairobi na utafiti

Barabara ya hospitali kwenye barabara ya Ngong

S.L.P. Box 20723, Nairobi

Simu 2726300

Waziri: Profesa M. L. Chindia

Nakala za: 1. mshiriki 2. Faili ya mchunguzi



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10<sup>th</sup> June 2020

Dr. Isaac Maingi Muchiri  
Reg.No.H58/6804/2017  
Dept. of Obstetrics and Gynaecology  
School of Medicine  
College of Health Sciences  
University of Nairobi

Dear Dr. Muchiri

**RESEARCH PROPOSAL – FACTORS ASSOCIATED WITH THE INITIATION OF BREASTFEEDING WITHIN 1 HOUR OF DELIVERY AT KENYATTA NATIONAL HOSPITAL** (P154/03/2020)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 10<sup>th</sup> June 2020 – 9<sup>th</sup> June 2021.

This approval is subject to compliance with the following requirements:

- a. Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b. All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
- c. Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- d. Any changes, anticipated or otherwise that may increase the risks or affect 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.
- e. Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- f. 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*).
- g. Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

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For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Yours sincerely,



**PROF. M. L. CHINDIA**  
**SECRETARY, KNH-UoN ERC**

c.c. The Principal, College of Health Sciences, UoN  
The Director, CS, KNH  
The Chairperson, KNH- UoN ERC  
The Assistant Director, Health Information, KNH  
The Dean, School of Medicine, UoN  
The Chair, Dept. of Obstetrics and Gynaecology, UoN  
Supervisors: Prof. Eunice Cheserem, Dept. of Obstetrics and Gynaecology, UoN  
Dr. Alex Bosire, Dept. of Obstetrics and Gynaecology, UoN

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