

## **IMPORTANCE OF BREASTFEEDING**

Breastfeeding decreases morbidity and mortality from diarrhoeal diseases since breast milk has unique properties of enhancing the immune system of the infant. It promotes infant growth and development. It protects the infant against cancers and allergies. It improves mother to child bonding. It has benefits in child spacing and in the first 6 months after birth, full or nearly full breastfeeding, coupled with amenorrhoea can provide upto 98% prevention against pregnancy, this is equal to or better than most reversible contraceptive methods (23).

Absolute contraindications to breastfeeding are rare, they include Tuberculosis in the mother, galactosaemia in the infant.

Special attention needs to be paid to breastfeeding and HIV-infection in the mother as breast milk may serve as a vehicle for transmission of HIV and current recommendations are that HIV-infected mothers in developed countries should refrain from breastfeeding and use the widely available safe alternatives. In developing countries, the risk of HIV-infection via breastmilk is generally considered less than the known benefits of breastfeeding, particularly when alternative feeding methods may be hazardous (24).

## **PHYSIOLOGY OF BREASTFEEDING AMENORRHEA**

It has been known for a long time that breastfeeding causes a variable period of amenorrhoea but its only in the 1980s that scientific attention was focussed on its role in fertility regulation (25). Its now clear that breastfeeding is associated with a reduction in fertility, which is closely related to the duration of amenorrhoea (26).

This has been shown particularly in those population in whom prolonged breastfeeding, in the absence of artificial contraceptive or postpartum sexual abstinence, causes substantial durations of infertility, that may last as long as 2 years or longer (27).

Detailed endocrine studies have shown that inhibition of ovulation through gonadotrophin suppression is a key factor in lactational amenorrhoea (28).

After resumption of menstruation, breastfeeding may reduce fertility to some extent, but the impact is much less marked compared with the period of lactational amenorrhoea (29).

Another factor of importance is that the maintenance of lactational amenorrhoea is suckling dependent (30) (31). Those mother who suckle frequently, for longer periods and maintain breastfeeding at night experience longer periods of lactational amenorrhoea than those who reduce suckling frequency or duration at an early stage, sometimes in response to rapid introduction of supplementary feeds (30, 31).

Breastfeeding practices differ widely across cultures and it is impossible to define a minimum level of suckling that will guarantee the maintenance of lactational amenorrhoea and be applied universally. But many studies have shown that more intensive suckling is associated with longer periods of lactational amenorrhoea (32).

Lactational amenorrhea makes an important contribution to overall fertility as expressed by completed family size, particularly in those countries where use of artificial contraception is low (33). Lactational amenorrhea makes an important contribution to the effective spacing of births and has important advantages for both infant morbidity and mortality.

The Bellagio consensus statement (32), notes that during the first 6 months postpartum, mothers who fully or nearly fully breastfeed and maintain lactational amenorrhea can expect a pregnancy rate of less than 2%. The algorithm incorporates three criteria, the infant is less than 6 months of age, the mother is amenorrheic and fully/nearly fully breastfeeding. The algorithm was developed by Dr. Mirriam Labbok and serves as the basis for the lactational amenorrhea method (LAM) (34).

The robustness of the Bellagio consensus is being tested within a number of different cultural settings and factors that may influence the duration of lactational amenorrhea like maternal nutrition, racial differences, individual biological variations, maternal illness, are being investigated.

The interface between LAM and alternative methods of family planning is being studied, noting that towards the end of LAM, fertile signs are particularly difficult to interpret.

### **LACTATIONAL AMENORRHEA (LA)**

LA is regarded as a period of natural infertility, it is clear that it's the period of LA rather than the period of breastfeeding that should be considered the phase of natural infertility (35, 36). Reviews of International literature have shown that 3 —10% of women conceive during lactational amenorrhea, if they are not otherwise practicing contraception (37,38,39,40).

These are crude indices of the contraceptive efficacy of lactational amenorrhea and are not directly comparable to Pearl pregnancy rates or life table rates. The percentages were uncontrolled for the time postpartum when the mothers conceived.

Current studies suggest that the expected protection afforded by LAM is quite high and competitive with reversible methods of fertility regulation such as pills, IUDS.

In Chile, analysis of 236 urban women found a 0.9 probability of pregnancy at 6 months among amenorrheic women, who did not give their infants breastfeeding substitutes, while menstruating breastfeeding mothers who gave milk supplements had cumulative probabilities of pregnancy of 35.6 and 54.7 at 6 and 12 months respectively (41).

In Australia, the estimated probabilities of pregnancy were 1.7 at 6 months, 7.0 at one year postpartum (36,42).

Analysis of data on 346, amenorrheic women who were not practising contraception in nine studies, in different countries yielded a 12-month cumulative life table pregnancy rate of 5.9% (43). This study reflects combined effects of many breastfeeding patterns and styles and timings of weaning.

A small number of women experience the first normal postpartum ovulation and conceive during the period of LA, but a woman is thought to have no more than one ovulation during amenorrhea, ovulation occurs 0 – 3 weeks before the first postpartum menses. Some women repeatedly experience inadequate menstrual cycles after the end of LA. The earlier in the postpartum period, a woman experiences her first menses, the less likely it is to be preceded by ovulation (30,44,45).

The earlier in the postpartum period, the first ovulation occurs, the less likely it is to be characterized with adequate duration of luteal phase and progesterone production (46).

### **MECHANISM OF ACTION OF LACTATIONAL INFERTILITY:**

During the normal menstrual cycle in the non-lactating woman, the hypothalamus secretes gonadotrophin-releasing hormone (GnRH) in a pulsatile fashion, which in turn triggers a pulsatile release of luteinizing hormonal (LH) from anterior pituitary. LH pulses play a major role in follicular growth and estrogen secretion. During the first days of the cycle, the growing ovarian follicles produce increasing amounts of estrogen, which in turn increases the frequency of LH pulses. When estrogen reaches a critical level there is a surge of LH followed by ovulation in about 17 hours. A corpus Luteum is formed after ovulation, it produces estrogen and progesterone. During the luteal phase, GnRH pulsatility is decreased in association with an increase in hypothalamic opiod activity.

By about four weeks postpartum, plasma levels of LH, return to a level below normal in lactating women, while normal levels are observed in non-breastfeeding postpartum women by the same time (28). In fully breastfeeding women, LH remains at a baseline below normal even in the presence of follicular development.(47)

Presumably, suckling reduces the secretion of GnRH by the hypothalamus, which results in a dampening of LH-pulsatile secretion (48). This presumption was tested by administration of pulsatile GnRH to breastfeeding women, afterwhich follicular development, ovulation and internization were observed (49).

It is accepted by some scientists that suckling stimulates the hypothalamic secretion of Beta-endorphin, which inhibits the hypothalamic LH pulsegenerator. A study on lactating ewes showed an increase in the release of  $\beta$ -endorphin into the hypophyseal portal vessels in response to suckling (50). Plasma  $\beta$ -endorphin levels were seen to increase significantly during suckling in women (51). Some authors suggest an extrahypophyseal source of Beta-endorphin, but there is debate over whether the opiod crosses the blood/brain barrier and the meaning of finding peripheral Beta-endorphin (52).

Increased levels of prolactin are clearly associated with breastfeeding patterns (49). Inhibitory effects of prolactin on gonadotrophin secretion and/or ovarian function has been postulated. But the role of prolactin is uncertain since some lactating women show normal ovulatory cycles despite high levels of prolactin (54) and because pubatile GnRH infusion can induce follicular development and ovulation in hyperprolactinemic breastfeeding women (53). Possibly, the decline in suckling causes both the decrease in prolactin and the improvement in LH pulsation, while the relationship between prolactin and hypothalamic inhibition is only coincidental (52,55).

The current understanding of neuro-endocrinologic mechanisms relative to lactational infertility is incomplete and the complexity of the process is appreciated.

### **SUCKLING STIMULUS**

The suckling child is the stimulus that controls negative feedback inhibition of the normal cycling of HPO-axis, but accurate measurement or quantification of the suckling stimulus is difficult. Researchers have relied on measures of frequency of breastfeeding episodes, duration of each episode, total minutes of suckling and intervals between suckling episodes both during the day and at night.

A study of the recovery of ovulation during lactation in Manila and Baltimore determined that breastfeeds as a proportion of all feeds (relative frequency of breast feeding) was the best correlate of the risk of ovulation during breast feeding. Women whose first ovulation occurred before 6/12 had significantly lower percentage of breast feeds to total feeds in the first 6/12 (84% versus 88%) (56, 57).

Studies in Scotland and Denmark, showed that no woman ovulated if she breastfed her baby at least 6 times in 24 hours for a total of at least 65 minutes (58,59,60).

A study in Central Africa found that six suckling episodes per day were effective in maintaining levels of prolactin consistent with unovulation (61), but subsequent prospective studies on return of ovulation during lactation found no such minimum value of breastfeeding frequency that could be relied upon to suppress ovarian activity (62, 63, 64, 65). In these studies, some women ovulated despite upto 15 breastfeeding episodes per day (63) and a case of conception in the face of 12 breastfeeds per 24 hours has been reported (66).

Although there is no universally reliable breastfeeding frequency associated with unovulation, it is important to note that the frequency of breastfeeding remains an important determinant of lactational infertility (67,68). Indeed the frequency of breastfeeding during the day and night, and the number of minutes of suckling per feed or per day, are related to the duration of infertility.

## **SUPPLEMENTAL FEEDING**

The role of supplementation in the return of fertility is not straight forward. It is assumed that anything that decreases the child's suckling behaviour or need to suckle, secondarily causes the recovery of fertility. Supplementation may decrease hunger, thirst and the emotional need for comfort, thus reducing the suckling of the breast (30).

But in studies in developing countries, supplementation did not appear to have an impact on underlying maternal ovarian hormone profiles (Rivera R. 1991). This was thought to be due to supplements being gradual additions to the baby's diet, the breastfeeding behaviour remaining essentially unchanged.

A study in well-nourished Australian women who breastfed for an extended period of time did not find supplementation to be associated with returning fertility (15), as the supplements were gradual and in small quantities.

Supplementation has been shown to also have an effect on the duration of lactational amenorrhea, independent of breastfeeding frequency and duration (68,69).

A repetitive nature of recovery of fertility was thought to occur, the first length of amenorrhea having a significant predictive value for the subsequent length of amenorrhea. It was concluded that information on previous experience with lactational amenorrhea should be incorporated into guidelines for the introduction of family planning during lactation (70). And women can expect a similar pattern of recovery of fertility from one birth to the the next, provided the breastfeeding pattern does not change dramatically.

## **BELLAGIO CONCENSUS**

By late 1980's, researchers from 5 continents had completed prospective studies on breastfeeding women, measuring ovarian hormone levels and other physiologic parameters, in order to learn about recovery of fertility during lactation. The purpose of Bellagio conference was to determine whether the researchers' findings on women with different patterns of breastfeeding could be used to predict the recovery of fertility.

Among the studies, the highest reported pregnancy rate in fully breastfeeding, amenorrheic women during the first 6/12 postpartum was less than 2% (32,71).

Conclusions of the Bellagio consensus; Breastfeeding should be regarded as a potential family planning method in all maternal and child health programmes in developing and developed countries. Postpartum women should be offered a choice of using breastfeeding as a means of family planning, to help achieve optimal birth spacing of at least 2 years or as a way of delaying introduction of other contraceptives. They should be informed on how to maximize the anti-fertility effects of breastfeeding to prevent pregnancy. Breastfeeding provides more than 98% protection from pregnancy during the

first 6/12 postpartum if the mother is fully or nearly fully breastfeeding and has not experienced vaginal bleeding after the 56<sup>th</sup> day postpartum (71,31).

Guidelines specific to a particular country or population for using b/f as a postpartum family planning method can be developed based on Bellagio consensus. Local infant feeding practices, average duration of amenorrhea and on going changes in women's status and health practices should be considered (32).

Guidelines on how to integrate the lactational amenorrhea method (LAM) into family planning and breastfeeding support programs have been developed based on Bellagio consensus (72).

A prospective study of LAM used by 422 middle class women in Santiago, Chile found a cumulative 6/12 life table pregnancy rate of 0.45% (73).

## **SEXUALITY**

Studies done on sexuality of lactating women assumed a stable union or marriage between the woman and her male partner, that majority of lactating women are heterosexual and that libido or sexual desire is the main driving force or motivation for sexual expression.

There are certain factors that may influence sexual drive or desire during lactation; some are common situational factors unrelated to breastfeeding, others are libido-inhibiting influences related to parturation, others are libido-enhancing factors related to pregnancy, birth or lactation, other factors are related to breastfeeding woman's partner.

Libido-inhibiting influences in breastfeeding women, may be linked to low levels of either FSH, LH, estrogen and high levels of prolactin during breastfeeding. A study on parturients in New South Wales, showed breastfeeding for longer than five months to be associated with discomfort during intercourse, as well as longer periods of lactational amenorrhea. This supports the association between hormonal milieu during breastfeeding and sexual activity (74). Women who bottlefed tended to resume coitus earlier and had intercourse more frequently than breastfeeders, this further supporting a hormone-libido association (75).

Exhaustion may be the most pervasive inhibitor of sexual desire in breastfeeding women (76,77).

Emotional attachment between mother and child, correspondingly reduces emotional availability of the mother to her sexual partner. The breasts may be tender or off limits due to milk leakage, thus not available for the partner.

The likelihood of postpartum intercourse increased if the woman was younger, better educated, had other young children, lived in a nuclear household, was from urban area, had been attended by a trained health worker (78).

Researchers have studied resumption of intercourse postpartum and coital frequency. These are relatively easy to quantify, but little qualitative information about sexual behaviour during lactation is found in scientific literature.

In a postnatal clinic in England, of 328 women interviewed, 51% had resumed intercourse, most frequently during the fifth week postpartum (79).

In the Phillipines, the period with the highest probability of return to coitus was six week postpartum but 2.7% of women hadn't resumed by 2 years (78).

In Bangkok, Thailand, the mean time until the first postpartum coitus was 7.8 weeks (63). Thai study on frequency of coitus for breastfeeding women for one year postpartum indicated that after the first intercourse, average weekly frequency was about once per week.

In Chilean study, coital frequency ranged from one to six times per week in the first six months postpartum among breastfeeding women (80).

The Edinburg study measured coital frequency during weeks 12-24 postpartum, found about 1.2 times a week (pre-pregnancy frequency of 2.6 per week) (81).

## **CONTRACEPTION**

The vital complementarity between breastfeeding and family planning for the health of both the mother and child has been eloquently expressed (82).

During lactation, the choice of whether to practice contraception and if so how, requires different considerations compared with the same choice during the non-lactating state.

The array of available family planning methods has been put into a hierarchy according to their general advisability for use during breastfeeding (83). This hierarchy places non-hormonal methods as first choice, progestin only as second choice, and methods containing estrogen as a distant third, to be used only when other methods are unavailable (estrogens may reduce milk supply).

When evaluating the appropriateness of a contraceptive for use during lactation, at least three parameters must be considered;

- a) Hormonal content of the method
- b) The family planning intention, child spacing or limiting pregnancies
- c) The timing of introduction of the method

Timing of commencement of a family planning method; The double protection dilemma.

The question of when a postpartum woman should begin practicing contraception has no easy answer. A family planning provider may be tempted to give a safe response and advice FP use immediately after the baby's birth. This is indeed the view of several authorities.

For methods that do not depend on correct use by the woman or couple for long duration, like IUDs or tubal ligation, there is no need to postpone the service but for other methods like oral contraceptives, immediate use postpartum may not always be the best approach.

The natural protection from breastfeeding, characterised by lactational amenorrhea, overlaps the protection from contraception, from the time family planning begins until the time amenorrhea ends, this is the period of double protection.

In Zimbabwe in 1988, 30% of total contraceptive use overlapped with lactational amenorrhea (84). When the duration of natural infertility resulting from lactation is brief e.g. 3-6 months, there may be some benefit to double protection and it may help the couple to establish good FP habits as soon as they resume sexual relations.

There is no guesswork involved in deciding when to start practicing contraception, but medical literature about when to start contraception during lactation is scarce.

International Planned Parenthood Federation (IPPF-1990), gave two recommendations;

- a) Contraceptive measures should be used as soon as any of the risk factors, namely the first postpartum menses, introduction of supplementary milk or food to the infant and six months postpartum are realized.
- b) Couples should not take the risk of unprotected intercourse assuming wrongly that they can rely on lactational infertility (85).

Contraceptive Technology, an important clinical reference for FP in the United States suggests that; if a woman intends to breastfeed on demand and during the night, not introducing supplementary foods, she may be able to postpone introduction of an additional contraceptive method for 6-months, provided she continues breastfeeding fully both at night and day and has not resumed menses. But majority of U.S. women do not fulfil these conditions and US clinicians should caution clients against relying on breastfeeding alone for contraception (86).

In Zimbabwe, the average duration of lactational amenorrhea in 1988 was 12 ½ months (84). This contrasts with the women in the U.S., who breastfeed and experience amenorrhea for much shorter periods.

Between 1987 and 1988, only 56% of all U.S. mothers ever breastfed, with only a small proportion still breastfeeding, at least once a day, after six months (87).



## **PROBLEM STATEMENT:**

It was noted in the 1940's, that the prevalence of breastfeeding was high in nearly all societies, then later the feeding of infants on manufactured milk started from the west, then slowly spread to the developing countries. This coincided with the economic factors, which led to rural - urban migration, (1,2)

During 1970s, the prevalence of breastfeeding started to rise again, starting with the high socio-economic groups, then leveled off in the 1980's, then steadily fell again (2, 88)

In Kenya, the decrease in median duration during the 1980s occurred in a broad range of socio-economic and educational levels. Majority of children in Kenya were given food supplements before 4 months of age. Mothers in Kenya perceive breastfeeding as a process, something that mothers and infants do and not solely as food for the infant (8, 9)

In other developing countries, there was a decline in breast-feeding, particularly in urban areas and in certain regions like Latin America. But one would also find countries where breast-feeding had not changed or where it had actually increased. (1,89,90)

It was realized that breastfeeding was of great significance to human welfare, breast milk providing ideal food for most infants, protection from infection, saving family money and country's foreign exchange, contributing to mother-child bonding, reducing allergic diseases and breastfeeding conferring a significant amount of child-spacing in the months after the baby's birth especially if the mother has not resumed regular menstrual cycles and is fully breastfeeding.

In developing countries, the infertility associated breast feeding is a major factor in child spacing and family size reducing since modern family planning methods are not commonly used in these countries either due to unavailability, cultural or personal beliefs (2)

Following the declining trends in breast-feeding and on noting the benefits of breast-feeding for both the mother and infant, WHO in 1981 recommended that breast feeding should be promoted actively with education programmes being directed towards mothers, their families and health professionals and steps should be taken to inhibit advertising and promotion of breast milk substitutes (91)

In many countries, many hospital practices were implicated in undermining breastfeeding and some recommendations were made in order to promote breastfeeding. These were such like minimizing obstetric medication, encouraging breastfeeding immediately after birth, keeping mother/child pair together during hospital stay, placing no restrictions on frequency and duration of breastfeeding, avoiding routine bottle supplements of water or manufactured infant milk before breastfeeding is established, not to advertise artificial baby milk, enhancing positive attitudes among all staff towards breastfeeding.

The situation at KNH by late 1980's, was that bottles were no longer used even for low birth weight infants, instead expressed breast milk was given by cup and spoon, and mothers with babies in newborn unit were housed within the hospital premises (2). In 1993, the director of medical services started the National policy on infant feeding in Kenya, with assistance from UNICEF.

By 1999, at KNH, various levels of health personnel including obstetricians, pediatricians, postgraduate doctors, midwives, pediatric nurses and nutritionists were still being trained to promote and support breastfeeding, but the impact of this on breast-feeding patterns and fertility has not yet been evaluated.

At clinic 66, KNH, where family planning services are offered, breast feeding mothers are traditionally started on a method of contraceptive at six weeks after delivery even if they are fully breast feeding and amenorrheic. Any mother who fails to start a contraceptive method at this time is advised to await her menses, and then come for a method while on menses. This subjects the mothers to a period of uncertainty and indeed some of them may be seen in antenatal clinic before their menses resume. Alternatively the mother who comes for family planning method, more than six weeks after delivery may be advised to utilize less effective methods like condoms until her menses resume. Or if she could come with a negative pregnancy test result, then a contraceptive method can be commenced at any time after delivery. Could these breast-feeding mothers be educated on the criteria for lactation method of contraceptive? How applicable is this method of contraceptive in our set up?

It will be the aim of this study to see how these promotion/support programmes have influenced the patterns of breastfeeding and contraception.

And to find out how lactation amenorrhea method of contraception is being utilized in our set-up if at all its being utilized.

Recommendations will be made on how best to utilize the Lactation amenorrhea method to save the time and money spent by governments and institutions on contraceptives for amenorrheic, breast feeding mother for the first six months after delivery.

## **OBJECTIVES:**

### **GENERAL OBJECTIVES:**

To conduct a cross-sectional survey on breastfeeding patterns, resumption of menstruation and contraceptive use among family planning and MCH clients at KNH, and to study the utilization of lactation amenorhea method in this population, over a 6-month period in the year 2001.

### **SPECIFIC OBJECTIVES:**

- 1.) To determine the prevalence, average duration, frequency and intensity of breastfeeding and timing of supplements in this population of mothers with children under three years of age attending these clinics.
- 2.) To determine the average duration of amenorhea in this population.
- 3.) To determine the average duration of post-partum sexual abstinence and frequency of sexual contact in this population.
- 4.) To determine the prevalence and types of contraceptives used in this population.

## **STUDY METHODOLOGY**

### **STUDY DESIGN**

It was a cross-sectional study done over a 6-month period in the year 2001.

### **STUDY AREA**

The study was conducted at Kenyatta National Hospital (KNH) in the family planning and maternal child health (MCH) clinics, also referred to as clinic 66 and clinic 20 respectively. KNH is a teaching and referral hospital, situated about 3 Km from the city centre of Nairobi. Services at both clinic 66 and 20 are free of charge and the clinics serve the estates surrounding Nairobi city. These two clinics open from Monday to Friday between eight in the morning and five in the evening.

In clinic 20, an average of 36 clients are seen per day, these are usually children of less than five years accompanied by their mothers or guardians. About 4 nurses and two clerks are in attendance every day. The services offered in this clinic include immunization, growth-monitoring, health education and identification of children requiring referral to the pediatrician or nutritionist.

In clinic 66, an average of 79 clients are seen per day, these are usually women seeking family planning services and include some breast-feeding mothers too. About 9 nurses and 2 clerks are in attendance every day. The services offered in this clinic include health education, provision of all types of contraceptives including surgical contraceptive, diagnostic laparoscopy, a clinician is also in attendance to review those clients with complications of contraceptive use. Screening procedures like pap-smear are also done.

### **STUDY POPULATION**

These were women whose last delivery was 0-3 years, attending these two clinics over the study period, and who gave consent to participate in the study.

The recruitment was in clinic 66 and 20 from Monday to Friday between 8.00 a.m. and 1.00 p.m. At recruitment, the clients were informed of the intended study and their consent to participate sought. A screening questionnaire was used to identify mothers with children under three years. Out of 412 clients screened, 363 had children aged 3 years or less. For the 363 with children under 3 years, a pre-tested questionnaire was administered by the investigator or other trained health personnel.

### **INCLUSION CRITERIA**

- 1) Mothers whose last delivery was 0-3 years ago.
- 2) Mothers with prior breast-feeding experience, who had breastfed another child before.
- 3) Mothers who had given verbal consent to participate in the study.

### **EXCLUSION CRITERIA**

- 1) Mothers of babies who had problems likely to deter breast-feeding like cleft lip or palate.
- 2) Mothers with more than one child/infant, even if their delivery was less than 3 years ago.

- 3) Mothers with no previous breast-feeding experience.
- 4) Mothers not willing to participate in the study.

**LIMITATION OF STUDY**

Memory bias was encountered.  
 Most of the mothers were coming for family planning services.  
 Most mothers sent their children to the MCH clinic with other relatives.

**SAMPLE SIZE**

$$n = \frac{z^2 pq}{d^2}$$

- p = is the estimated prevalence of breastfeeding
- d = confidence interval, taken to be 0.05
- z = value corresponding to desired confidence interval taken as 1.96
- q = 1 - P
- p will be taken as 68%, WHO 1989a, found a prevalence rate of between 53 – 86% in Africa at 12 months. Averaging to 68% (11).

Thus

$$n = \frac{(1.96)^2 (.68) (.32)}{(0.05)^2} = 334.37284$$

Thus 334 - 350 breastfeeding women will be interviewed.

**SAMPLING METHOD AND QUESTIONNAIRE ADMINISTRATION.**

First the breast-feeding mothers with children under 3 years were selected using a screening questionnaire. Then every third breast-feeding mother who satisfied the inclusion criteria was recruited. When one of the mothers declined inclusion into the study, the next mother who satisfied the inclusion criteria was excluded. At recruitment the mothers were assigned study numbers. A prior tested (pre-tested) questionnaire was then administered by the researcher or four of the research assistants who were nursing staffs at the clinics of study. The research assistants had been trained for 2 weeks and the validity of data collected was constantly checked by the researcher.

**DATA MANAGEMENT**

Data obtained from this study was analyzed and presented using tables, barcharts, and pie charts.  
 The programme used for the analysis was the Statistical Package for Social Sciences (SPSS).

## **ETHICAL CONSIDERATION**

- Informed Consent was obtained from those willing to participate in the study.
- Service was not denied to those who declined to participate in the study.
- A copy of the proposal was forwarded to the ethical committee at KNH for approval.
- Education was not denied for those who declined participation.
- Sick mothers were treated and referred accordingly.
- Confidentiality was assured by using study numbers rather than patients names.

## **RESULTS:**

A total of 363 breastfeeding mothers were recruited into the study. Table 1-15 and figure 1-7 describes their demographic characteristics, their breastfeeding and infant feeding patterns, their family planning utilization, their resumption of sexual contact and menstruation.

The general characteristics of these populations are presented in Table 1 and 2 (N=363).

**Table 1: Demographic characteristics**

<b>Demographic characteristics</b>	<b>Mean ± 1SD</b>	<b>N</b>	<b>%</b>
Maternal Age (Years)	27.6±1.4	-	-
Age of Index child (Months)	7.8±0.4	-	-
Parity	3.0±0.2	-	-
Occupation of mother:			
House Wife	-	160	44.1
Informal sector	-	128	35.3
Formal sector	-	74	20.1
None	-	1	0.3
Level of Education:			
Primary	-	136	37.5
Secondary	-	213	58.7
Post secondary	-	9	2.4
None	-	5	1.4
Residence:			
Nairobi	-	313	86.2
Outside Nairobi	-	50	13.8

**Table 2: Age of Mother (maternal age distribution)**

<b>Age group</b>	<b>No. of mothers</b>	<b>%</b>
< 20	18	5
21 –30	261	71.9
31 – 40	82	22.6
> 41	2	0.6
Total	363	100

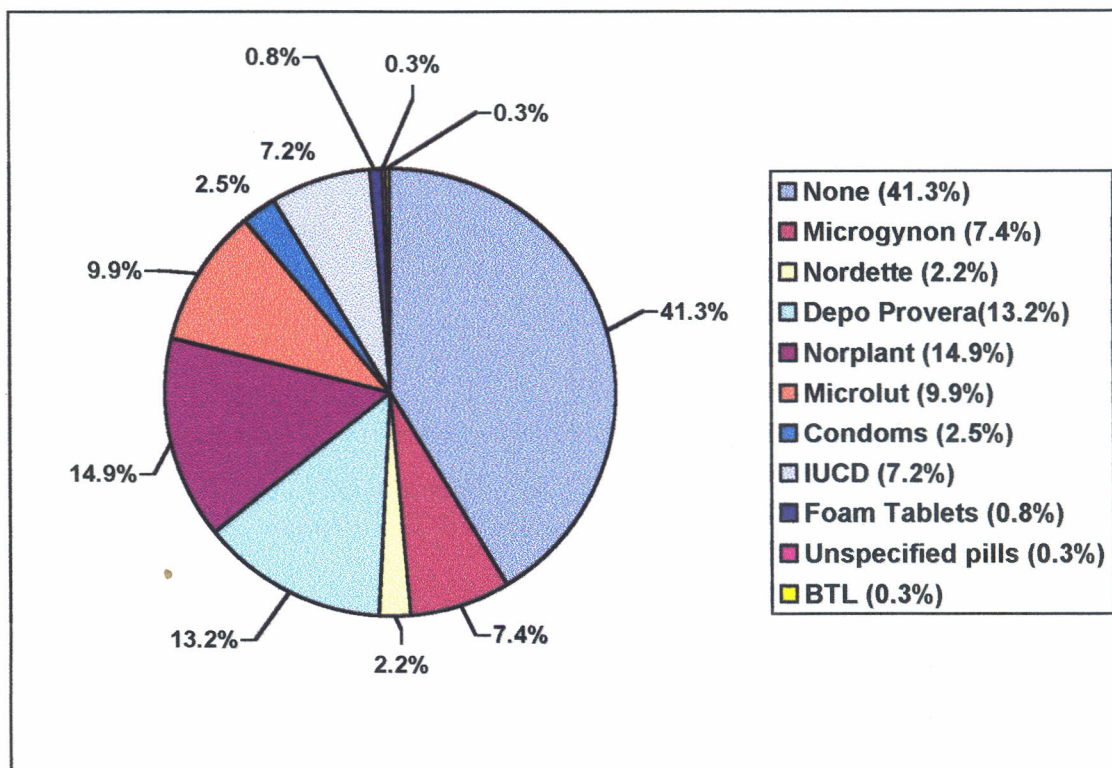
On average, the mothers were 27.6+/- 1.4 years of age, 94.5% of them aged 21 – 40 years. 58.7% of them had gone up to secondary level of education. Only 1.4% of them had not had any formal education. Majority, 79.4% were either housewives or working in the informal sector (table 1 and 2).

Their parity ranged from 2 – 7, with a mean of 3.0 +/- 0.2 (table 1).

58.7% of mothers interviewed were using some form of contraception at the time of study. 28.1% of them were using Depo-Provera or Norplant and there was a notable low utilization of IUCD at 7.2% (figure 1).

41.3% of the mothers had not started any form of contraceptive and were coming to start a method (Figure1).

**Fig. 1: Family planning methods used**



**Previous breastfeeding experience**

The prior child was breastfed for a mean duration of 18.9 +/- 0.9 months, with 78% of mothers having breastfed their prior child for 11 – 30 months (table 3 and 5).

In these mothers, postpartum amenorrhoea lasted 47.9 +/- 2.4 weeks (11.9 months). 27.5% of the mothers indicated that they stopped breastfeeding because a pregnancy occurred. The second commonest reason was baby’s refusal of solid food in 23.1% of mothers. 21.2% of the mothers indicated that the children refused to suck by themselves (Table 3).



**Table 3: Previous breastfeeding experience**

Features	Mean ± 1SD	N	%
No. of months the prior child was breastfed	18.9±0.9	-	-
First postpartum menses in weeks	47.9±2.4	-	-
Reason for discontinuing breastfeeding:			
. Pregnancy	-	100	27.5
. Refusal of solid food	-	84	23.1
. Refusal to suck	-	77	21.2
. Child became of age	-	32	8.8
. Separation	-	30	8.3
. Mother sick	-	10	2.8
. Insufficient milk	-	6	1.7
. Sore breast	-	5	1.4
. Child a bother	-	4	1.1
. Child fell sick	-	4	1.1
. Baby died	-	4	1.1
. No reason	-	4	1.1
. Others	-	3	0.8

Majority of mothers (77.7%) breastfed their prior infants for less than 8 times during the day. While at night, majority (90.9%) breastfed their prior infants for less than 8 times (Table 4).

**Table 4: Number of times prior child was breastfed during the day and night**

Number of times	DAY		NIGHT	
	No. of children	%	No. of children	%
< 4	148	40.8	253	69.7
5-8	134	36.9	77	21.2
9-12	30	8.3	8	2.2
13+	50	13.8	23	6.3
Not indicated	1	0.3	2	0.6
Total	363	100	363	100

**Table 5: Length of time the prior child was breastfed.**

Length of time (Months)	Number of children	%
< 10	55	15.2
11-20	172	47.4
21-30	111	30.6
31-40	16	4.4
41+	9	2.5
Total	363	100

## Current Breastfeeding Experience

Table 6 shows that in mothers with children under six months of age, the frequency breastfeeding is fairly low, with 19.6% indicating a frequency of 5 – 8 times during their waking hours. The frequency then decreases to less than 4 times at the end of the first year for majority (12.4%) of the mothers. The frequency of breastfeeding after the first year was relatively low, with 60% of the mothers having 4 or less episodes of breastfeeding per day.

The frequency of breastfeeding by day decreased with increasing age of the index child. In overall, majority (40.6%) were breastfeeding less than 4 times during the day. Followed by 32.6% who were breastfeeding between 5 – 8 times during the day (Table 6).

**Table 6: Frequency of breastfeeding per day by age of index child**

Breastfeeding episodes per day	Age of index child (Months)									
	<6		7-12		13-18		19+		Total	
	N=19 2	%	N=88	%	N=49	%	N=34	%	N=363	%
< 4	48	13.3	45	12.4	31	8.6	23	6.4	147	40.5
5-8	71	19.6	26	7.2	10	2.8	11	3.0	118	32.5
9-12	33	9.1	7	1.9	3	0.8	-	-	43	11.8
13+	40	11.0	10	2.8	5	1.4	-	-	55	15.2

P=0.00000

The frequency of breastfeeding by night also decreased with increasing age of the index child. In overall, majority (73.3%) were breastfeeding less than 4 times during the night, while 17.6% were breastfeeding between 5 – 8 times during the night (Table 7).

**Table 7: Frequency of breastfeeding per night by age of index child**

Breastfeeding Episodes per night	Age of index child (Months)									
	<6		7-12		13-18		19+		Total	
	N=193	%	N=88	%	N=48	%	N=34	%	N=363	%
<4	137	37.7	62	17.1	40	11.0	27	7.4	266	73.3
5-8	37	10.2	15	4.1	7	1.9	5	1.4	64	17.6
9-12	9	2.5	3	0.8	-	-	-	-	12	3.3
13+	10	2.8	8	2.2	1	0.3	2	0.65	21	5.8

P=0.48692

Majority of mothers (47.5%) has started the index child on drinks before 3 months of age, followed by 24.5% who had started them on drinks at 3.5 – 6 months of age. (Table 8).

**Table 8: Age the index child was started on Drinks and Foods**

Age group (Months)	DRINKS		FOODS	
	No. of Children	%	No. of Children	%
< 3	172	47.4	63	17.4
3.5 – 6	90	24.8	143	39.4
6.5 – 8	3	0.8	5	1.4
> 8	0	0	6	1.7
Not yet	98	27.0	146	40.2
Total	363	100	363	100

Majority of mothers, 56.8% had started the index child on solid foods before 6 months of age. The mean age at introduction of drinks was 2.3 +/- 0.11 months (+/- 1 SD). The mean age at introduction of solid foods was 2.5 +/- 0.13 months (+/- 1 SD) (Table 8).

**Table 9: Age of index child not yet started on drinks and solid food (in weeks)**

Age (weeks)	N(%) not started on drinks alone	N(%) not started on foods alone	N(%) not started both drinks and food
0-2	-	-	2(2.17%)
2-4	-	2(3.9%)	4(4.35%)
4-6	1(20%)	8(15.7%)	51(55.4%)
6-8	1(20%)	9(17.6%)	19(20.7%)
8-10	2(40%)	2(3.9%)	4(4.35%)
10-12	-	19(37.3%)	10(10.9%)
12-14	-	1(1.96%)	-
14-16	-	5(9.8%)	1(1.1%)
16-18	-	2(3.9%)	-
18-20	-	2(3.9%)	-
20-22	-	-	-
22-24	1(20%)	1(1.96%)	1(1.1%)
Total	5	51	92

188 out of 363 mothers interviewed (51.8%) had children less than 6 months or 24 weeks old. 40 out of 188(21.3%) had started their infants on both drink and food by 6 months of age. 92 out 188(48.9%) had not started their infants on drinks or solid food by 6 months (24 weeks) of age. 51(55.4%) of those who had not started on any foods or drinks had infants aged 4-6 weeks and only 2(2.2%) were aged more than 12 weeks and less than 24 weeks had not been started on food and drink. In conclusion majority (97.8%) who had not started their infants on drinks or foods, had infants less or equal to 12 weeks (3 months) (Table 9).

Only 5 out of 188(2.7%) of mothers with infants under 24 weeks (6 months) had not started their infants on drinks (Table 9).

Only 51 out 188(27.1%) of mothers with infants under 24 weeks (6 months) had not started their infants on solid foods (Table 9).

**Resumption of Sex after delivery of index child and the frequency of sexual contact thereafter.**

Majority of mothers 291 (80.2%) had resumed sexual intercourse before 20 weeks (5 months), with majority 240 (66.1%) of them having sexual contact at a rate of less than 3 times per week after resumption and 44 (12.1 %) of them having sexual contact at a rate of 3-6 times per week (Table 10). The earliest time for resumption of sexual intercourse was one week.

**Table 10: Resumption of sex by number of times mother had sex per week**

Resumption of sex (weeks)	Number of times mother had sex per week				Total
	<3	3-6	7-10	None	
< 20	240(66.1%)	44(12.1%)	7(1.9%)	-	291(80.2%)
21 – 40	9(2.5%)	-	1(0.3%)	-	10(2.8%)
41 – 60	1(1.3%)	-	-	-	1(0.3%)
61 +	1(0.3%)	1(0.3%)	-	-	2(0.6%)
Not yet	-	1(0.3%)	-	57(15.7%)	58(16.0%)
Total	251(69.3%)	46(12.7%)	8(2.2%)	57(15.7%)	362(100%)

**P=0.00000**

**Table 11: Contraceptives used by those at less than 6 months and who had not resumed menses.**

<u>Method</u>	<u>N(%)</u>
None	89(79.5%)
Microlut	11(9.8%)
Depo provera	7(6.3%)
Norplant	3(2.7%)
BTL	1(0.9%)
Condoms	2(1.8%)

112 of the 188 women at less than 6 months postpartum had not resumed menstruation, 30.9% of the total study population and 59.6% of those women studied were less than 6 months postpartum.

89(79.5%) of them were using no method at all and at the time of interview they were coming for initiation of a method (Table 11).

11(9.8%) were using Microlut, 7(6.3%) were using Depo-Provera injection, 3(2.7%) were using Norplant implants, 2(1.8%) were using condoms and 1(0.9%) had had BTL done for family planning (Table 11).

### Menstrual Resumption

By 6 months post delivery, 20.9% of mothers had resumed menstruation and by 12 months post delivery 42.7% of mothers had resumed menstruation (Table 12) (cumulative percentage for the less than 6 month group and the 7-12 month group).

Table 12: Distribution of breastfeeding mothers by menstruation status and age of index child

Menstrual status	Age of index child							
	< 6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Return to Menstruation	76	20.9	79	21.8	73	20.1	228	62.8
Not returned to menstruation	112	30.8	14	3.9	9	2.5	135	37.2
Total	188	53.2	93	25.7	82	22.6	363	100

P=0.00000

Majority of those who had resumed menstruation had done so at 5 – 10 weeks postpartum 70(30.8%), followed by 44(19.7%), who had resumed menstruation before or at 4 weeks (Table 13).

Of the 44 (19.4%) of the mothers who resumed menstruation at less than 4 weeks, majority 25 (11.0%) were breast feeding their infants for less than 4 times during the waking hours. The percentage of those resuming menses at less than 4 weeks decreased with increasing frequency of breast feeding during the waking hours (Table 13).

Of those 70 (30.8%) who resumed menstruation at 5-10 weeks, majority 33 (14.5%) were breast feeding their infants for less than 4 times during the waking hours (Table 13). The percentage of those resuming menses at 5-10 weeks decreased with increasing frequency of breast feeding during the waking hours (Table 13).

The resumption of menses after 10 weeks did not appear to be related to the frequency of breast-feeding during the waking hours. A pattern similar to that observed in those who resumed menses at less than 4 weeks and 5-10 weeks range was not observed (Table 13).

**Table 13: Mothers who have resumed menstruation after delivery of index child by frequency of breastfeeding by day.**

Resumption of menstruation (weeks)	Frequency of breastfeeding by day				Total
	< 4	5-8	9-12	13+	
<4	25(11.0%)	8(3.5%)	3(1.3%)	8(3.5%)	44(19.4%)
5-10	33(14.5%)	22(9.7%)	7(3.1%)	8(3.5%)	70(30.8%)
11-15	5(2.2%)	10(4.4%)	3(1.3%)	4(1.8%)	22(9.7%)
16-20	9(4.0%)	13(5.7%)	-	-	22(9.7%)
21-25	6(2.6%)	8(3.5%)	2(0.9%)	1(0.4%)	17(7.5%)
26-30	9(4.0%)	-	1(0.4%)	-	10(4.4%)
31-35	2(0.9%)	2(0.9%)	-	2(0.9%)	6(2.6%)
36-40	7(3.1%)	4(1.8%)	-	1(0.4%)	12(5.3%)
>40	9(4.0%)	-	2(0.9%)	4(1.8%)	15(6.6%)
Not indicated	6(2.6%)	3(1.3%)	-	-	9(4.0%)
<b>Total</b>	<b>111(48.9%)</b>	<b>70(30.8%)</b>	<b>18(7.9%)</b>	<b>28(12.3%)</b>	<b>227(100%)</b>

P=0.01058

Of the 44 (19.4%) who resumed menstruation at less than 4 weeks, majority 35 (15.4%) were breast feeding their infants for less than 4 times during the night (table 14). The percentage of those resuming menses at less than 4 weeks decreased with increasing frequency of breast feeding during the night (table 14).

Of the 70 (30.8%) who had resumed menstruation at 5-10 weeks, majority 53 (23.3%) were breast feeding their infants for less than 4 times during the night. The percentage of those resuming menses at 5-10 weeks decreased with increasing frequency of breast-feeding at night (table 14).

This pattern was also noted to occur even after 10 weeks. There seems to be a correlation between early resumption of menstruation and reduced frequency of breastfeeding.

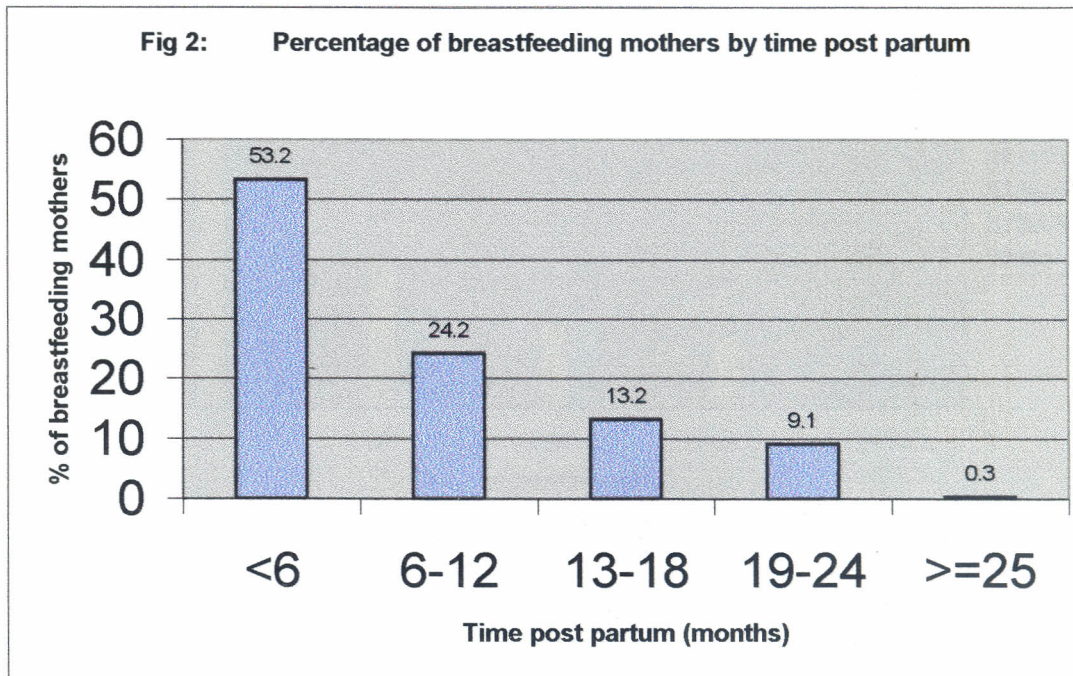
**Table 14: Mothers who have resumed menstruation after delivery of index child by frequency of breastfeeding by night.**

Resumption of menstruation (weeks)	Frequency of breastfeeding by night				Total
	< 4	5-8	9-12	13+	
<4	35(15.4%)	7(3.1%)	-	2(0.9%)	44(19.4%)
5-10	53(23.3%)	12(5.3%)	1(0.4%)	4(1.8%)	70(30.8%)
11-15	18(7.9%)	1(0.4%)	-	3(1.3%)	22(9.7%)
16-20	14(6.2%)	6(2.6%)	-	2(0.9%)	22(9.7%)
21-25	12(5.3%)	4(1.8%)	1(0.4%)	-	17(7.5%)
26-30	7(3.1%)	1(0.4%)	1(0.4%)	1(0.4%)	10(4.4%)
31-35	5(2.2%)	1(0.4%)	-	-	6(2.6%)
36-40	11(4.8%)	1(0.4%)	-	-	12(5.3%)
>40	11(4.8%)	4(1.8%)	-	-	15(6.6%)
Not indicated	8(3.5%)	1(0.4%)	-	-	9(4.0%)
<b>Total</b>	<b>174(76.7%)</b>	<b>38(16.7%)</b>	<b>3(1.3%)</b>	<b>12(5.3%)</b>	<b>227(100%)</b>

P=0.61767

**Duration of breastfeeding of the index child**

Fig 2 shows the proportion of mothers breastfeeding at the time of interview by age of the index child. At less than 6 months, 53.2% were still breastfeeding and at 6 – 12 months 24.2% were still breastfeeding. It was notable that by 19-24 months, the percentage of those still breastfeeding was low (9.1%) (figure 2).



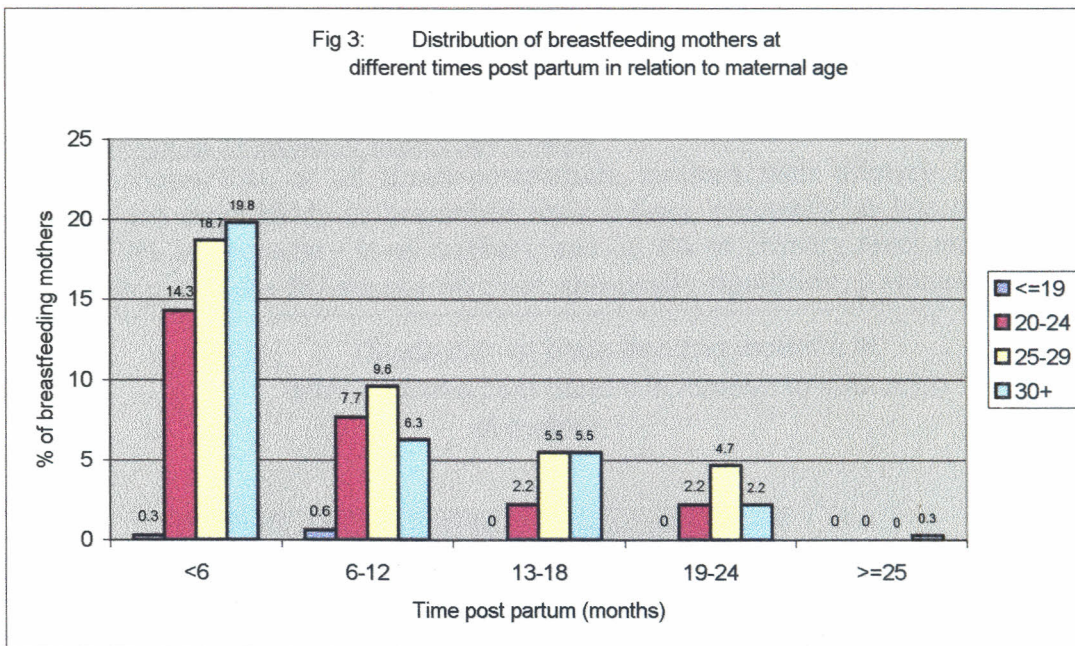
### **Breastfeeding patterns of index child in relation to Maternal Age.**

Fig 3 shows that mothers aged 19 years or less ( $\leq 19$  years) were less likely to breastfeed even for 6 months, with 0.3% breastfeeding infants for less than 6 months and 0.6% breastfeeding infants between 6-12 months (figure 3).

Among mothers aged 20-24 years, 14.3% breastfed for <6 months, 7.7% breastfed their infants for 6-12 months, 2.2% breastfed their infants for 13-18 months and 2.2% breastfed their infants for 19-24 months (figure 3).

Among mothers aged 25-29 years, 18.7% breastfed their infants for <6 months, 9.6% breastfed their infants for 6-12 months, 5.5% breastfed their infants for 13-18 months and 4.7% of them breastfed their infants for 19-24 months. Mothers in this group were more likely to breastfeed their infants at all times postpartum, but the differences were not statistically significant, p value was 0.549 (figure 3).

Among mothers aged over 30 years, 19.8% breastfed their infants for <6 months, 6.3% breastfed their infants for 6-12 months, 5.5% breastfed their infants for 13-18 months, 2.2% breastfed their infants for 19-24 months and 0.3% breastfed their infants for 25 months (figure 3).

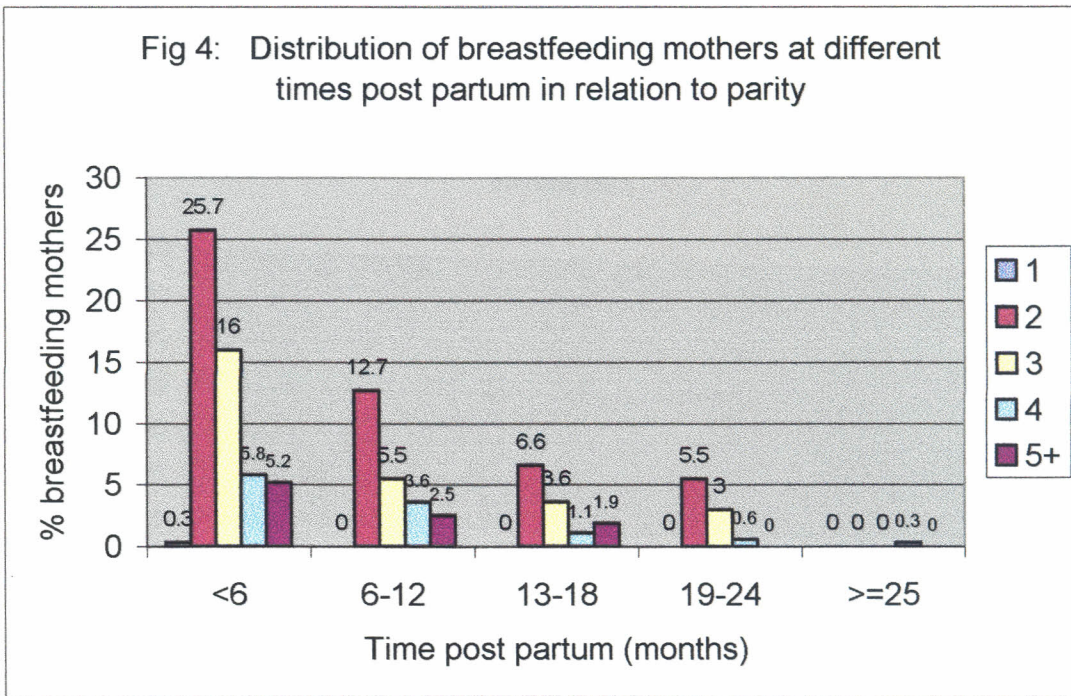


### **Breastfeeding of index child in relation to parity**

In Fig. 4, the proportion of breastfeeding mothers at 6 months varies with parity. This variation is also seen at other times postpartum. In the overall, mothers who are para 2, are more likely to breastfeed at all times postpartum, with 25.7% breastfeeding at 6

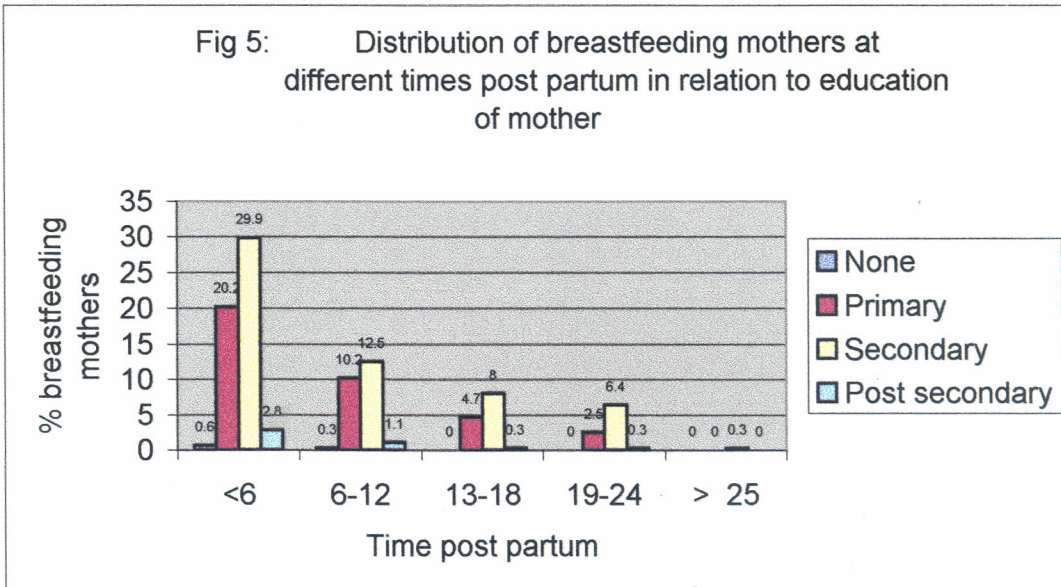


months and 12.7% breastfeeding at 6 – 12 months postpartum, but the difference was not statistically significant, p value was 0.393 (figure 4).



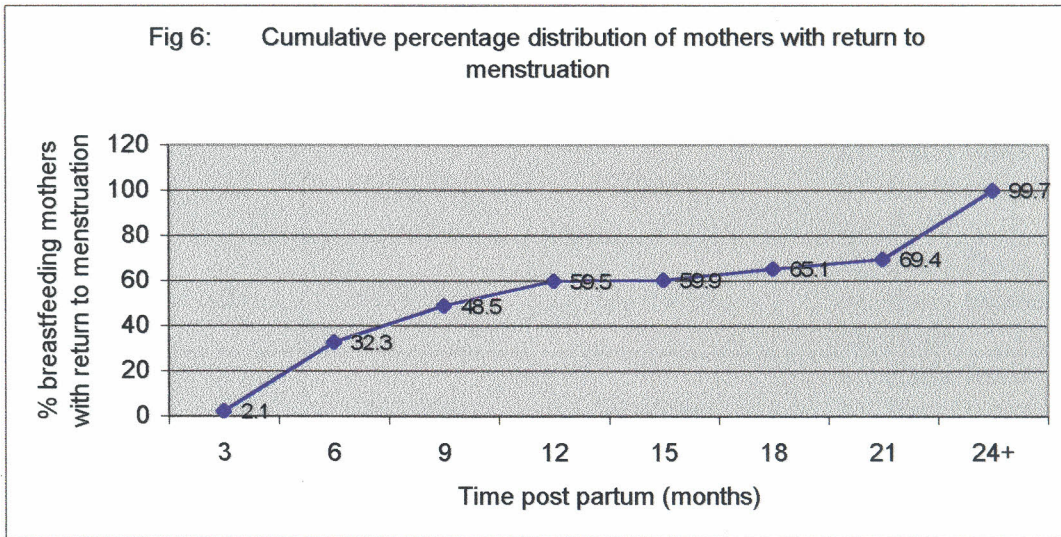
**Breastfeeding in relation to education status**

Figure 5 shows that, at all times postpartum, mothers with primary and secondary education are more likely to breastfeed their infants, especially at less than 6 months where 29.9% of secondary level mothers, and 20.2% of primary level mothers are still breastfeeding. But the differences were not statistically significant, p value 0.963.



## Return of menstruation after delivery of the index child

Figure 6 shows a distribution of mothers who were menstruating at various ages postpartum. At 3 months, only 2.1% of mothers were menstruating, this proportion was 32.3% at 6 months postpartum. At 9 months, 48.5% of mothers were menstruating and 59.5% were menstruating at 12 months. At 24 months, 99.7% were menstruating already.



**Table 15: Percentages of those satisfying LAM per time postpartum (weeks)**

Age of baby (weeks)	N=188	% Satisfying LAM	% Not satisfying LAM	Reason for not satisfying LAM
0-2	2	2(1.1%)	-	=
2-4	6	5(2.7%)	1(0.5%)	a) Early feeds - 1(0.5%) b) Early menses - - c) Both - -
4-6	62	45(23.9%)	17(9.0%)	a) Early feeds - 9(4.8%) b) Early menses - 8(4.3%) c) Both - -
6-8	29	15(8.0%)	14(7.4%)	a) Early feeds - 8(4.3%) b) Early menses - 3(1.6%) c) Both - 3(1.6%)
8-10	10	1(0.5%)	9(4.8%)	a) Early feeds - 3(1.6%) b) Early menses - 2(1.1%) c) Both - 4(2.1%)
10-12	36	1(0.5%)	35(18.6%)	a) Early feeds - 8(4.3%) b) Early menses - 8(4.3%) c) Both - 19(10.0%)
12-14	2	-	2(1.1%)	a) Early feeds - 1(0.5%) b) Early menses - c) Both - 1(0.5%)
14-16	12	-	12(6.4%)	a) Early feeds - 4(2.1%) b) Early menses - c) Both - 8(4.3%)
16-18	4	-	4(2.1%)	a) Early feeds - 2(1.1%) d) Early menses - c) Both - 2(1.1%)
18-20	11	-	11(5.9%)	a) Early feeds - 4(2.1%) b) Early menses - c) Both - 7(3.7%)
20-22	1	-	1(0.5%)	a) Early feeds - - b) Early menses - - c) Both - 1(0.5%)
22-24	13	-	13(6.9%)	a) Early feeds - 4(2.1%) b) Early menses - 2(1.1%) c) Both - 7(3.7%)
Total	100%	36.7%	63.3%	a) Early feeds - 44(23.4%) b) Early menses - 23(12.2%) c) Both - 52(27.7%)

188 out of 363 mothers (51.8%) had children less than 6 months or 24 weeks old. 69 out of 188 (36.7%) satisfied Lactational Amenorrhoea Method (LAM) criteria, while 119 out of 188 mothers (63.3%) did not satisfy the LAM criteria (table 15).

44(23.4%) of those who did not satisfy the LAM criteria had started early feeds on their infants (table 15).

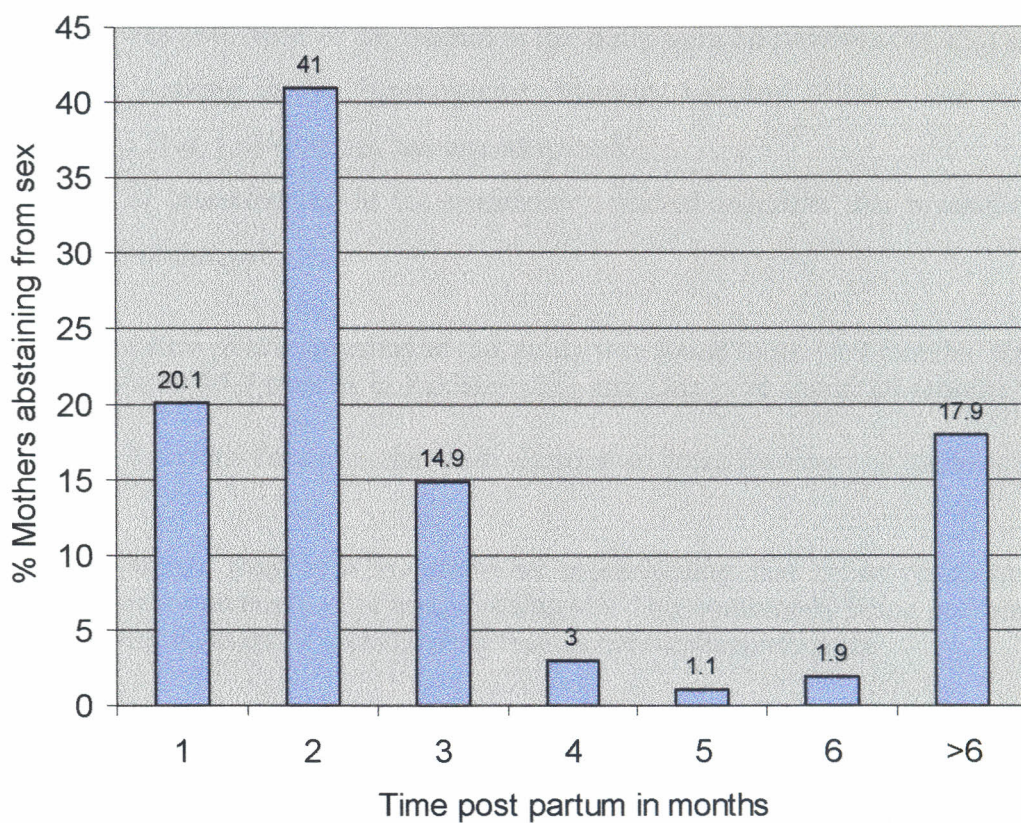
23(12.2%) of those who did not satisfy the LAM criteria had resumed their menses early (table 15).

52(27.7%) of those who did not satisfy LAM criteria had started giving their infants feeds early as well as resuming their menses early (table 15).

### **Distributing of mothers abstaining from sex at different times postpartum.**

Fig. 7 shows percentage distribution of mothers still abstaining from sexual intercourse at various times postpartum. Generally the pattern indicates a short duration of postpartum sexual abstinence. At 3 months, only 14.9% of the study population were still abstaining and by the end of six months postpartum, only 1.9% of them were still abstaining (figure 7).

Fig 7: Distribution of mothers abstaining from sex at different times post partum



## DISCUSSION

The mean age of the breast feeding mothers studied was 27.6 years, 94.5% of them were aged 21-40 years. The mean age of the index child in this study was 7.8 months. The mean parity was 3+0. Most of the women in the study were housewives (44.1%) and only 20.1% were working in the formal sector. Majority had had primary and secondary education (96.2%), 1.4% had not had any education.

The pattern of breastfeeding in the community studied indicates that breastfeeding is universal and prolonged.

The mean duration of breastfeeding in this study was found to be 18.9 months. Khan and co-workers found 16.8 months in Pakistan (66) and Don et al found 20 months in rural Kenya (92).

In a study in Northern Tanzania, the mean duration of breastfeeding was found to be 21.5 (93).

It has been shown from a WHO study on breastfeeding that urban residence has a negative influence on duration of breastfeeding (1). This community being predominantly urban has lower duration of breastfeeding than in the rural counterparts.

Education status, age and parity of the mother have been shown independently to influence the breastfeeding duration in some studies (94,95), while other studies have not shown this association (92,93). In this study, mothers aged 25-29 years were more likely to breastfeed their infants, while mothers aged 19 years or less were least likely to breastfeed their infants even for 6 months. Also it was found that the proportion of breastfeeding mothers at all times postpartum varied with parity and mothers who were para 2 were more likely to breastfeed their infants at all times postpartum. It was also found in this study that at all times postpartum, mothers with primary and secondary level of education were more likely to breastfeed their infants.

Both breastfeeding frequency and intensity operate jointly to inhibit ovulation, which suggests that total nipple stimulation is important for maintenance of lactational infertility. Studies which have looked at the direct effect of frequency of breastfeeding on ovulation tends to suggest that a minimum number of breastfeeding episodes such as 10 per day, lasting for 5 minutes under 6 months or 15 per day lasting 10 minutes after six months might be required to suppress ovarian activity. In this study, low frequencies of breastfeeding were prominent before 6 months, with 51% of the mothers reporting less than 8 episodes of breastfeeding per day (both night and day combined). The frequency of breastfeeding however declined after 6 months with majority of mothers reporting less than 8 episodes per day. These findings agree with those reported from other studies (1,16,36,66). At birth, the prevalence of breast-feeding was unknown in this study population, at 6 months the prevalence of breastfeeding was 53.2%, while at 6-12 months it was 24.2%. The prevalence continued to decline and at 19-24 months it was 9.1%. The

prevalence of breastfeeding at birth was reported in the 2001 Population Reference Bureau to be 98% in Kenya (96).

Unlike in other studies, mothers in this study tended to introduce supplements early. 172 (47.4%) had started their children on drinks before 3 months and 63 (17.4%) of them had started their children on solid foods before 3 months and 143(39.4%) of them had started their children on solid foods by 3.5-6 months of age (1,66). And this early introduction of drinks and foods is followed by the decline in the frequency and intensity of breastfeeding. The mean age at introduction of drinks was 2.3 +/- 0.11 months, while that at introduction of food was 2.5+/-0.13 months in this study.

It has been suggested by MacNeilly et al (58) that the total duration of suckling per day becomes more important as suckling frequency declines. The duration of suckling in this study could not be directly determined as it was not possible to quantify. The general observation was that the child was breastfed until he/she was satisfied and this is more likely to depend on child's feeding behavior and age.

One longitudinal study (56) suggested that when menstruation occurred or if breastfeeding was continued beyond six months, the risk of ovulation was much higher unless women breastfed more than 10 times per day. Findings in this study indicates that 20.9% of mothers had returned to menstruation at 6 months and at the same time the proportion of mothers breastfeeding for more than 10 episodes per day were about 27%.

Observation from other rural communities (97) shows that breastfeeding seems to have greater contraceptive effectiveness in rural women. A more physically demanding lifestyle and perhaps compromised maternal nutrition have been offered as possible explanations for the greater contraceptive effectiveness of breastfeeding among rural women.

This might not hold for the urban community under study, where contraceptive effectiveness of breastfeeding was low, as the infants tended to be given feeds early. In this study only 36.7% of mothers were satisfying the lactational amenorrhoea method criteria, and could utilize this as a method of contraception.

Some studies suggest that the introduction of supplements and consequent reduction in suckling stimulus may be the factor that precedes and determines the return of menstruation (44,56). Prema and colleagues (98) further suggested that early introduction of supplements was associated with shorter duration of lactational amenorrhoea and inter-pregnancy interval. In this study the average postpartum amenorrhoea was 11.5 months, while the mean age at introduction of supplements was 2.3 months for drinks and 2.5 months for foods. 64.8% of infants were however on supplements at less than 3 months and 64.2% were started on supplements at 3.5-6 months.

From the 2001 Population Reference Bureau on the Internet, only 12% of Kenyan children were exclusively breastfed at ages less than 6 months and 94% of the children were breastfed with complementary foods at 5-9 months (96). In this study 25.3% of children were exclusively breastfed at ages less than 6 months but breastfeeding rates

with complementary foods were difficult to compute. From the Population Reference Bureau on the Internet, the mean duration of any breastfeeding in Kenya was 21 months and the mean age of introduction of complementary foods was 6 months (96). From this study the mean duration of breastfeeding was 18.9 months and the mean age of introduction of complementary foods was 2.5 months. These results are lower than those reported earlier.

The Bellagio guidelines (32) suggest that contraceptive protection of breastfeeding is conferred only before the introduction of supplements to the babies diet. Supplementation is thought to reduce the baby's need to suckle, which reduces the neuro-endocrine stimulus at the breast and hastens return to fertility.

However, the introduction of supplementation does not automatically mean return to fertility since supplements do not at least initially always replace or substitute for breastfeeding (1,43,56,66,99).

It is now thought that it is lactational amenorrhoea rather than the supplementation that strongly influences postpartum fertility (36,43).

Short et al (36) showed that irrespective of when supplements were introduced in the baby's diet, breastfeeding could still give good protection against pregnancy up to 12 months postpartum, provided the mother is still amenorrhoeic.

In this study, at 3 months postpartum only 2.1% of mothers had returned to menstruation, this proportion was 32.3% at 6 months (a sharp increase from the 3-month proportion). The proportion then slowly rises to 48.5% at 9 months, and 59.5% at 12 months. These proportions are less than those found in a Tanzanian study except for the finding at 6 months (93). Resumption of menses at less than 10 weeks postpartum was influenced by the frequency of breast-feeding, the proportion resuming menses at this time decreased with increasing frequency of breast feeding in this population.

From the 2001 Population Reference Bureau (96) the median duration of postpartum amenorrhoea in Kenya was found to be 9 months. The median duration of postpartum amenorrhea was not computed in this study, but the mean duration of postpartum amenorrhea was 11.9 months.

Several factors have been shown to influence the return of menstruation, these include rural or urban residence, education and employment, maternal age and parity, maternal plane of nutrition. Most of these factors have also been shown to exert influence on breastfeeding pattern (1,16). In WHO study (1) most of the mothers who were residing in urban areas, employed or highly educated tended to breastfeed for shorter duration and similarly had early return to menses. In this study maternal age (being less than 19 years) affected breastfeeding negatively, parity (being para 2+0) influenced breastfeeding positively, educational status (those with primary and secondary education) influenced breastfeeding positively.



The percentages of those resuming menses at less than 4 weeks and at 5-10 weeks decreased with increasing frequency of breastfeeding during the night and the day. But this pattern was not realized in those resuming menses after 10 weeks.

Menses have been used to indicate the postpartum return of fertility during breastfeeding (57). This would mean that 40.5% of mothers in this community are already at risk of pregnancy before the end of 12 months postpartum, especially given the low contraceptive prevalence of 58.7% and the short postpartum sexual abstinence (66.1% of the study population resumed sexual intercourse before 20 weeks/5 months) with a mean duration of postpartum abstinence being 6.9 weeks (1.7 months). A Tanzanian study indicated that 70% of the mothers were at risk of pregnancy before the end of 12 months postpartum and low contraceptive prevalence (9.7%) and shorter postpartum sexual abstinence (mean = 3.5 months) (93).

Evidence from other studies indicates that breastfeeding alone still offers contraceptive protection even after menses have returned but to a lesser extent (57).

Kennedy and Visness (43), recently estimated the risk of pregnancy during lactational amenorrhoea to be similar to that of modern contraceptives. But this contraceptive effect decreases progressively with time postpartum (cumulative pregnancy rate was found to be 2% and 6% at 6 and 12 months respectively).

It would be expected that the proportion of amenorrhoeic women who would conceive would increase as duration of amenorrhoea increases. The proportion of amenorrhoeic women who conceived was not estimated in this population.

The extent of postpartum sexual abstinence varies considerably from one ethnic group to another. In a Tanzanian study, mean duration of postpartum sexual abstinence was 3.5 months (93). In this study, only 14.9% of women were still abstaining at 3 months postpartum compared to 48% at the same time in the Tanzanian study (93). The mean duration of postpartum abstinence was 6.9 +/- 0.34 weeks (approximately 1.7 months) in this study. This was much lower than in the Tanzanian study (93).

And at 6 months postpartum in this study, only 1.9% of mothers were still abstaining compared to 20% in a Tanzanian study at the same time postpartum (93).

Therefore postpartum sexual abstinence has a minor role in the fertility control in this study group and other effective contraceptives must be applied when the LAM criteria is not satisfied.

58.7% of the mothers interviewed were using some form of contraception at the time of the study. The most commonly used methods were Norplant (14.9%), Depo-Provera (13.2%) and Microlut (9.9%). These were all good choices for breastfeeding mothers as they do not interfere with lactation. The utilization of IUCD was notably low (7.2%) and yet it is a safe, cheap and effective method of contraception even in breast feeding mothers.

The contraceptive method used by those mothers at less than 6 months could not have contributed significantly to amenorrhea in these mothers as only 8.0% of them were using Norplant and Depo-Provera which could interfere with menses while a majority (79.5%) were using no method. Report from the Population Reference Bureau (2001 on the internet) stated that 39% of married women were using a method of family planning while 31% were using modern methods of contraception in Kenya (96). The contraceptive prevalence rate in this study population was therefore higher than levels given earlier.

From Demographic Health and World Fertility Survey, there was an increase in contraceptive use in Kenya from 17% in 1984 to 39% in 1998. Use of injectable contraceptives rose from 0.5 to 11.8% in the same period, a rise in oral contraceptive use from 3.1 to 8.5%, while IUCD use fell slightly from 3 to 2.7% over the same period. Female sterilization rose from 2.6 to 8.5% over the same period (100).

From this study, injectable contraceptives were being used by 13.2%, IUCD by 7.2% and female sterilization by only 2.2%, which indicated a drop in both IUCD and female sterilization.

Postpartum women have little need for contraception for up to 6 months after delivery if they have not resumed menstruation and they are fully or nearly fully breast feeding (breast feeding accounting for at least 85% of baby's feeds). Recent studies have reported a high degree of pregnancy protection for at least 6 months postpartum and somewhat less protection up to 12 months if menstruation has not resumed (101,102,103).

As a general rule, breast feeding women begin to use progestin only pill as soon as 6 weeks after child birth according to World Health Organization medical eligibility criteria for contraceptive methods. If a woman is partially breast-feeding and her child receives much of other food and drink, six weeks after child birth is the best time to start progestin only pills, if she waits longer fertility may return (101, 104).

The percentage of those satisfying the lactational amenorhea method (LAM) criteria at less than 6 months in this study was 36.7%. This indicates under-utilization of this method of contraception and given that this population also resumes sexual activity early (mean duration of 6.9 weeks), then alternative modern family planning methods should be used in this population.

## **CONCLUSIONS**

- 1) There was early introduction of infant feeds in this study group, with almost 60% having introduced solid feeds by 6 months.
- 2) The duration of post partum sexual abstinence was quite short, by 6 months only 1.9% were still abstinent. Post partum sexual abstinence will therefore have a minor role in birth control in this community.
- 3) Breast-feeding rates were fairly low in this group and the period of breast-feeding also short. Only 9.1% were still breast-feeding at 24 months.

- 4) Only a few of the clients in the study (36.7%) satisfied the LAM criteria. This was mainly due to early introduction of feeds or early resumption of menstruation.
- 5) By the 6<sup>th</sup> post-delivery month, 40.4% of clients had resumed menstruation. Yet there was low utilization of other family planning methods with 79.5% of clients on no method at all.
- 6) Early resumption of menstruation was associated with low breast-feeding frequency during the waking hours and at night.
- 7) Almost 60% of the clients interviewed were using some form of family planning at the time, but low utilization IUCD and tubal-ligation was noted.

### **RECOMMENDATIONS**

- 1) The information (education) that health personnel are continuing to gain should be utilized to educate the breast feeding mothers on exploitation of full benefits from breast-feeding.
- 2) The lactational amenorrhea method of contraception should be encouraged and emphasized in this set up, as this would spare the scarce government resources.
- 3) Health personnel should encourage their clients to delay supplementation of breastfeeding as it is unnecessary before 6 months.
- 4) The selection of contraceptive methods should emphasize on safe, effective and less expensive methods in order to spare the scarce resources.
- 5) The future priority should be to disseminate accurate and effective information about LAM that can be easily interpreted by health workers and understood by breast feeding mothers.
- 6) Education and counseling about good breast feeding practices remains important and needs to cover all aspects of breast-feeding behavior, this will lengthen the duration of lactational amenorrhea.

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## **APPENDIX I**

### **QUESTIONNAIRE TITLE**

**A STUDY ON THE KNOWLEDGE, ATTITUDE, PRACTICE AND BEHAVIOUR TOWARDS HIV/AIDS, HIV SCREENING AND AZT THERAPY AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT KENYATTA NATIONAL HOSPITAL.**

## QUESTIONNAIRE

### Demographic data

1. Name \_\_\_\_\_ Clinic No. \_\_\_\_\_

2. Age \_\_\_\_\_ I) 13-20   
ii) 21-28   
iii) 29-36   
iv) >36 years

3. Residence \_\_\_\_\_

4. Level of education

- i.) Nil  (ii) Primary  (iii) Secondary  (iv) Post Secondary

5. Marital Status

- i.) Married  ii.) Single  iii.) Separated/Divorced  (iv) Widowed

b) If married – Monogamous marriage

- Polygamous marriage

6. Parity I) 0-2   
ii) 3-5   
iii) 6-9   
iv)  $\geq 10$

2. Occupation – Yours \_\_\_\_\_

- Husbands \_\_\_\_\_

### Sexual history

1. At what age did you first have sexual intercourse? \_\_\_\_\_

2. How many sexual partners have you had since then? \_\_\_\_\_

3. (a) Have you changed sexual partners during the last 2 years?

i.) Yes  ii) No

(b) Have you changed sexual partners during this pregnancy?

i.) Yes  ii) No

4. (a) How many times do you have sex in a week?

i.) 1-3  ii) 3-5  iii) >5

b) Have you and your spouse ever used condoms during this pregnancy

i.) Yes  ii) No

If yes why? \_\_\_\_\_

c) Would condoms be of use in pregnancy?

i.) Yes  ii) No  iii) I Don't know

### Knowledge

1. Name the STDS (Sexually Transmitted Diseases) you know

i) Gonorrhoea

ii) Syphilis

iii) AIDS

iv) Candidiasis

v) Trichomoniasis

vi) Herpes

vii) Others  Please specify \_\_\_\_\_

2. What do patients with STDs complain of?

i) Genital ulcer

ii) Vaginal/Urethral Discharge

- iii) Pain on passing urine
- iv) Weight loss
- v) Lower abdominal pains
- vi) Infertility
- vii) Others  Please specify \_\_\_\_\_
- viii) I do not know

3. How can one avoid getting STDs?

- i) Avoiding multiple sexual partners
- ii) Using condoms
- iii) Abstinence from sex
- iv) Others  Please specify \_\_\_\_\_

4. a) Have you suffered from an STD during this pregnancy?

- i.) Yes
- ii) No

b) If yes specify the symptoms you had \_\_\_\_\_  
\_\_\_\_\_

5. What causes HIV infection and AIDS?

- i) Bacterial infection
- ii) Fungal infection
- iii) Viral infection
- iv) Others  Specify \_\_\_\_\_

6. How is HIV infection transmitted?

- i) Sexual contact
- ii) Blood transfusion
-

iii) Trans-placentally from the mother

iv) Breast-feeding

v) Mosquito bites

vi) Casual contact

vii) Others

7. Can patients with HIV infection be identified by looking?

i) Yes

ii) No

8. What are the characteristics of a patient with HIV infection?

i) Emaciated

ii) Could be healthy

iii) Others  Specify \_\_\_\_\_

9. Can an HIV infected mother get a baby without HIV infection?

i.) Yes  ii) No

10. a) Can a child be born with HIV infection?

i.) Yes  ii) No

b) If yes, from where? \_\_\_\_\_

11. Does HIV/AIDS have cure?

i) Yes

ii) No

12. What tests do you know for HIV infection?

i.) ELISA  ii) PCR/Viral culture  iii) Western blot

iv) Others  Specify \_\_\_\_\_

13. What does ELISA test for HIV indicate?
- i) Presence of antibodies against HIV
  - ii) Virus for HIV
  - iii) I don't know

14. If HIV test is negative what might this indicate?
- i) True negative
  - ii) Incubation state of the disease
  - iii) I don't know

**Attitude and behaviour**

1. If the government decided that all Kenyans be tested for HIV, how would you react?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. If someone you know tested positive for HIV, how would you behave towards them ?
- i) Avoid them
  - ii) Show love and care for them
  - iii) Other  Specify \_\_\_\_\_

3. a) Would you like to know if you have HIV infection by having a blood test?
- i) Yes
  - ii) No
- b) If no, why? \_\_\_\_\_

4. a) If you had your HIV test done, would you like your husband to know the results?
- i) Yes

ii) No

b) If no, why? \_\_\_\_\_

5. Why do you think your husband should know your results?

---

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6. If your HIV test results came back as positive, what would be your reaction?

---

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7. What if you tested negative, what would be your reaction?

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8. a) Are you aware of any medication currently being used to reduce transmission from mother to baby?

i) Yes

ii) No

b) If yes, which one? \_\_\_\_\_

i.) Yes

ii) No

iii) I do not know

9. a) If you tested positive for HIV would you like any medication to be used on you in order to reduce the chance of infection transmission to your baby?

i) Yes

ii) No

b) If no, why? \_\_\_\_\_

10. What beliefs exist in your society about HIV/AIDS?

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11. What can society do to effect behaviour change in its members to curb the HIV/AIDS epidemic?

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**INFORMED CONSENT FORM FOR HIV TESTING IN PREGNANCY**

I UNDERSTAND THAT,

- 1) THE HUMAN IMMUNE-DEFICEINCY VIRUS (HIV) IS THE VIRUS THAT CAUSES AIDS
- 2) I AM BEING TESTED BECAUSE HIV IS SPREAD BY SEXUAL INTERCOURSE, SO ALL PREGNANT WOMEN ARE POTENTIALLY AT RISK OF HIV INFECTION.
- 3) HIV IS A SERIOUS ILLNESS THAT AFFECTS MY HEALTH AND CAN AFFECT MY BABY'S HEALTH.
- 4) MY DOCTOR MUST KNOW IF I HAVE HIV, TO PROPERLY TREAT ME AND MY BABY.
- 5) EARLY DIAGNOSIS AND TREATMENT FOR HIV INFECTION WILL REDUCE THE CHANCE THAT MY BABY WILL BECOME INFECTED AND DEVELOP AIDS
- 6) A SINGLE NEGATIVE HIV TEST CANNOT RULE OUT HIV INFECTION IN ALL CASES. IF YOU AND YOUR DOCTOR AGREE THAT IT IS NECESSARY, YOU CAN RECEIVE AN ADDITIONAL HIV TEST LATER IN YOUR PREGNANCY OR AT THE TIME OF DELIVERY.
- 7) A BLOOD TEST FOR HIV HAS THE SAME RISKS AS ALL OTHER BLOOD TESTS. THESE ARE BRUISING, TNDERNESS, MINO PAIN AND INVERY RARE OCCASIONS, INFECTION AT THE SITE WHERE BLOOD WAS DRAWN.
- 8) I AGREE THAT MY HEALTH CARE PROVIDER HAS DISCUSSED HIV AND HIV TESTING WITH ME AND ANSWERED MY QUESTIONS.

I CONSENT TO HIV TESTING

\_\_\_\_\_  
\_\_\_\_\_  
SIGNATURE

I AM REFUSING TO BE TESTED FOR HIV EVEN IF I HAVE BEEN TOLD THE IMPORTANCE OF THE TEST FOR MY HEALTH AND MY BABY'S HEALTH AND THAT THERE IS A HIGHER CHANCE THAT MY BABY WILL DEVELOP AIDS IF I AM INFECTED WITH HIV AND REFUSE TESTING

-----  
SIGNATURE

I AM REFUSING HIV TESTING BECAUSE -----  
-----  
-----

## APPENDIX II

### SCREENING QUESTIONNAIRE

#### TITTLE

A SURVEY ON BREAST-FEEDING PATTERNS, RESUMPTION OF MENSTRUATION AND CONTRACEPTIVE USE AMONG BREAST-FEEDING FAMILY PLANNING AND MCH CLIENTS AT KNH.

- 1.) CLINIC NUMBER-----
- 2.) STUDY NUMBER-----
- 3.) DATE OF LAST DELIVERY----- IF MORE THAN 3YEARS,EXCLUDE.
- 4.) HOW MANY INFANTS DID YOU GIVE BIRTH TO DURING LAST DELIVERY----- IF MORE THAN ONE, EXCLUDE.
- 5.) PARITY----- IF LESS THAN TWO,EXCLUDE.
- 6.) BREAST-FEEDING OF THE PRIOR CHILD----- IF NO, EXCLUDE.
- 7.) CHILD WITH CLEFT LIP OR PALATE----- IF YES , EXCLUDE.

**MAIN QUESTIONNAIRE**

**DEMOGRAPHIC DATA**

1. a) Study number----- Clinic No. \_\_\_\_\_  
b) Level of education \_\_\_\_\_  
c) Occupation \_\_\_\_\_  
d) Age \_\_\_\_\_
2. Marital status \_\_\_\_\_
3. Parity \_\_\_\_\_
4. Residence \_\_\_\_\_
5. Date of last delivery \_\_\_\_\_

**Breastfeeding pattern;**

1. How old is the child you are currently breastfeeding (index child)?-----  
--months
2. How often do you breastfeed your index child during the day?  
----- Times
3. How often do you breastfeed your index child during the night?  
----- Times
4. How long do you take for one breastfeeding episode?  
----- Minutes
5. A) Have you started giving your child some other food or drink besides Breast milk?  
i) yes  
ii) No  
iii) b) If yes, at what age did you start the drink and the food?  
Drink ----- months      Food ----- months
6. How long did you breastfeed your prior child?  
----- Months.
7. What was the reason for stopping breast-feeding in your prior child?  
-----  
-----  
-----

**Sexuality/fertility**

8. What are the age difference in years between your two last children?  
----- Years
9. How long did you take before resuming sexual contact after your last delivery?  
----- Weeks
10. After resuming sexual contact, how often did you continue having it?  
----- Times per week.
11. A) Have you resumed menstruation since last delivery?  
I) Yes \_\_\_\_\_ ii) no \_\_\_\_\_  
b) If yes, how long after the last delivery? ----- Weeks
- c) After what period of time did you resume menstruation after delivery of your Prior child? ----- Weeks
12. A) Are you using any family planning method since the last delivery?  
I) Yes \_\_\_\_\_ ii) No \_\_\_\_\_
- b) If yes, which one are you using? -----
- c) If using a method, how soon after delivery was the method started? -----  
-- Weeks
- d) If using hormonal method, which one? -----
- D.) L.A.M definition;
13. Is your baby less than 6 months? Yes---- No-----  
Are you fully or nearly fully breast-feeding? Yes---- No-----  
Have you started having menstruation again? Yes---- No-----  
Have you started other feeds for the baby? Yes---- No-----

**APPENDIX III**

**LETTERS OF ETHICAL APPROVAL FOR GYNAECOLOGY AND  
OBSTETRIC LONG COMMENTARIES**

Tel: 726300 - 19  
726450 - 9  
726550 - 9



**KENYATTA NATIONAL HOSPITAL**  
**P.O. Box 20723, Nairobi**

Telegrams: "MEDSUP", Nairobi

Email: [knh@healthnet.or.ke](mailto:knh@healthnet.or.ke)

Fax: 725272

Ref.....KNH-ERC/Q1/925

Date...15 February 2001

Dr. Damaris Wambui Kamau  
Dept. of Obs/Gynae  
Faculty of Medicine  
University of Nairobi

Dear Dr. Kamau,

RE: REVISED RESEARCH PROPOSAL "A SURVEY ON BREASTFEEDING PATTERNS AND RESUMPTION OF MENSTRUATION AND CONTRACEPTIVE USE AMONG BREASTFEEDING FAMILY PLANNING AND MCH CLIENTS AT KENYATTA N. HOSPITAL". (P859/2/2000)

This is to inform you that the KNH-Ethical and Research Committee has reviewed and approved the revised version of your above cited research proposal.

However, the presentation of the bibliography is still an issue of concern that you must address as you prepare your dissertation. Refer to comment No. 7 in our previous communication to you.

On behalf of the Committee, I wish you a fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely,

PROF. A.N. GUANTAI  
SECRETARY, KNH-ERC

cc Prof. K.M. Bhatt  
Chairman, KNH-ERC

DD (C/S), KNH

Supervisors: Prof. S.B.O. Ojwang, Dept. of Obs/Gyane, UON  
Dr. William Obwaka, Dept. of Obs/Gynae, UON

The Chairman, Dept. of Obs/Gynae, UON

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KENYATTA NATIONAL HOSPITAL  
P.O. Box 20723, Nairobi

Ref. KNH/ERC/01/685.....

Date 24th August, 1999

Dr. Damaris W. Kamau,  
Department of Obs/Gynae,  
Faculty of Medicine,  
University of Nairobi.

Dear Dr. Kamau,

RE: REVISED RESEARCH PROPOSAL "A STUDY ON THE KNOWLEDGE, ATTITUDE,  
PRACTICE AND BEHAVIOUR TOWARDS HIV/AIDS, HIV SCREENING AND AZT  
THERAPY AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT  
KENYATTA NATIONAL HOSPITAL" (P780/5/99)

This is to inform you that the Kenyatta National Hospital Ethical  
and Research Committee has reviewed and approved the revised version  
of your above cited research proposal.

On behalf of the Committee I wish you fruitful research and look  
forward to receiving a summary of the research findings upon completion  
of the study.

This information will form part of data base that will be consulted  
in future when processing related research study so as to minimize  
chances of study duplication.

Thank you.

Yours faithfully,

PROF. A.N. GUANTAI  
SECRETARY, KNH-ERC

c.c. Prof. K.M. Bhatt,  
Chairman, KNH-ERC,  
Dept. of Medicine, UON.

Deputy Director (CS),  
Kenyatta N. Hospital.

Supervisors: Prof. S.B.O. Ojwang, Dept. of Obs/Gynae, UON.

Dr. William Obwaka, Dept. of Obs/Gynae, UON.

Dr. Omondi Ogutu, Dept. of Obs/Gynae, UON.  
Chairman, Dept. of Obs/Gynae, UON.

Dean, Faculty of Medicine, UON.