

BREASTFEEDING PRACTICES AMONG
ADOLESCENT MOTHERS AND OLDER
PRIMIPAROUS MOTHERS, DURING THE
FIRST 14 WEEKS AFTER DELIVERY IN
DAGORETTI DISTRICT.

*A DISSERTATION PRESENTED IN PART FULFILLMENT OF
MASTERS OF MEDICINE (MMED) DEGREE IN PAEDIATRICS
AND CHILD HEALTH, UNIVERSITY OF NAIROBI*

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Declaration

This dissertation is my original work, and has not been presented for a degree in any university nor published anywhere.

Signature _____

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This dissertation is written and submitted as requirement for the award of the master's degree in paediatric and child health with the approval of my supervisors.

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List of Abbreviations

KDHS – Kenya Demographic and Health Survey

IYCF – Infant and Young Child Feeding

MIYCN – Maternal Infant and Young Child Nutrition

MDG – Millennium Development Goals

UNICEF – United Nations Children’s Fund

WHO –World Health Organisation

USA – United States of America

USAID – United States Agency for International Development

UNFPA – United Nations Population Fund

KNH – Kenyatta National Hospital

IFSS – Infant Feeding Surveillance System

HIV – Human Immunodeficiency Virus

WBTi – World Breast feeding Trends Initiative

DMOH – District Medical Officer of Health.

EBF – Exclusive Breastfeeding

ANC – Antenatal Clinic

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Definitions

1. Adolescent: A person between the ages of 10 – <20 years
2. Early adolescence: Between the ages of 10 – 13 years
3. Mid – Adolescence: Between the ages of 14 – 16 years
4. Late adolescence: Between the ages of 17 – <20 years
5. Exclusive breastfeeding: Providing only breast milk to infants without any additional liquids or solids including water. Undiluted drops or syrups consisting of vitamins, mineral supplements or medicine are allowed.
6. Initiation of breastfeeding: The duration taken for a newborn to start breastfeeding after delivery.
7. Primiparous: A woman who has given birth to her first child

ABSTRACT

Background:

Adolescents make up 18% of the world's population. An estimated 16 million (11%) of all live births worldwide are to girls aged 15 to 19 years. Exclusive breastfeeding for the first 6 months of life has been demonstrated to offer adequate nutrition and prevent common gastrointestinal and upper respiratory tract infections and consequently reduction in childhood mortality. Adolescent mothers face unique challenges and influences when making a choice on how to feed their infants. Adolescent mothers have been shown to deviate from the recommended infant and young child feeding practices thus leading to a large number of infant deaths of children born to them.

Objectives

Comparison of breastfeeding practices between adolescent mothers (aged 14 to 19 years) and older primiparous mothers (aged 20 years and older) in the first 14 weeks after delivery namely initiation of breastfeeding and rates of exclusive breastfeeding at 6, 10 and 14 weeks. Secondary objectives were nutritional assessment at 6, 10 & 14 weeks in both groups and a mortality audit.

Methods

This was longitudinal survey carried out in 3 government health facilities in Dagoretti district, Nairobi County namely Mbagathi District Hospital, Riruta Health Centre and Ngong Road Health Centre. The study participants were recruited from these facilities and followed up for 14 weeks. Weight and length were measured at 6, 10 and 14 weeks in addition to assessment of breastfeeding practices at these time intervals using a questionnaire.

Results

We enrolled 102 adolescent mothers and 102 mothers aged 20 years and above. The mean age of the adolescent mothers was 18.4 years and the mean age for the older mothers was 23.6 years. The study found that 50% of adolescent mothers initiated breastfeeding within 1 hour compared to 48% of the older mothers. There was no significant difference (p value 0.78). The study did not find a significant difference in rates of exclusive breastfeeding between the adolescent mothers and the older mothers at 6, 10 and 14 weeks. The p values for rates of exclusive breastfeeding between the two groups were 0.67, 0.58 and 0.39 at 6, 10 and 14 weeks respectively. A comparison of nutritional assessment at 6, 10 and 14 weeks between the adolescent mothers and those aged 20 years and older did not show a significant difference. We found significantly more deaths among infants born to adolescent

mothers compared to older mothers at 10 weeks (p value 0.03). There were 5 infants who died among those born to adolescent mothers at 10 weeks compared to no deaths among infants born to older mothers at 10 weeks.

Conclusion

There are no significant differences between the breastfeeding practices of adolescent mothers and mothers aged 20 years and older. However there are more deaths among infants born to adolescent mothers at 10 weeks of life compared to older mothers.

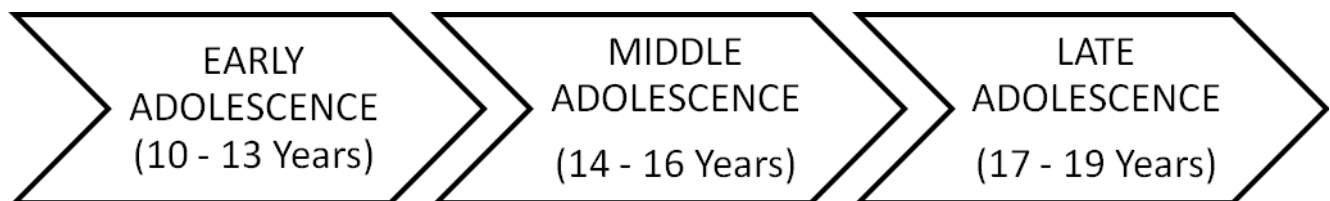
Recommendations

Further studies need to be done on mortality of infants born to adolescent mothers and any associations that may increase the rate of mortality. Counselling of mothers at both the antenatal, postnatal and well baby clinics should be intensified on recommended breastfeeding practices.

LITERATURE REVIEW

In 2005 there were 1.21 billion adolescents in the world and 1 in every 5 people in the world was an adolescent ¹. According to the Kenya Demographic and Health Survey (KDHS) 2008/2009 ², 43% of the Kenyan population is aged below 15 years. In addition nearly 14% of the total population is aged between 10 and 14 years which constitute early to middle adolescence, while 10% of the population is aged 15 to 19 years of age corresponding to middle to late adolescence.²

Figure 1 - Stages of Adolescence (3)



Influence of Motherhood on Adolescent Psychological Development

Adolescence is a period of transition from childhood to adulthood. Sexual activity during adolescence within or outside marriage puts adolescents at risk of sexual and reproductive health problems. These include early pregnancy, intended or otherwise, unsafe abortions, sexually transmitted infections (STIs) including HIV and sexual coercion and violence.¹

Adolescent mothers are often examined by researchers in the context of their role as mothers as opposed to looking at them as also adolescents. There are differences in psychological development of adolescent mothers as compared to non-parenting adolescents and older mothers and this can influence infant feeding choices.

Erik Erikson³ a German psychoanalyst developed a psychosocial theory of development that considers the impact of external factors, parents and society on personality development from childhood to adulthood. The adolescent, who is an individual whose age ranges from 10 to 19 years, must struggle to discover and find his or her own identity while negotiating and struggling with social interactions.³

Erikson⁴ frames psychosocial development in terms of a series of crises that must be appropriately resolved before the individual is able to move successfully into the next phase of development. He suggests that the crisis of adolescence is the challenge of forming a sense of identity, namely the process of coming to an understanding of one's personality, goals, tendencies, and history. The process of resolving this crisis includes several factors. Broadly, the adolescent must "make a series

of ever-narrowing selections of personal, occupational, sexual, and ideological commitments". This process involves the adolescent gaining an understanding of herself in terms of her past actions and her future aspirations. The adolescent must also consider himself or herself a person of value or worth³. Establishing a firm identity and understanding of self is an important step to motherhood so that the mother is able to integrate motherhood into her identity in a homogeneous way that incorporates both positive and negative attributes.

Erikson⁴ believed that before true intimacy can be developed, individuals must have a firm sense of positive role identity, and therefore the adolescents are not yet developmentally ready for truly intimate relationships. Not having achieved the ability to form such relationships has profound implications for the highly intimate mother-child relationship. Erikson also suggests that only after identity and intimacy crises have been appropriately resolved is parenting developmentally appropriate⁴. Both identity role development and development of the ability to establish intimate relationships may be critical to a mother making the best infant feeding choices.

Ketterlinus et al⁵ indicated that a mother's psychosocial developmental level influences her ability to parent, and that adolescent mothers do not maintain the same psychosocial developmental track as adolescents who are not mothers. Ketterlinus et al point out that adolescents have not yet reached adult developmental maturity in a variety of social and cognitive areas. This immaturity affects a young woman's ability to parent because many mothering tasks draw on a woman's social and cognitive abilities to respond, guide, and make choices for her child in appropriate ways.

Piaget⁶ in a study on intellectual evolution from adolescence to adulthood showed that it is often during adolescence that people progress from concrete to formal operational thinking. On achieving formal operational thinking, the adolescents are able to think about the past, present and future in an abstract way.

Epidemiology of adolescent reproductive health

Zabin & Kiragu⁷ found that adolescent pregnancy occurs in all societies with considerable variation in magnitude and consequences among different countries and regions. In each case, a variety of complex socioeconomic factors are involved. For example, in some societies girls are forced into early marriages and are expected to begin their families during adolescence. In such cultures, adolescent child bearing is considered a social norm for marriage or as proof of fertility.

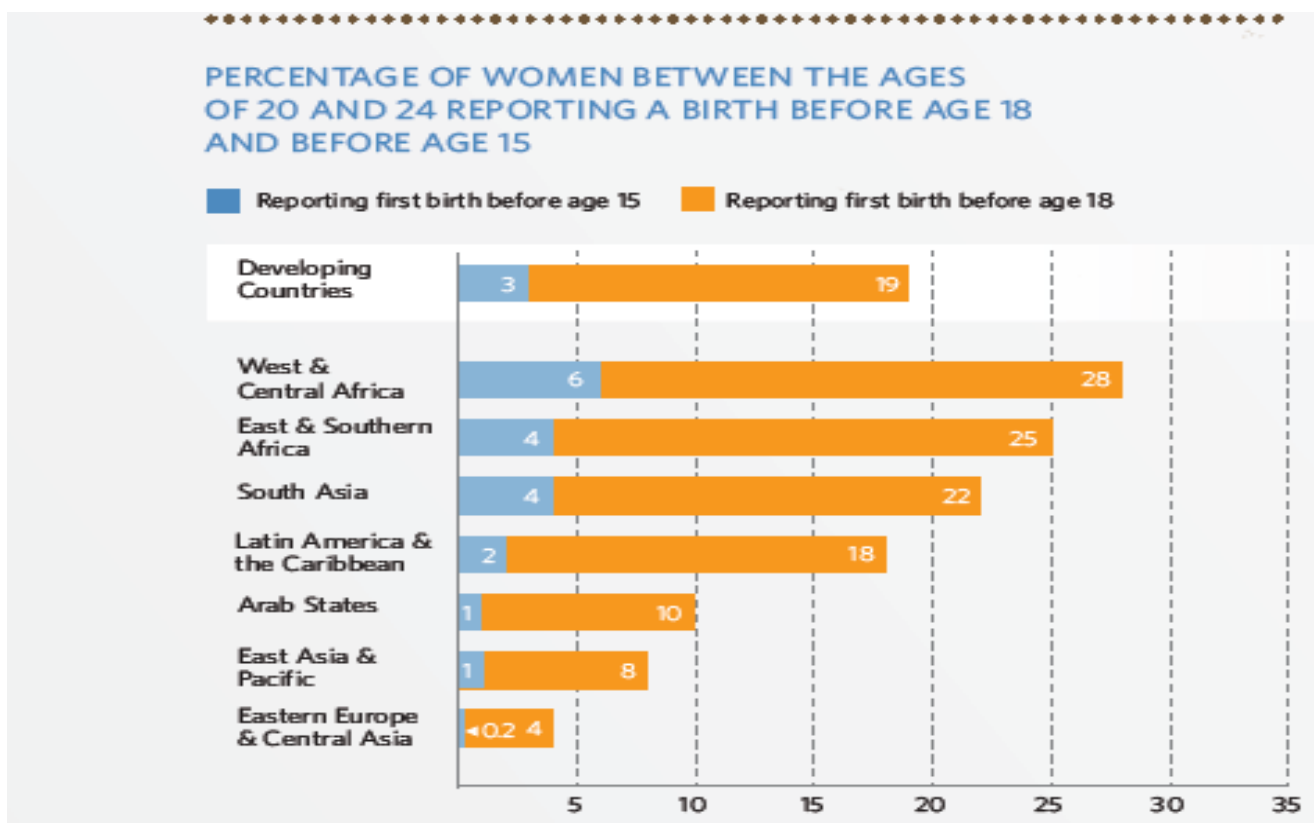
The adolescent birth rate (the number of births per 1,000 women aged 15–19) has declined in almost all regions since 1990, as has the birth rate among women overall. Since 2000, however, the decline in the adolescent birth rate has slowed or, in some regions, reversed. Yet, adolescent birth rates

remain high. At 123 births per 1,000, sub-Saharan Africa today has the highest adolescent birth rate, and this has shown almost no decline since 1990⁸.

According to data on adolescent's birth from Population Reference Bureau⁹, the regional average rate of births per 1000 females 15 – 19 years of age in Sub-Saharan Africa is 101. This is very high compared to the world average of 65 births per 1000 females in this age group. In Kenya, the rate is given as 98 per 1000 females aged 15 to 19 years of age. This is a notable decline from 153 births per 1000 females in this age group in 1980⁹.

Among developing regions, West and Central Africa account for the largest percentage (6 per cent) of reported births before age 15, while Eastern Europe and Central Asia account for the smallest percentage (0.2 per cent) ⁹. The distribution of births among the adolescents is shown in figure 2.

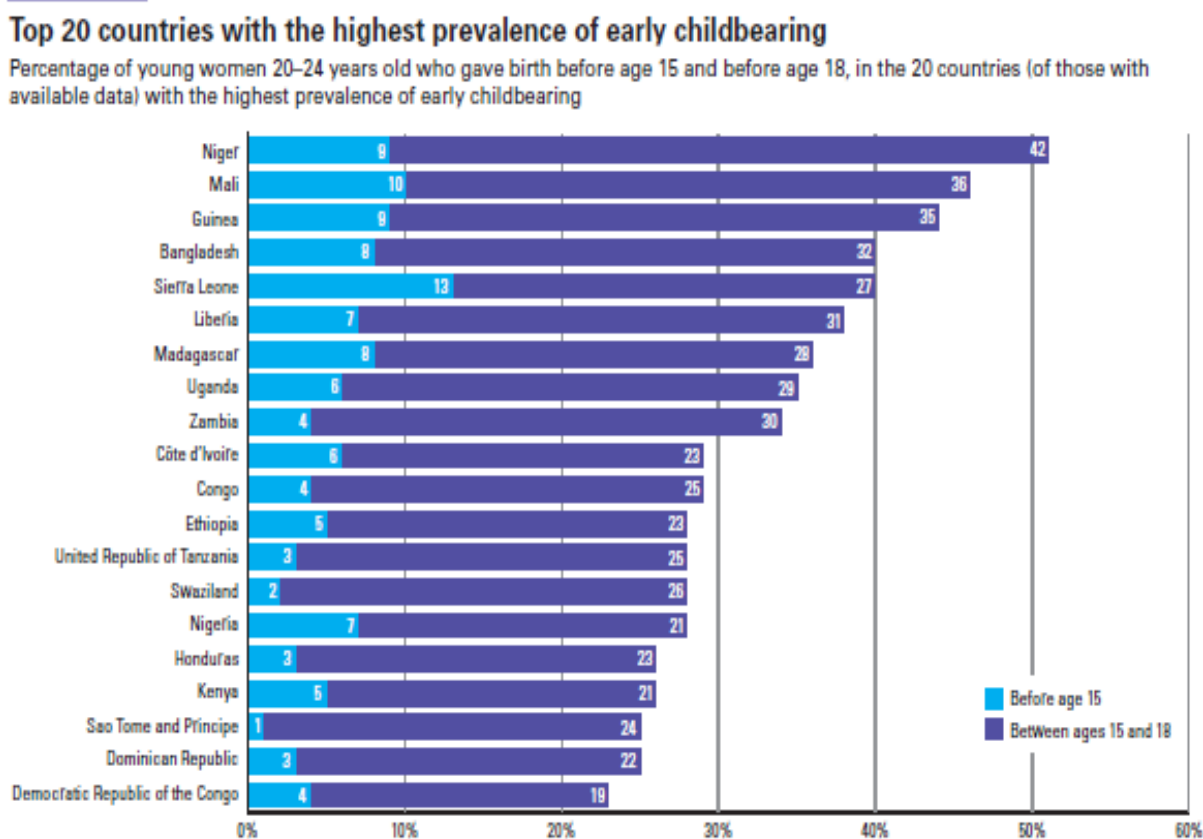
Figure 2: Percentage of women reporting a birth before age 18 and age 15



Adapted from: Population Reference Bureau, the World's Youth 2013 Data Sheet.

More than one in four women in sub-Saharan Africa has given birth before age 18. Still, there are differences among countries at the regional level. Within the West and Central Africa region, for example, 51 per cent of women aged 20–24 in Niger gave birth before age 18, whereas in Mali the figure is 46 per cent and 44 per cent in Guinea. (see Figure 3). These figures are higher than the average of 20% in the developing world. In the three countries with the highest prevalence of early childbearing (Guinea, Mali and Niger) around 10 per cent of women gave birth before age 15⁹.

Figure 3: Top 20 countries with highest prevalence of early child bearing.



Adapted from: Population Reference Bureau, the World's Youth 2013 Data Sheet.

In 1987, Odongo and Ojwang reported the prevalence of adolescent pregnancy among 14 to 19 year olds in two major birth centres in Nairobi, namely Kenyatta National Hospital and Pumwani Maternity Hospital, to be 13.1% and 8.8% respectively¹⁰. However, Odongo and Ojwang only focused on hospital deliveries and did not take into account home deliveries.

Adolescent pregnancy has been associated with increased perinatal mortality when compared to the perinatal mortality among older women. Infants of adolescent mothers are at an increased risk of death before their first birthday than infants of older mothers¹². This is attributed to the poor social

background and characteristics such as poverty, lack of education and psychosocial environmental factors which are more prevalent among adolescent mothers¹¹. Younger mothers are more likely to have low birth weight babies at risk of malnutrition, poor development or death.

Breastfeeding

WHO and UNICEF launched the Baby-friendly Hospital Initiative (BFHI) in 1992 after issuing a joint statement in 1989, which protects, promotes and supports breastfeeding in order to strengthen maternity practices that support breastfeeding¹³. The BFHI contains 10 steps and it recommends initiation of breastfeeding within an hour of birth and includes initiatives such as giving infants no food or drink other than breast milk, rooming in, showing mothers how to breastfeed and maintain lactation among other steps. Early initiation of breastfeeding has been shown to protect the new born from acquiring infections and hence reducing newborn mortality. A study carried out in Ghana by Edmon et al ¹⁴ provided epidemiological evidence that the risk of death as a result of neonatal infection increased with increasing delay in initiation of breastfeeding.

WHO¹⁵ together with several national authorities¹⁶ recommend exclusive breastfeeding for the first 6 months of life followed by introduction of nutritionally adequate complementary food in addition to continued breastfeeding from 6 months to 24 months. Breastfeeding is the optimal method of feeding infants and its benefits for general health have been well documented.

According to the World Breastfeeding Trends Initiative (WBTi), Kenya 2012¹⁷ 58.1 % of babies are breastfed within 1 hour of birth. The national MIYCN strategy target is to increase this rate of 58.1% to 80% by 2017. From the KDHS 2008/2009², only 32% of infants are exclusively breastfed during the first 6 months of life. MIYCN strategy is to increase this from 32% to 80% by 2017. The KDHS findings are shown in table 1.

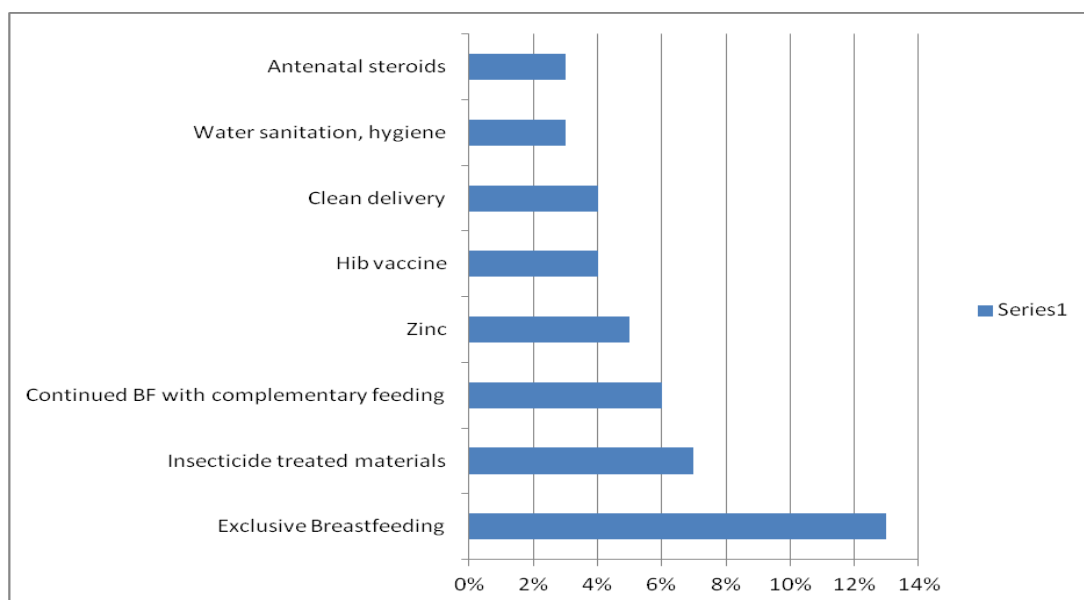
Table 1: Situation of Breastfeeding and complementary feeding Practices in Kenya

Practices	KDHS 1998	KDHS 2003	KDHS 2008 - 2009
Initiation of breastfeeding. Percentage of babies breastfed within the first 1 hour of birth	58%	52%	58%
Exclusive breastfeeding for the first 6 months	12%	13%	32%

Exclusive breastfeeding for the first 6 months of life protects infants against common childhood illnesses such as diarrhoea and acute respiratory tract infections thus contributing to reduced mortality¹⁸.

The Millennium Development Goal (MDG) 4¹⁹ aims to reduce mortality among the under fives by two thirds by the year 2015. Lancet survival series 2003²⁰ showed that exclusive breastfeeding can reduce under five mortality by 13% and hence contribute to reduction in the overall mortality of under fives.

Figure 4: Proportion of under fives deaths that could be prevented by Universal coverage with the preventive interventions



Adapted from: The Lancet Child Survival Series 2003

Breastfeeding practices among the adolescent mothers

An aspect that has few studies carried out is how soon adolescents initiate breastfeeding and the rates of exclusive breastfeeding among adolescent mothers. A focused report on infant feeding among adolescent mothers from Durham region based on an Infant Feeding Surveillance System²¹ was prepared to cover a period from 2006 to 2011. Findings were that 84% of adolescent mothers aged 15 to 19 years initiated breastfeeding as compared to 92% of adult mothers aged 20 years and older. (Initiation of breastfeeding was defined as any attempt to breastfeed or provides breast milk to baby regardless of how long breastfeeding continued).

This surveillance also reported that adolescent mothers were significantly less likely to continue to breastfeed or exclusively breastfeed their babies than older mothers. Only 19 % of adolescent mothers breastfed their babies six months or longer as compared to 52% of mothers aged 20 years and older (21).The report also found that breastfeeding rates were significantly lower among adolescent mothers at all time points and the gap in rates increased with increasing infant age. Two weeks after the birth of their babies, only two thirds, (66%), of adolescent mothers continued breastfeeding. This dropped further to only 40% still breastfeeding at 2 months and 19% at 6 months. In comparison, more than half of adult mothers (52%) breastfed for 6 months or more²¹. This increasing gap in breastfeeding rates with increasing infant age highlighted the importance of providing support to adolescent mothers for breastfeeding to continue.

In the USA, Scanlon et al 22 found that over half of the mothers under the age of 20 years initiate breastfeeding. Initiation of breastfeeding was defined as any attempt to breastfeed or provides breast milk to baby regardless of how long breastfeeding continued). A National Immunisation Survey between 2004 and 2008 22 found that 19% of mothers less than 19 years of age in the USA continued to breastfeed at 6 months post partum compared with 34% of mothers age 20 – 29 years and 49% aged 30 years and above.

A study done in North Carolina that explored Infant Feeding among Teen mothers by Tucker et al 23 found that 52%, 196 of the 389 teen mothers initiated breastfeeding but 98 of those who initiated breastfeeding stopped within the first month postpartum. Common barriers included not liking breastfeeding, returning to school, nipple pain and insufficient milk. The study recommended that there was need for individualised follow up for the teen mothers after hospital discharge in the post partum period.

In a study carried out in Wakiso district in Central Uganda by Atuyambe et al ²⁴ focusing on adolescent and adult first time mothers' healthcare seeking practices for their children showed that adolescents had poorer healthcare seeking behaviour for themselves and for their children. The study also found that adolescent mothers were more likely to delay initiation of breastfeeding compared to older mothers. The adolescent mothers started breastfeeding after 2 days and this could have been due to anxiety, inadequate support and ignorance about breastfeeding.

Hudley et al ²⁵ carried out a study in Ethiopia in 2005 that sampled 2077 adolescents aged 13 to 17 years both male and female, and assessed how their attitudes and expectations deviated from the Infant and Young Child feeding recommendations. The theory behind the study was that cultural attitudes and norms are important factors recognised by WHO as determinants of infants and child

feeding behaviour. Many cultural norms are internalised early in life. The study found that the adolescents' attitudes and intentions deviated widely from the international recommendations on Infant and Young Child feeding. The adolescents overwhelmingly endorsed items related to early introduction of non – breast milk liquids and solids and fewer than 11% of the girls agreed that a 5 month old baby should be exclusively breastfed. Recommendations made included development of interventions for adolescent such as nutrition education in order to prevent poor feeding choices when they became parents ²⁵.

A qualitative study by Hannon et al ²⁶ using semi-structured ethnographic interviews and focus groups involving 35 Latino and African Americans girls between 12 to 19 years identified 3 main influences on infant feeding decisions and practices. These were their perception of benefits and problems of breastfeeding and influences by their mothers, husbands or boyfriends on choice of feeding. The study concluded that these perceptions and influences identified by the adolescents are helpful to health care providers as they counsel adolescent mothers about infant feeding options.

RESEARCH QUESTION/ HYPOTHESIS

Is there a significant difference in the breastfeeding practices in the first 14 weeks after delivery between adolescent mothers aged 14 to less than 20 years and older primiparous mothers aged 20 years and older in Dagoretti District health facilities?

STUDY JUSTIFICATION

MDG 4 aims at reducing infant the under fives mortality by two thirds by the year 2015. Studies have shown that initiation of breastfeeding within 1 hour of life and exclusive breastfeeding for the first 6 months of life can significantly reduce infant and under fives mortality rates and hence contribute to achieving MDG 4.

Global studies have shown that adolescent mothers have been known to have delayed initiation of breastfeeding their infants and are also less likely to exclusively breastfeed their infants for 6 months. This contributes to increased number of deaths among infants born to adolescent mothers and subsequently increases overall infant mortality rate. The various studies done on breastfeeding do not focus on the adolescent motherhood hence there exists a gap in this area. This study showed the breastfeeding practices among adolescent mothers and how these practices differ from the recommended practices in a peri-urban setup. This study hopes to help formulate antenatal and postnatal policies specifically targeted at the adolescent mothers so as to help improve their breastfeeding practices and in the long run help in realizing our targets for MDG 4.

STUDY OBJECTIVES

Broad objective

To compare breastfeeding practices during the first 14 weeks after delivery between adolescent mothers aged 14 to less than 20 years and mothers older than 20 years in health facilities in Dagoretti District.

Specific objectives

1. To compare time to initiation of breastfeeding after delivery between primiparous adolescent mothers aged 14 to less than 20 years and primiparous mothers aged 20 years and older.
2. To compare proportion of exclusive breastfeeding at 6, 10 and 14 weeks between the two groups of adolescent mothers 14 to less than 20 years and primiparous mothers 20 years and older at 6, 10 and 14 weeks.

Secondary objectives

1. To explore factors responsible for early cessation of breastfeeding in adolescent mothers. Potential factors include return to school, influence from other person e.g. mother, grandmother, husband/boyfriend, sibling, insufficient milk, worried about maintaining looks and being seen breastfeeding.
2. To compare nutritional status of the babies born to adolescent mothers aged 14 to less than 20 years and mothers aged 20 years and older at 6, 10 & 14 weeks.
3. To audit mortality in the first 14 weeks after delivery between the two groups.

STUDY METHODOLOGY AND DESIGN

Study design

This study was a longitudinal survey cohort design, conducted from birth till 14 weeks of age.

Study sites

The study sites were 3 health facilities located within Dagoretti district in Nairobi County, namely Mbagathi district hospital, Ngong Road Health Centre and Riruta Health Centre.

Dagoretti constituency falls within Nairobi County. It lies in the periphery of the city. Part of it lies in a rich agricultural zone where crops like vegetables and fruits are grown in plenty. There is commerce in the form of trading and informal sector activities. Residents of this area are also employed in the public and private sector. The constituency has a mixture of people from all levels of socioeconomic status.

Mbagathi district hospital in the first quarter of 2013 had a total of 503 deliveries at the facility with 59 patients being under the age of 19 years. Ngong Road health centre attended to 124 mothers in the postnatal clinic and Riruta health centre had 323 women attending postnatal clinic.

Study population

Study population consisted of mothers who delivered at the health facilities or sought postnatal and well baby clinic services at the above selected government health facilities that met the eligibility criteria and consented to participate in the study.

The health facilities were chosen based on convenience of accessibility and high numbers of mothers seeking healthcare services at the facilities.

Eligibility criteria

Inclusion criteria

1. All mother – infant pairs, adolescent and older primiparous mothers who sought care at the chosen study clinics at delivery, at 2 weeks after delivery and at the post natal clinic, who consented to participate in the study.
2. All mother – infant pairs, adolescent and older primiparous mothers who sought well child care at 6, 10 and 14 weeks after delivery at the study clinics, who consented to participate in the study.
3. All mother – infant pairs, adolescent and older primiparous mothers, who were breastfeeding at 2 weeks of age.
4. All mother infant pairs who gave informed consent to participate in the study.

Exclusion criteria

1. Severe maternal illness at delivery that reduced her ability to initiate and maintain breastfeeding.
2. Premature or Low birth weight babies < 1.8 kgs.
3. Sick babies who were not able to start breastfeeding immediately.
4. Refusal to give consent.
4. Mothers not intending to seek post natal care at study clinics up to 14 weeks.
5. Mothers who had no access to mobile telephones.
6. Infant death before 2 weeks of age.

Sample size

The following formula proposed by Lemeshow and Lwanga, 1991²⁷ for estimating relative risk with specified relative precision was used. This was based on a study conducted in Durham²¹ and the KDHS².

$$n = \frac{Z_{1-\alpha}^2 [(1-p_1)/p_1 + (1-p_2)/p_2]}{[\log_e(1-\varepsilon)]^2}$$

Where

(a) Anticipated probability of EBF among “older” mothers at 6 months	30%
Anticipated probability of EBF among “young” mothers at 6 months	20%
Anticipated relative risk	1.5
(b) Confidence level	95%
(c) Relative precision (ε)	40%

$$n = \frac{1.96^2 [(1-0.3)/0.3 + (1-0.2)/0.2]}{[\log_e(1-0.4)]^2}$$

n = 93 mothers per age group

2n = 186 mothers

Allow for 10 % non response or dropout rate

N = 102 mothers per age group

Study procedure

The study was carried out by the principal investigator with the assistance of two research assistants. The assistants were trained on how to identify eligible participants, how to approach and explain the aspects of the study, how to obtain informed consent, how to conduct interviews and how to assess nutritional status of the babies.

The women were recruited from the labour ward, the 2 week post natal clinic and the MCH clinic at the chosen study sites.

Training package for research assistants

The training for the research assistants included:

- Inclusion & exclusion criteria for recruitment of participants.
- How to explain the study procedure and obtaining written & informed consent.
- Definitions of exclusive breastfeeding and how to assess for any problems with breastfeeding.
- How to administer the questionnaire.
- How to perform a nutritional assessment by taking weight, head circumference and height during the clinic visits.

Recruitment procedure

Consecutive sampling was used to identify study participants. At the study sites, the principal investigator and the research assistants identified primiparous women then confirmed their ages from the mother child booklet or from national identity cards for those were older than 18 years and had carried their identity cards.

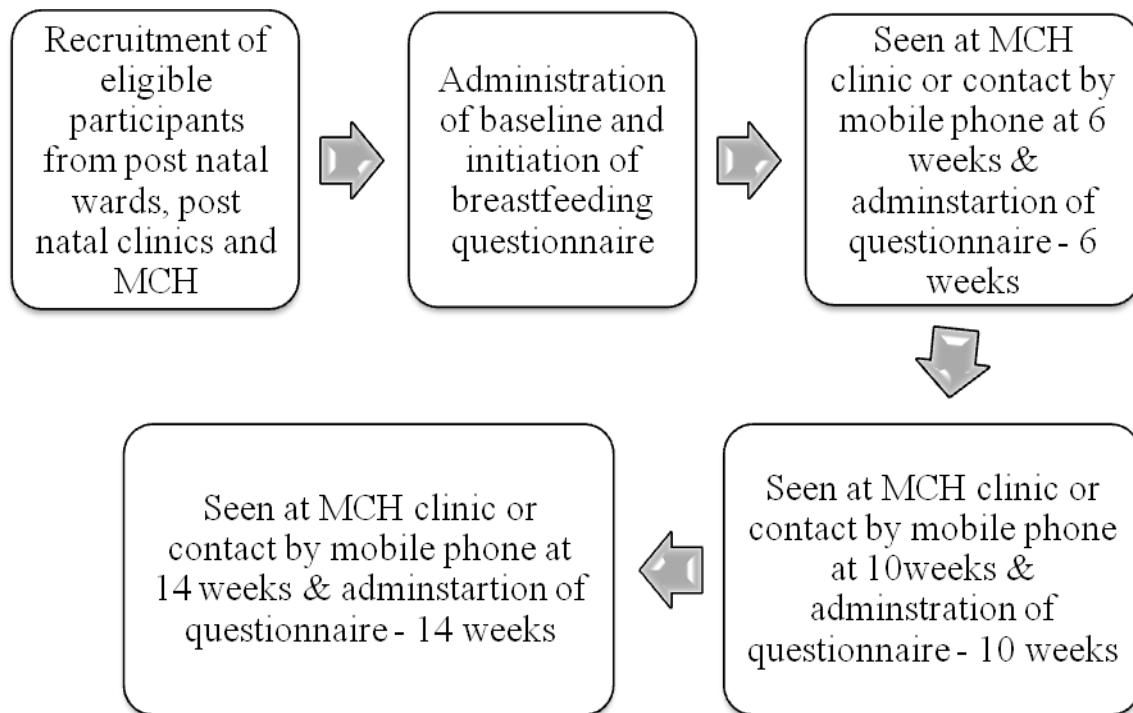
Women who met the inclusion criteria were approached by a recruiter, either the principal investigator or research assistants and the study was introduced and explained to them. Women who met the inclusion criteria and agreed to participate in the study signed a written informed consent and responded to a baseline interview to provide data on basic demographic characteristics, birth weight and initiation of breastfeeding.

Birth weight was then confirmed from the well baby card, on which birth weight is recorded, or from hospital records if delivery was at the study site. For the participants aged less than 16 years, parental or guardian consent was sought.

The enrolled participants were interviewed using the baseline questionnaire (Appendix 4). Interviews were then subsequently conducted in person at the well baby clinics at 6, 10 and 14 weeks after delivery at the well baby clinics in the study sites. Those who missed clinic appointments or could not be traced at the study site were contacted via mobile telephone also at these time intervals and the questionnaire administered on the telephone.

The enrolled study participants were asked to provide alternative contacts in case they could not be contacted by one given contact number, for example the parents of the adolescent mothers who may not have mobile telephones. All cell phone communications between clinicians and study participants were recorded in a study log.

Figure 4 - Study Procedure



Data collection and management

Confidential questionnaires were completed for all participants after recruitment. The baseline questionnaire assessed demographic characteristics, socioeconomic status, ANC attendance and source of information on breastfeeding. Infant feeding practices assessed were initiation of breastfeeding and any pre-lacteal feeds given.

At 6, 10 and 14 weeks, the interviewer obtained data on vital status, infant feeding practices, cessation of breastfeeding and problems encountered during breastfeeding.

Data was coded and entered into Microsoft Access 2007 database. Data entry and cleaning was conducted concurrently after data collection. STATA version 12 was used to analyze data with the assistance of a biostatistician.

T test was used to compare average time taken for initiation of breastfeeding between the 2 groups.

A comparison of means was done when comparing the proportion of adolescent mothers still exclusively breastfeeding at 6, 10 and 14 weeks and those older mothers still exclusively breastfeeding at these time points.

Ethical considerations

- a) The study was conducted after getting approval from the University of Nairobi Kenyatta National Hospital Ethics and Research Committee.
- b) Approval was also obtained from the Nairobi City Council, office of the DMOH, and the respective facility in-charges at the chosen study sites.
- c) A valid, informed consent was sought from the mothers prior to inclusion in the study. No mother was victimized for declining to participate in the study, as this is a voluntary process.
- d) The nature of the study was explained to the personnel at the study clinics at the MCH and labor wards.

Autonomy

There were no additional costs for participation in the study and the participant was free to withdraw from the study at any stage without penalty.

Informed consent

The study was carried out only after informed consent had been obtained. In this study, adolescents aged 14 to 16 years could give assent but also required parental or guardian consent. Those aged 16 to less than 18 years were considered emancipated minors and could thus give consent.

The study participant had the details of the study fully explained to them before recruitment into the study. The participant then signed the written informed consent form. (APPENDIX I)

Confidentiality

Confidentiality was maintained at all times during the study. Mothers were assured that only the principal investigator and research assistants would conduct the interviews either in person or by mobile telephone calls. When telephone contacts were made, no confidential information about the mother or her baby was disclosed to a third party. Data forms did not bear patient name or clinic number and the participants were only identified by study numbers. Data obtained was kept under lock and key and in password protected computer files to restrict access.

Results

The study recruited and followed up 102 teenage (14-19 years) mothers and 102 older primiparous mothers during the months of September to November 2013. They were enrolled from 3 study sites mainly: Mbagathi District Hospital (24%), Ngong Road Health Center (26%) and Kiruta Health Center (50%). The follow-up for each mother-infant pair lasted 14 weeks. A proportion of mothers were lost to follow up: 23(11.2%) Adolescent mothers lost to follow up were 9 (39%) and 14 were mothers aged older than 20 years. These mothers could not be traced by mobile telephone or had moved to their upcountry homes during the December holiday season. Comparisons of the basic characteristics of the mothers are presented in Table 1 according to age category.

Table 1: Characteristics of recruited adolescent and adult mothers in Dagoretti District

Characteristic	14-19 year	20 and above
	N = 102	N = 102
	Number(%) or Mean (SD)	
Age in years	18.4 (0.8)	23.6 (2.8)
ANC attendance	96(94.1)	100(98.0)
Level of education	Tertiary	3(2.9)
	Secondary complete	23(22.5)
	Secondary incomplete	30(29.4)
	Primary complete	36(35.3)
	Primary incomplete	8(7.8)
Employment status	Employed	10(9.8)
	Not employed	90(88.2)
Marital status	Married	72(70.6)
	Single	29(28.4)
Number of rooms in residence	One	74(72.5)
	Two	19(18.6)
	Three	8(7.8)

From Table 1 above, the age range for the teen age mothers was 14 to 19 years and 20 to 34 years for older age group and mean age for the two groups was 18.4 and 23.6 years, respectively. ANC

attendance rates were high in both groups (94.1% versus 98%). Most teenage mothers had not completed primary education (35.3%) while older first time mother had completed secondary education (45.1%). Majority of mothers in both age groups were unemployed, married and lived in single roomed houses.

Initiation of breastfeeding

Table 2: Comparison of breastfeeding practices at birth

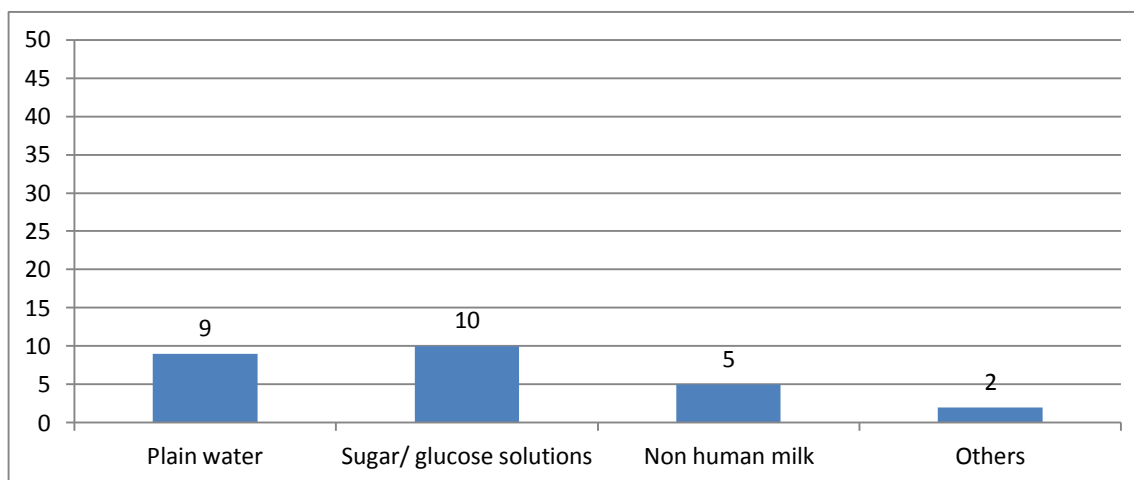
		Maternal age		P value
		14-19 year N = 102 No. (%)	above 20 yrs N = 102 No. (%)	
Breastfeeding initiated	< 1 hrs	50(49.0)	48(47.1)	0.78
	After 1 hour	52(51.0)	54(52.9)	
Gave colostrum	Yes	97(95.1)	96(94.1)	>0.99
Pre lacteal feeds given	Yes	13(12.7)	11(10.8)	0.91
	No	85(83.3)	87(85.3)	

There was no significant difference in time to initiation of breastfeeding between the 2 groups with a P value of 0.78, OR 0.99 and 95% CI 0.90 – 1.08.

Pre lacteal feeds

The commonest pre lacteal feed given was sugar/ glucose solution followed by plain water then non human milk. The types of pre lacteal feeds are illustrated in figure 2.

Figure 2: type of pre lacteal feeds



Follow up data

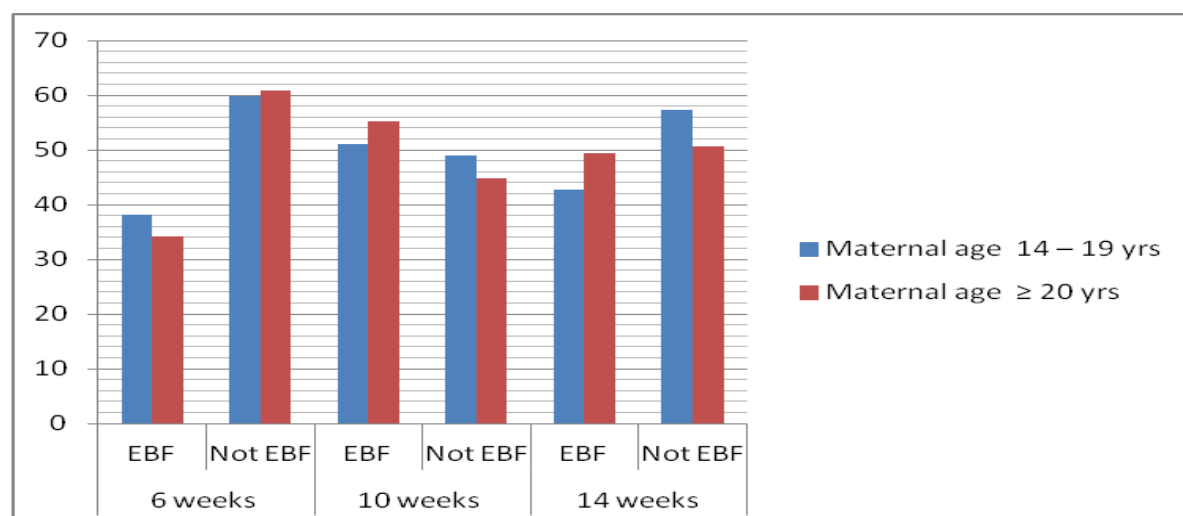
Table 3: Comparison of proportion of exclusive breastfeeding at 6, 10 and 14 weeks

Time Points	Maternal age		Odds Ratio	P value	95 % Confidence Interval	
	Number (%)					
	14 – 19 yrs	≥ 20 yrs				
6 weeks N = 200	39 (38.2%)	35 (34.3%)	1.02	0.67	0.93	1.12
10 weeks N= 188	46 (51.1%)	53 (55.2%)	1.03	0.58	0.93	1.13
14 weeks N = 165	35 (42.7%)	40 (49.4%)	1.05	0.39	0.94	1.16

There was no significant difference in the proportion of mothers exclusively breastfeeding among the adolescent and older mothers at the given time points as shown in the table above.

The comparison of exclusive breastfeeding is illustrated in figure 3.

Figure 3: Comparison of Exclusive Breastfeeding.



Comparison of nutritional status at 6, 10 and 14 weeks between adolescent mothers and those aged 20 years and older.

Anthropometric measurements were used namely weight and length for the infants of the mothers who were interviewed at the clinics. Those who were contacted by phone, body length was not obtained. A WHZ (weight for length) score was calculated using these measurements of weight and length. There was no significant difference in the number of infants born to adolescent mothers and those born to older mothers with a WHZ score of ≤ -2 . The comparison of nutrition status is illustrated in table 4 below.

Table 4: Comparison of nutritional status

Time points	WHZ score	Maternal age		Odds Ratio	P value	95% Confidence Interval	
		14 – 19 yrs	≥ 20 years				
6 weeks N= 190	≤ -2	6 (6.1%)	5 (5.5%)	0.98	0.87	0.80	1.20
10 weeks N= 153	≤ -2	4 (5.1%)	6 (8.1%)	1.09	0.45	0.87	1.35
14 weeks N= 129	≤ -2	6 (9.3%)	11 (17%)	1.18	0.08	0.98	1.43

A mortality audit was done at 6, 10 and 14 weeks and it showed the number of infant deaths at these time points comparing deaths of infants born to adolescent mothers and infants born to mothers aged 20 years and older. The results of the mortality audit are shown in table 5.

Table 5: Infant vital status

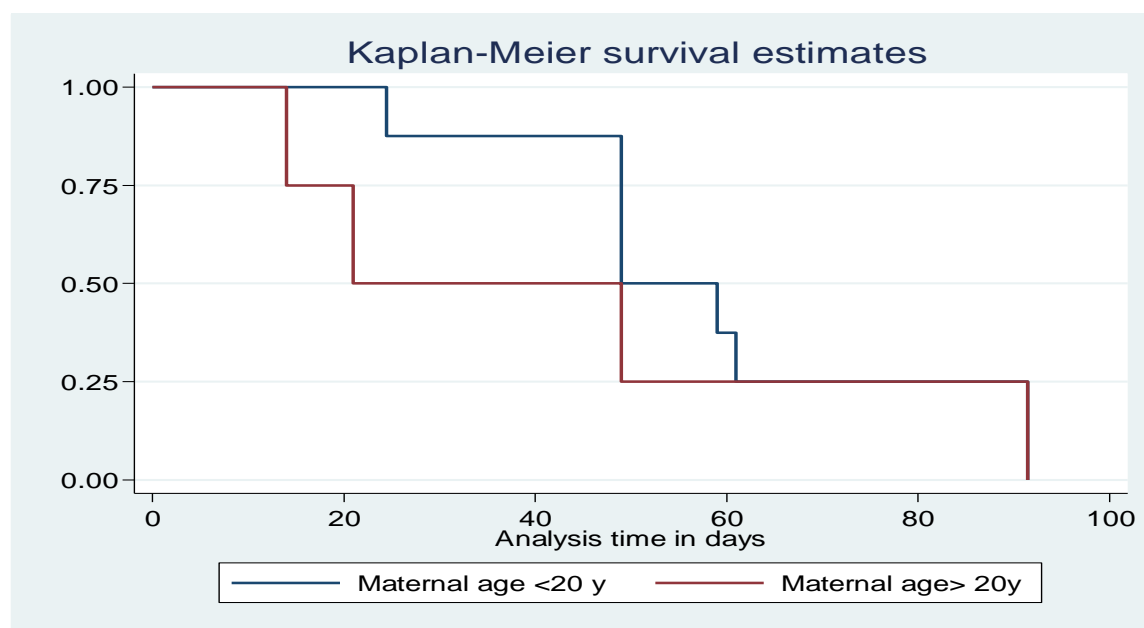
		Maternal age		Fishers exact P
		Number (%)		
Infant vital status		14 – 19 yrs	≥ 20 years	
6 weeks N= 203	Alive	100 (99%)	100 (98%)	1.00
10 weeks N=193	Alive	91 (94.8%)	97 (100%)	0.03
14 weeks N=169	Alive	81 (96.4%)	84 (98.8%)	0.37

A total of 12 mortalities were reported. At the time points of 6, 10 and 14 weeks there was a significant difference in mortality of infants of adolescent mothers and infants of older mothers.

In comparing total infant mortality between the two groups, there were 9 deaths among the infants born to adolescent mothers and 3 deaths among infants born to the older mothers,

A Kaplan – Meier survival analysis (figure 4), was done to compare the risk of mortality between the infants born to adolescent mothers and those born to older mothers. It demonstrates that there is no significant risk of mortality in infants born to mothers in both groups over time in the first 14 weeks after delivery. The log rank P value is 0.464

Figure 4: Kaplan -Meier survival estimates of newborn deaths during 14-week follow-up of newborns of teenage and adult mothers



The most common symptoms exhibited before death were fever, vomiting and difficulty in breathing as shown in table 6.

Table 6: Symptoms baby had shortly before death

Symptoms	Frequency
Yellowness of eyes	1 (8.33%)
Fever	11 (91.67%)
Difficulty in breathing	7 (58.3%)
Vomiting	8 (66.7%)
Diarrhoea	5 (41.7%)

The study found out what types of feeds were given to the infants who were not exclusively breastfed, the reasons the feeds were given and who recommended giving the feeds. A comparison was done of these feeding practices between the two groups of mothers and it is shown in table 7.

The most common reason for giving feeds other than breastmilk was that the baby had colic/abdominal pain.

Table 7: Comparison of feeds given, Reasons and who recommended the feeds.

Time		6 weeks		10 weeks		14 weeks	
Age (years)		14 – 19	≥ 20	14 – 19	≥ 20	14 – 19	≥ 20
Practices Assessed		Number	Number	Number	Number	Number	Number
Feeds given	Plain water	12	6	11	7	8	5
	Non human milk	4	2	5	4	7	10
	Sugar/ glucose water	5	3	6	8	7	3
	Semi solid feeds	0	0	0	1	0	0
Reasons feeds were given	Baby crying	9	10	3	5	11	4
	Baby hungry	3	2	5	3	6	4
	Colic/ abdominal pain	14	17	11	12	10	5
	Mother no milk	1	0	4	0	5	5
Who recommended giving infant feed above	Grandmother	2	1	1	0	3	1
	Healthcare worker	11	7	5	5	4	0
	Mother	6	9	9	5	8	7
	Relative	11	8	6	7	8	4
	Spouse	5	0	1	0	0	2

Discussion

In this study we found the percentage of babies breastfed within 1 hour for adolescent mothers was 49% and for older mothers 47%. There was no statistically significant difference between the two groups. This is lower when compared to the KDHS 2008/2009² which gave a rate of 58% of babies' breastfed within the first hour after birth. WHO¹³ recommends initiation of breastfeeding for all babies within 1 hour of delivery. The results of this study indicate that timely initiation of breastfeeding is not being done for about half of babies after delivery. The benefits of timely initiation of breastfeeding have been shown by a study carried out in Ghana by Edmon et al¹⁴ and include protection of the infant from acquiring infections thus reducing infant mortality. Informing mothers during antenatal clinics about timely initiation of breastfeeding and also emphasizing to healthcare workers about the same could go a long way in increasing the number of newborns breastfed within an hour of delivery.

The most common pre lacteal feed given was sugar glucose solutions and plain water with others giving non human milk and salt and sugar solutions. The commonest reason for giving pre lacteal feed was that the mother felt she had no milk. This is a common misperception among mothers who have delivered that their milk is not sufficient at birth for the newborn baby. Education by healthcare workers to the mothers during antenatal clinics about benefits and adequacy of the mother's first milk (colostrum) will help remove this barrier to timely initiation of breastfeeding

In this study follow up of all the mothers was done at 6, 10 and 14 weeks to assess breastfeeding practices so as to determine rates of exclusive breastfeeding and compare the two groups of mothers. Follow up at 6 weeks revealed that 38% of adolescent mothers were exclusively breastfeeding compared to 34% of mothers aged 20 years and older. There was no statistically significant difference in these rates with a p value of 0.67. The next follow up was done at 10 weeks and it showed that 51% of adolescent mothers were exclusively breastfeeding compared to 55% of older mothers. There was no significant difference, p value was 0.58. There was an increase in the rate of exclusive breastfeeding at 10 weeks in comparison to 6 weeks likely due to counselling at the well baby clinic promoting exclusive breastfeeding. Assessment at 14 weeks showed that 43% of adolescent mothers were exclusively breastfeeding compared to 49% of older mothers. The p value was 0.39 showing no significant difference. In comparison to a study done in Durham²¹ that found rate of adolescent mother's breastfeeding at 8 weeks was 40% and older mothers 52%, this study did not find a statistically significant difference in rates of exclusive breastfeeding between the two groups. According to the KDHS 2008/2009², 32% of infants are exclusively breastfed for the first 6

months of life. The KDHS² assessed exclusive breastfeeding at a point in time, did not follow up mothers for 6 months and did not specifically assess adolescent mothers in comparison to older mothers.

A factor that may have contributed to the results of this study of not finding significant differences in rates of exclusive breastfeeding among adolescent mothers in comparison to older mothers is the age of the adolescent mothers enrolled. The mean age of the adolescent mothers participating in the study was 18.4 years. This implies that most adolescent mothers who were enrolled into the study were in the late stage of adolescence (17 – 19 years). Studies have shown that this group of adolescents in the late stage have decision making capabilities almost similar to adults and hence their infant feeding choices would not differ much from that of older mothers. However special care needs to be given to the adolescent mother after delivery by health care workers, to ensure that she is guided on the best choice of infant feeding which is exclusive breastfeeding.

This study also compared nutritional status of the infants born to adolescent mothers and those born to older mothers. A weight for length assessment was done i.e. WHZ score at 6, 10 and 14 weeks. A limitation of this assessment was the use of a tape measure to take the length of the infant instead of a recommended length board. The tape measure has been found to be inaccurate and hence unreliable measurements. The health facilities that were the study clinics do not routinely measure the length of infants as is recommended by WHO¹². There was no significant difference in the number of children with a WHZ score of less than -2 between the two groups of mothers at 6, 10 and 14 weeks. However a higher number of infants born to older mothers had WHZ scores less than -2 at 10 weeks (8%) and at 14 weeks (17%) compared to adolescent mothers at 10 weeks (5%) and at 14 weeks (9%). This is unlike studies which have shown infants of adolescent mothers to have a higher prevalence of malnutrition (WHO¹²). The majority of mothers enrolled in the study were from a low socioeconomic background. More of the older mothers were living in one roomed houses compared to adolescent mothers, 72% of adolescent mothers and 66% of older mothers. Low socioeconomic background is a major contributor to malnutrition and hence this difference could have influenced the results of more infants of older mothers having malnutrition.

In this study we found one adolescent mother aged 14 years and 7 months who had stopped breastfeeding because she had to resume school. On comparison to a study done in North Carolina²³ that found that only 26% of adolescent mothers were breastfeeding at 1 month postpartum, our study found a similar reason for one adolescent mother stopping breastfeeding. The North Carolina study²³ also explored barriers to breastfeeding in adolescent mothers some of which included returning to

school, not liking breastfeeding and insufficient milk. Most of the adolescents recruited into this study were in late adolescence and had either completed primary school (35%) or not completed secondary school (29%). The adolescent who stopped breastfeeding was in primary school and chose to complete her studies. The other adolescent mothers who continued breastfeeding likely had to drop out of school in order to raise their infants. We found that 29% of adolescent mothers had not completed secondary school and about 8% had not completed primary school. This can imply that adolescent motherhood interrupts the girl's education.

We also compared mortality between the two groups of mothers at 6, 10 and 14 weeks and a significant difference in mortality was found at 10 weeks where 5 adolescent mothers had lost their babies at 10 weeks due to respiratory illness (based on audit) compared to none in the older mothers group. P value was 0.03. Of the 12 babies who died, only 2 had been exclusively breastfeeding. This can be a contributory cause but the study is not powered to detect a significant association between cause of death and lack of exclusive breastfeeding. Out of the 12 mothers whose babies died, only 1 (8%) had been formally employed. The rest were all unemployed. Only 1 baby died at home, the other 11 died in hospital. These results are comparable to a study carried out in Wakiso District, Uganda²⁴ that showed adolescent mothers have poorer healthcare seeking practices for them and their children. This may have contributed to the increased rate of mortality in the infants born to adolescent mothers in this study though a larger sample size would be required to show this association. Our results show that adolescent mothers and their infants require more care and attention from healthcare workers to be able to detect any problems earlier.

Strengths of the study

1. We followed up study participants for 14 weeks prospectively and hence we were able to determine the mortality and nutritional status among the infants.
2. Interviewer conducted the interviews in a non judgmental way and assured participants of confidentiality of the information given.

Study limitations

1. 11% loss to follow up was encountered.
2. Recall bias may have influenced some of the answers on breastfeeding practices because some of the mothers were recruited at 6 weeks. To mitigate this, the question on initiation of breastfeeding

was specifically grouped into minutes hours or days to enable more accurate recall. Reporting or social desirability bias may have influenced some of the responses given.

3. Most adolescents recruited were in the late stage of adolescence which influenced their infant feeding choices.

4. Lack of standardized tool to measure height/length may have led to some inaccurate recordings when doing nutritional assessment.

5. The study did not have sufficient numbers to make associations on the infant deaths to the breastfeeding practices by the mothers.

Conclusion

There were no significant differences in the time to initiation of breastfeeding, proportion of exclusively breastfeeding and in nutritional status of infants born to adolescent mothers and older primiparous mothers.

One adolescent mother, aged 14 years 7 months, had stopped breastfeeding her infant because she had to resume school.

Significantly more adolescent mothers had infant deaths at 10 weeks as compared to the older mothers. However there is no difference in survival analysis between the two groups when an analysis is done using Kaplan – Meir analysis.

Recommendations

1. There is need to conduct further larger studies on infants born to adolescent mothers to ascertain whether there is an association between breastfeeding practices and mortality.

2. Intensify education and counseling of mothers about recommended WHO practices of timely initiation of breastfeeding within 1 hour after birth and exclusive breastfeeding for the first 6 months of life. This should be done at both the antenatal and postnatal clinics.

References

1. World Health Organization, WHO Guidelines on Preventing Early Pregnancy and Poor Reproductive Outcomes among Adolescents in Developing Countries. WHO, Geneva 2011 pp ix, 130.
2. Kenya Demographic and Health Survey 2008/2009 pages 14 – 15 and 149 – 150. www.measuredhs.com/pubs/pdf/FR229/FR229.pdf
3. Erikson, Erik H. (1993) [1950]. *Childhood and Society*. New York, NY: W. W. Norton & Company. p. 242. ISBN 978-0-393-31068-9.
4. Identity: Youth and Crisis– Erikson, Erik (1956). "The problem of ego identity"(pdf). *Journal of the American Psychoanalytic Association* 4: 56–121
5. Ketterlinus R. D, Lamb M.E & Nitz K. A (1994): Developmental and Ecological sources of stress among adolescent parents, *Family Relations, an interdisciplinary journal of applied family studies* 40(4); 435-441
6. Piaget J. Intellectual Evolution from Adolescence to Adulthood: *Human Development* 15(1972); 1 – 12
7. Zabin S, Kiragu K. The health consequences of adolescent sexual and fertility behaviour in Sub Saharan Africa. *Studies in Family Planning* 1998; 29:210 – 232
8. United Nations Department of Economics and Social Affairs, Population Division, 2011 update for the MDG Database “Adolescent birth rate” POP/DB/FERT/A/MDG 2011.
9. Population Reference Bureau (PRB). The World’s Youth 2013 Data Sheet. www.prb.org/pdf13/youth-data-sheet-2013.pdf
10. Odongo F, Ojwang SBO: Some aspects of teenage pregnancy in Nairobi; A prospective Study on teenage mothers at KNH and Pumwani maternity hospital. *East African Medical Journal* 1990: June 67(6) 432 – 6.
11. WHO Discussion papers on Adolescence. Adolescent Pregnancy- Issues in Adolescent health and development. 2004. http://whqlibdoc.who.int/publications/2004/9241591455_eng.pdf
12. WHO/ UNFPA Pregnant Adolescent. Delivering on Global promises of Hope, Geneva 2006. http://www.who.int/maternal_child_adolescent/documents/9241593784/en/

- 13.** Protecting, promoting and supporting breastfeeding: the special role of maternity services. A joint WHO and UNICEF statement, WHO, Geneva 1989, Page IV, 21
- 14.** Karen M, Edmond et al Effect of early infant feeding practices in infection specific neonatal mortality- an investigation of the causal links with observational study from rural Ghana, American Journal of Clinical Nutrition 2007; 86;1126 – 31
- 15.** Report of the expert consultation on the optimal duration of exclusive breastfeeding. Geneva 28 – 30th March 2001, WHO
- 16.** American Academy of Paediatrics: Breastfeeding and the use of Human Milk, Paediatrics 2005: 115; 469-506
- 17.** World Breastfeeding Trends initiative (WBTi) Kenya 2012 Ministry of Public Health and Sanitation. www.worldbreastfeedingtrends.org/report/WBTi-kenya-2012.pdf
- 18.** WHO Global strategy for infant and Young Child Feeding 2007
- 19.** United Nations Millennium Development Goals 2000 www.un.org/millenniumgoals
- 20.** Jones G, Steketee R. W, Black R. E, et al and the Bellagio Child Survival Study Group. How many child deaths can we prevent this year? The Lancet Child Survival Series 2003; 362:65-71
- 21.** Durham IFSS- Focused Report on Infant Feeding among Adolescent Mothers September 2012
- 22.** Scanlon K S, Grumer S, L. M Chen et al, Racial and ethnic differences in breastfeeding initiation and duration by state- National Immunisation Survey, United States 2004 to 2008; 59: 327 – 334.
- 23.** Tucker, Ellen K, Wilson, et al, Infant feeding experiences among teen mothers in North Carolina: Findings from a mixed methods study, International Breastfeeding Journal 2011; 6:1 - 14.
- 24.** Lynn Atuyambe, F. Mirembe, Nazarus M. et al Adolescent and first time mothers' health seeking practices during pregnancy and early motherhood in Wakiso District Central Uganda: Reproductive Health Journal 2008; 5:1 - 13.
- 25.** Craig Hudley, David Lindstorm, Tefera Beladew et al, Ethiopian Adolescents' attitudes and expectations Deviate from current infant and young child feeding recommendations, Journal of Adolescent Health; 43: 253-259.

26. Patricia Hannon, S. K. Willis, V. Bishop et al African American and Latina adolescent mothers' infant feeding decisions and breastfeeding Practices- A qualitative study, *Journal of Adolescent Health* 2000; 26:399 – 407.

27. Lwanga S. K and Lemeshow S. (1991). *Sample size determination in health studies: A practical manual*. Geneva: World Health Organization, 1 – 3.

Appendix 1: Consent

Title: Comparison of breastfeeding Practices between adolescent mothers and older mothers in the first 14 weeks after delivery in Dagoretti District

Investigator: Dr. Caroline Wachu Mwangi, University of Nairobi; Department of Pediatrics and Child Health. Contacts 0720539864

Supervisors: Prof. Rachael Musoke, Dr. Dalton Wamalwa, University of Nairobi; Department of Pediatrics and Child Health.

Investigator Note: Thank you for agreeing to read this form. It offers information about this study which will help you decide if you will take part in this study or not. Appropriate translation will be carried out in the language you are most comfortable with.

Introduction & Objectives of the study: I am conducting a study to evaluate breastfeeding practices among adolescent mothers and older primiparous women.

My study aims to evaluate the time to initiation of breastfeeding, exclusive breastfeeding practices and whether there are any barriers to exclusive breastfeeding. I will compare two groups of mothers, those who are adolescents (19 years & below) and those who are older.

You are being asked to participate in the study because both you and your baby meet the inclusion criteria

Procedure: The study requires you to answer questions from an administered questionnaire by the principle investigator and/or a research assistant and to provide mobile contact details so that you can be contacted if unable to visit the MCH clinic. Interviews and nutritional assessment will be conducted during the MCH visits at 6, 10 and 14 weeks after delivery.

Benefits: The results of the study will help us get important information that may help in formulating policy at national level on breastfeeding practices among adolescents.

As a participant, you will be assisted in the well baby clinic for your child to get all the necessary immunizations.

There are no risks to you and your baby when you are involved in the study. We will be conducting non-invasive nutritional assessment by taking a weight, height and head circumference of your baby when they are born, at 6, 10 and at 14 weeks of age.

The study will be done for a period of 14 weeks after the birth of your child

Voluntarism: Your participation in the study is voluntary and you are free to withdraw from the study even after recruitment without consequences.

Confidentiality: All information obtained from the interview and assessment process will be kept confidential.

Ethical consideration: I have been granted approval from the Research and Ethics Committees to conduct this study. Inquiries on ethical considerations can be gotten from:

Prof. M. L. Chindia

Secretary, KNH/UON-ERC,

Kenyatta National Hospital,

Hospital Rd, along Ngong Rd,

P.O.Box 20723, Nairobi

Tel: (020) 726300-9 Fax: 725272

Appendix 2: Consent form (English)

Comparison of breastfeeding Practices between adolescent mothers and older mothers in the first 14 weeks after delivery in Dagoretti District

To indicate that you understand the conditions of this study and that you consent to participate in it, please sign or put your thumbprint in the space provided below.

Mother – Infant No.....

I, Mr./Mrs./Ms....., the parent of
(child’s name).....

Agree to the above and give consent for me and my child to be included in this study.

As explained to me by.....

I understand the purpose of the study and conditions of participation

Sign..... Date.....

Consent by guardian/ spouse for those aged 14 years to less than 16 years

Name: Sign:

Date:

Witness Sign..... Date.....

Appendix 3: Idhini ya mzazi wa watoto (Kiswahili)

Comparison of breastfeeding Practices between adolescent mothers and older mothers in the first 14 weeks after delivery in Dagoretti District.

Jina langu ni Daktari Caroline Mwangi kutoka chuo kikuu cha Nairobi. Ninasoma katika shule ya Kutibu watoto. Ninafanya utafiti wa kuchunguza jinsi mama wanavyonyonyesha watoto wanapozaliwa. Huu utafiti unawachunguza mama ambao wako kati ya miaka 14 na 19 na waliyo zaidi ya miaka 19 ambao wamepata mtoto wa kwanza.

Unaombwa kuwa mmoja wa mama na watoto watakao tumiwa kwa utafiti huu.

Hakuna kulazimishwa kushiriki katika utafiti huu, na hakuna pesa ambayo utapata. Ukikubali kushiriki kwa utafiti huu kuna manufaa yafuatayo:

1. Matokeo ya utafiti huu yatasaidia wale ambao wanahusika na kutengeza sheria za kunyonyesha kubadilisha hizi sheria.
2. Ukileta mtoto wako kupewa chanjo katika kituo cha utafiti, utasiadiwa kufanya hivyo.

Ukipeana idhini ya kushiriki katika utafiti huu, utaulizwa maswali na utapeana nambari ya simu yako ili uweze kupigiwa simu unapostahili kukuja hospitali mtoto apewe chanjo akiwa na wiki 6, 10 na 14.

Hutalazimishwa kushiriki na unaweza jiondoa wakati wowote bila madhara.

Majibu yako itawekwa siri.

Nambari yangu ya simu ni 0720539864

IDHINI YA MZAZI WA MTOTO Mother – Infant nambari

Mimi ni
mzazi wa (jina la mtoto)

Nimekubali kushiriki katika utafiti huu kama nilivyoielezwa na daktari.....

Sahihi.....Tarehe.....

Shahidi Tarehe.....

Appendix 4: Questionnaire

Comparison of breastfeeding Practices between adolescent mothers and older mothers in the first 14 weeks after delivery in Dagoretti District

To be filled during the interview with the mother. Additional information may be obtained from the mother and child booklet.

Before the interview, all participants must sign an informed consent form.

PART 1: AT INITIAL CONTACT

DATE: -----

1. Code number of the mother – infant pair

Health Facility.....

2. Telephone Number that respondent can be reached (record on call log) _____

3. Alternative telephone contact if unreachable by above number (record on call log) _____

4. Age of the mother in years and months. _____

3. Date of birth of the baby (Day/Month/Year) |__| |__| / |__| |__| / |__| |__|

4. Birth Weight of the baby (kg) _____

4.1 Confirmed from records of card or hospital Yes |__| No |__|

4.2 Height of baby (cm) -----

4.3 Head circumference (cm) -----

5. Marital status

Married |__|

Single |__|

Divorced |__|

Separated |__|

Widowed |__|

6. Residence _____

7. How many rooms

One

Two

Three

8. Level of Education

Tertiary

Secondary complete

Secondary incomplete

Primary complete

Primary incomplete

None

9. Employment status Employed not employed

10. If employed

Professional /technical

Skilled manual

Unskilled manual

Domestic services

Agriculture

Small Scale business

11. Did you attend ANC? Yes No

12. What is your source of information on Breastfeeding?

Mother / mother in law

Friends

Media

Medical staff

INFANT FEEDING PRACTICES

Breast feeding Initiation and frequency (first contact only)

1. Did you ever breastfeed your infant? 1=Yes 2=No ----- /

(If no, end of questionnaire)

2. How soon after delivery was your infant first put to the breast?

Days

Hours

Minutes

3. Did you give your infant the first milk that comes from your breast?

Yes

No

4. Did your baby receive anything to eat/drink before your milk came in?

1 = Yes

2 = No

3 = don't know

(If no, go to question 5)

4.1 What did the baby receive?

Plain water

Vitamins mineral drops

Sugar or glucose water

Liquid medicine

Honey	<input type="checkbox"/>	Other	<input type="checkbox"/>
Herbal preparations	<input type="checkbox"/>		
Non – human milk	<input type="checkbox"/>		
Semi solid food	<input type="checkbox"/>		

4.2 What was the reason for giving the above named item?

Child was crying	<input type="checkbox"/>	Child refused to breastfeed	<input type="checkbox"/>
Child was hungry	<input type="checkbox"/>	Mother was tired	<input type="checkbox"/>
Child was thirsty	<input type="checkbox"/>	Mother was sick	<input type="checkbox"/>
Child had colic/gas/abdominal pain	<input type="checkbox"/>	Mother had breast problems	<input type="checkbox"/>
Child had diarrhoea	<input type="checkbox"/>	Mother had no milk	<input type="checkbox"/>
Child was not well	<input type="checkbox"/>	Mother had died	<input type="checkbox"/>
Traditional belief	<input type="checkbox"/>	Other Reason	<input type="checkbox"/>
No reason offered	<input type="checkbox"/>		

4.3 Who recommended giving it to the infant?

Mother / mother in law	<input type="checkbox"/>
Spouse	<input type="checkbox"/>
Grandmother	<input type="checkbox"/>
Health care worker	<input type="checkbox"/>
Relative	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

Vital status at 6, 10, 14 weeks

Baby A D

If alive proceed with Nutritional and breastfeeding assessment

If dead proceed to Appendix 5

NUTRITIONAL ASSESSMENT AT 6, 10 AND 14 WEEKS

AGE	WEIGHT (kg)	HEIGHT (cm)	HEAD CIRCUMFERENCE (cm)
6 weeks	-----	-----	-----
10 weeks	-----	-----	-----
14 weeks	-----	-----	-----

Breastfeeding assessment at 6, 10 and 14 weeks

1. At any time after leaving the hospital, have you or anyone else given your infant anything to eat or drink other than your breast milk?

1 = Yes 2 = No 3 = Don't know

2. What was given to the infant?

- Plain water
- Sugar or glucose water
- Honey
- Herbal preparations
- Non – human milk
- Semi solid food
- Vitamins mineral drops
- Liquid medicine
- Other

3. For how many days have you given this to your infant?

4. What was the reason for giving the item named in 2 above to your infant?

- | | | | |
|------------------------------------|--------------------------|-----------------------------|--------------------------|
| Child was crying | <input type="checkbox"/> | Child refused to breastfeed | <input type="checkbox"/> |
| Child was hungry | <input type="checkbox"/> | Mother was tired | <input type="checkbox"/> |
| Child was thirsty | <input type="checkbox"/> | Mother was sick | <input type="checkbox"/> |
| Child had colic/gas/abdominal pain | <input type="checkbox"/> | Mother had breast problems | <input type="checkbox"/> |
| Child had diarrhoea | <input type="checkbox"/> | Mother had no milk | <input type="checkbox"/> |
| Child was not well | <input type="checkbox"/> | Mother had died | <input type="checkbox"/> |
| Traditional belief | <input type="checkbox"/> | Other Reason | <input type="checkbox"/> |
| No reason offered | <input type="checkbox"/> | | |

5. Who recommended giving it to the infant?

- | | |
|------------------------|--------------------------|
| Mother / mother in law | <input type="checkbox"/> |
| Spouse | <input type="checkbox"/> |
| Grandmother | <input type="checkbox"/> |
| Health care worker | <input type="checkbox"/> |
| Relative | <input type="checkbox"/> |
| Don't know | <input type="checkbox"/> |

Breast feeding frequency (all visits)

6.0 Are you breastfeeding your infant now 1= Yes 2 = No

7.0 How many times did you breastfeed (put infant to breast) yesterday during the daylight hours?

8.0 Was the infant fed on demand during daylight hours?

1 = Yes 2 = No

9.0 Was the infant put to the breast during night time hours?

1 = Yes

2 = No

Cessation of breastfeeding (all Visits)

10.0 Have you stopped breastfeeding your infant every night and day?

1 =Yes

2 = No

11.0 How old was your infant when you stopped breastfeeding him every day and night? (code 00 days for never breastfed and code 99 days for don't know.

Months

Weeks

Days

12.0 What has made you stop breastfeeding? (**mothers aged 20 years & older**)

Infant old enough

Infant no longer wants to breastfeed

Pregnancy

Advised by husband/partner

Advised by mother/ mother in law/ grandmother

Advised by another person

If yes, specify _____

Separation from infant due to work

Adolescent mothers

Resuming school

Worried about maintaining looks

Worried about been seen breastfeeding

- Not enough milk
- Infant refused to breastfeed
- Advised by spouse
- Advised by mother/ mother in law
- Advised by other specify -----

Breast feeding related problems (all visits)

	Event occurred	Infant's age when occurred
	1 = Yes; 2 = No	
01	breasts engorged <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
02	pain during feeding <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
03	infant doesn't want to nurse <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
04	infant nurses too often <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
05	infant not able to suckle <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
06	not enough milk <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
07	cracked nipples, sore nipples <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
08	breast or areola abscesses/oozing sore <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
09	mastitis or breast inflammation <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
10	nipple exudates/rash/itching <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
11	mother sick <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	If yes specify _____	
12	other <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Specify _____	

Appendix 5: Call log

Serial Number	Mother-Baby Pair Number	Telephone Number	Call 1	Call 2	Call 3
1			<u>Date</u> <u> / / </u>		
2					
3					
4					
5					

Call logs

The call logs were kept to call mothers who missed their clinic appointments to enquire about:

- Vital status of the baby
- The weight of the child?
- Assessment of exclusive breastfeeding practices

Appendix 6: Mortality Audit

1. Age at which baby died -----

2. Baby died at Hospital

 Home

3. Cause of death (verbal report by mother) -----

4. Symptoms Baby had shortly before death

 Yellowness of eyes (Jaundice)

 Fever

 Difficulty breathing

 Hypothermia

 Vomiting

 Diarrhoea

 Others (specify) -----