

# Lactational Amenorrhoea and Modern Contraceptives Use among Nursing Women in Egypt 2003

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## Abstract

**Objectives:** To evaluate the potential for Lactational Amenorrhoea Method (LAM) and passive LAM among women with children below 6 months in the 2003 Egypt Demographic Health Survey (2003 EDHS), to assess the determinants of amenorrhea, and to examine the association of exclusive breastfeeding and amenorrhea with using modern contraceptive methods among nursing mothers of children below 2 years, adjusting for other associated variables.

**Methods:** Data from the 2003 EDHS was downloaded from the DHS website. A sub-sample of women fulfilling all the four criteria were selected: 1) women with last birth of children less than 2 years; 2) currently married; 3) not being sterilized; and 4) currently breast feeding their children. Accordingly, 1934 women entered into the statistical analysis, of them 629 had children below 6 months.

**Results:** Nearly 24% of nursing mothers with children below 6 months met LAM criteria, of them passive LAM users constituted 79.1%. For women with children below 24 months, determinants of amenorrhea were exclusive breast feeding, unemployment, number of living children, husband education, number of feeding

at night, and having a male sex child. Higher education, urban residence, positive attitude towards contraception increased the likelihood of modern contraceptives use, whereas amenorrhea, exclusive breast feeding, and having a wanted child decreased its likelihood in multivariate analysis.

**Conclusion:** Exclusive breast feeding was associated with amenorrhea and modern contraceptive methods use in a direct and inverse fashion respectively. LAM is a commonly used method but it is liable to discontinuation or violation of its criteria. Hence, it is recommended to educate both the health care providers and users about it.

**Keywords:** LAM; breast feeding; amenorrhea; modern contraceptives methods; 2003 EDHS.

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## Introduction

The choice of a postpartum contraceptive method depends on many factors, including the need for a temporary versus a permanent method, the extent to which informed consent is made prior to delivery, and the infant feeding choice.<sup>1</sup> Lactational amenorrhoea method (LAM) is a family-planning option of potential importance in developing countries including Egypt.<sup>2,3</sup> However, LAM was not tested until 1988, when an international group of researchers met in Bellagio and reached a consensus about LAM criteria.<sup>2</sup> LAM has three elements: (a) full or nearly full breastfeeding, (b) postpartum amenorrhoea and (c) an infant aged under 6 months.<sup>4,5</sup>

Khella et al. reported a widespread use of what they called "passive LAM".<sup>3</sup> They defined "passive LAM" as women who (a) satisfied the three elements of LAM, (b) did not report use of another method and (c) did not report relying on prolonged breastfeeding as a method of family planning.<sup>3</sup> To simplify, passive LAM users are mothers having LAM secondary to breast feeding but not using it for that purpose and/or do not know its benefit as a family planning method

LAM is limited to 6 months because infant-feeding guidelines recommend that supplementation with other foods should begin at 6 months.<sup>3</sup> However, some research suggested that increasing

the 6 months criterion to 9-12 months after delivery might be possible under certain conditions (e.g. if breast feeding takes place immediately before each supplementary feeding). The end of amenorrhoea indicates a return of ovarian activity,<sup>6</sup> hence, the most critical LAM criteria is being amenorrhoeic.

LAM is unquestionably cost – effective, as breastfeeding alone provides adequate nutrition and fluid intake through the first 6 months, and breast milk is considered a healthier option than its substitutes for infants in low-resource settings as Egypt.<sup>7</sup> A previous study in Egypt aimed to analyse the acceptance of LAM proved that the overall post acceptance satisfaction with LAM was nearly 84%.<sup>8</sup> Moreover, LAM provides at least equal protection against pregnancy during the first 12 months postpartum than typical modern contraceptive methods.<sup>9</sup> Ramos et al. found that the effectiveness of LAM during amenorrhea was 97% at 12 months postpartum.<sup>10</sup> Van Unnik and Roosemalen stated that LAM plays a crucial role in Africa where the average number of children per women is 6, whereas without breastfeeding the estimated figure would be 10.<sup>11</sup>

The aim of this study was to evaluate the potential for LAM and passive LAM among women with children below 6 months in the

2003 Egypt Demographic Health Survey (2003 EDHS), to assess the determinants of amenorrhea, and to examine the association of exclusive breastfeeding and amenorrhea with using modern contraceptive methods among nursing mothers of children below 2 years, adjusting for other associated variables.

## Methods

Data from the Egypt Demographic Health Survey in the year 2003 (2003 EDHS),<sup>12</sup> was downloaded on 17<sup>th</sup> May 2006 for free from the Demographic and Health Surveys website.<sup>13</sup> Before downloading data, the author submitted a mini proposal as a request for access to datasets and it was approved before access was granted. Access is only granted for legitimate research purposes. Secondary in-depth analysis of survey data was conducted. The 2003 EDHS ever married women sample comprised 9,259 women. The sample design, detailed study methods and tools of the original study was previously published by El Zanaty and Way.<sup>12</sup>

From the 2003 EDHS data,<sup>13</sup> a sub-sample of women was selected for the current study. Women fulfilling all the four criteria were selected: 1) women with last birth of children less than 2 years; 2) currently married; 3) not being sterilized; and 4) currently breast feeding their children. Accordingly, 1934 women entered into the statistical analysis, of them 629 had children below 6 months.

The outcome or dependent variables introduced in the logistic regression analysis in the current study were: amenorrhea among nursing mothers with children below 36 months, exclusive breast feeding to children aged below 6 months, current use of modern methods by nursing mothers with children below 6 months and below 36 months, and use of passive LAM among mothers with children below 6 months.

The independent or predictor variables entered in the different logistic regression models (with slight differences according to the outcome variable in the model) were: women's age, women education, work status, residence, number of living children, age and sex of the child, child birth order, twin child or not, wanted child at pregnancy or not, exclusive breast feeding of the child or not, number of breast feeding times per day and at night, wife's attitude towards use of contraceptives and husband's education. Data analysis was conducted using SPSS for Windows, version 12.<sup>14</sup> Data are given as counts, percentages and means. After doing the univariate analysis for the study variables, different logistic regression models were run to get the most significant associated predictors adjusted for each other to the outcome variables aforementioned. The outcome dichotomous variable was coded to 0 and 1. Odds ratio in logistic regression shows the change (increase or decrease) in the likelihood of the studied outcome variable when the predictor variable(s)

changed adjusting for other variables in the model. *P*-value equal to or below 0.05 was considered significant in all statistical tests.

## Results

The age of the sample ranged between 15-48 years with a mean Standard deviation equal to 26.8 years (5.9). Only 39.3% of the sample women had secondary education or higher and 10.3% were working for cash. Nearly 49.3% of their husbands had secondary education or higher. Nearly 69.4% of the women were rural residents. About 2.4% of the women reported that they disapprove using contraceptives or at least had unknown attitude. Their mean (SD) number of living children was 2.6 child (0.7) with a birth order mean (SD) of 2.9 (1.9). Only 1.4% of women had twins in their last birth and 80.1% of them wanted this child when pregnant. About 39.1% of the sample had amenorrhea. (Data not shown in table)

Table 1 shows that nearly 28% of nursing mothers with children below 6 months were exclusive breast feeders, irrespective of their amenorrhea status. Of them, nearly 86.4% had amenorrhea. Six months and later, only 3 cases still reported exclusive breast feeding of their children, of them one case (33.35) had amenorrhea. Those who reported not exclusive breast feeding showed a decline trend in their amenorrhea status.

The mean (SD) number of day breast feeding and night breast feeding were 6.8(3.6) and 4.5(2.9) times respectively. The determinants of exclusive breast feeding to children aged below 6 months were investigated by logistic regression model. Increase in child age, and working for cash decreased the likelihood of exclusive breast feeding. Mothers' age, level of education of the mother or husband, number of living children, number of breastfeeding times per day and by night and whether the child was wanted or not did not predict exclusive breast feeding. (Data not shown in table)

Table 2 shows that 52.1% of the nursing mothers with children below 6 months reported using no contraceptive method. However, 82% of the non users had amenorrhea. Of 629 women, 152 women (24.2%) met the LAM criteria. Passive LAM users defined as LAM women who reported using no contraceptive methods nor prolonged breast feeding constituted 79.6% of the women who met LAM criteria. Passive LAM users also constituted 19.2% of all nursing mothers of children below 6 months. About 11.8% of women LAM users were under double coverage of family planning methods.

Nearly 37% of the sub-sample with children below 6 months reported using any of the modern methods and the Intrauterine devices (IUDs) were the most common method. For the whole sample with children below 24 months, 50.1% of them were using modern methods with the majority using IUDs.

**Table 1.** Amenorrhoea among nursing mothers with children below 24 months according to their child age and type of breast feeding (n=1934)

Breast feeding	Age in months								Total (with or without amenorrhoea) n
	<6		6-8		9-11		12-23		
	No. with Amenorrhoea	% with Amenorrhoea	No. with Amenorrhoea	% with Amenorrhoea	No. with Amenorrhoea	% with Amenorrhoea	No. with Amenorrhoea	% with Amenorrhoea	
Non-Exclusive	263	58.1	118	40.3	90	30.3	133	18.7	1754
Exclusive	152	86.4	1	33.3	0	0.0	0	0.0	180

**Table 2.** Current use of family planning methods by amenorrhoea status of currently married nursing mothers with children below 6 months of age

Family planning methods	Children < 6 months of age							
	No amenorrhoea		Amenorrhoea		Amenorrhoea with exclusive breast feeding		Total	
	No.	%	No.	%	No.	%	No.	%
Not using	59	27.6	148	56.3	121	79.2	328	52.1
Pills	40	40	15	5.7	2	2	57	9.1
IUDs <sup>1</sup>	64	64	44	16.7	11	11	119	18.9
Injections	37	17.3	13	4.9	4	4	54	8.6
Other modern or traditional methods	12	5.6	2	0.8	1	0.7	15	2.4
PBF <sup>2</sup>	2	0.9	41	15.6	13	8.6	56	8.9
Total	214	100	263	100	152	100	629	100
Number (%) of women with children below 6 months not using any method with amenorrhoea (n=629)							269	82.0%
Number (%) of women with children below 6 months using the common modern methods (n=629)							230	36.6%
Number (%) of women with children below 24 months using the common modern methods (n=1934)							968	51.1%

IUDs: Intra Uterine Devices; PBF:Prolonged Breast Feeding

Variables associated with passive LAM among mothers with children below 6 months were investigated in a logistic regression model where all variables were adjusted to each other. Husband level of education, significantly and independently, inversely predicted passive LAM along with increase in child age (OR = 0.84 and 0.29 respectively). (Data not shown in table)

Not working for cash, increased number of living children, and exclusive breast feeding increased the likelihood of amenorrhoea among nursing mothers with children below 24 months in logistic regression model. Whereas mothers' age did not predict amenorrhoea, increase in child's age and being of female sex decreased this likelihood. Lower husbands' level of education, number of breast feeding by night increased the likelihood of amenorrhoea. (Table 3)

For mothers with children below 24 months, women's higher level of education and empowerment, child age, and positive attitude towards contraception predicted use of modern methods. Moreover, women with amenorrhoea, exclusive breast feeders, rural

residents, and those having a wanted child, were less likely to use modern methods. (Table 4)

## Discussion

The current study investigated the associated variables with exclusive breast feeding by mothers with children below 6 months, the predictors of amenorrhoea among nursing mothers with children below 2 years, the determinants of using passive LAM, and the predictors of using modern methods of contraception. However, the study still has its limitations. First, the nature of the study design where causality and/or temporal association could not be established in cross-sectional design. Second, questionnaires have its limitation. It is possible that a response to a single question presented in a survey context does not reflect the actual views of these women because there is often discordance between such responses and individual actions. Another limitation is the dearth of research on LAM and passive LAM in the Arab world published in PubMed indexed journals and the diversity in its methodology and statistical analysis.

**Table 3.** Determinants of amenorrhoea among currently married nursing mothers with children below 24 months (n=1934)

Determinant	Odds Ratio <sup>2</sup>	CI 95% <sup>3</sup>	
Work status (RC <sup>1</sup> = work for cash)	1.75	1.2	2.53
Child sex (RC= male)	0.79	0.64	0.98
Husband Education (RC = illiterate)	0.89	0.84	0.95
Number of breast feeding by night (RC= <5 times)	1.26	1.02	1.56
Child age (in months)	0.86	0.84	0.87
Number of living children	1.54	1.32	1.79
Exclusive breast feeding (RC = no )	1.01	1.007	1.02

RC: Reference Category; CI: Confidence Interval

**Table 4.** Determinants of current use of modern family planning methods among currently married nursing mothers with children below 24 months (n=1934)

Determinant	Odds Ratio <sup>4</sup>	CI 95% <sup>5</sup>	
Amenorrhoea (RC <sup>1</sup> = No)	0.17	0.14	0.21
Education (RC = illiterate)	1.34	1.23	1.45
Residence (RC = Urban)	0.57	0.45	0.73
Women's attitude towards contraception (RC= no approval)	7.26	2.94	17.92
Wanted child (RC = not wanted at pregnancy)	0.56	0.43	0.73
Exclusive BF <sup>3</sup> (RC = no )	0.991	0.987	0.995

RC: Reference Category; HH: Household; BF: Breast Feeding; CI: Confidence Interval 95%

The logistic regression model in the current study revealed that the number of breast feeding by night did independently predict amenorrhoea. Our findings are consistent with another study that showed that the degree of ovarian suppression is enhanced by increased frequency of suckling, longer duration of feeds, and more frequent night-time feeds.<sup>15</sup> The frequent suckling or more intense suckling maintains the contraceptive effect, as nipple stimulation during suckling is sufficient to suppress ovulation.<sup>16</sup> However, Khella et al. proved that the number of daytime breastfeeds and not the night time breastfeeds predicted amenorrhoea among breast feeding mothers in the 1995 EDHS data.<sup>3</sup> In our study, the exclusive breast feeding variable was also a predictor for amenorrhoea. Our study proved that the number of living children as a proxy to parity was associated with amenorrhoea whereas mothers' age was not. That is partially consistent with previous studies that proved that parity and greater maternal age are associated with prolonged amenorrhoea.<sup>17-19</sup> Amenorrhoea among nursing mothers was also significantly predicted by the age of the child in inverse fashion in both our study and Khella et al. study.<sup>3</sup> The female sex of the child inversely predicted amenorrhoea in the current study. However, this could not be explained by the preference of male gender child to be exclusively breastfed, because of the lack of association of child sex with exclusive breast feeding in the current study.

Albeit the proved efficacy of LAM in the first 6 months of lactation in previous studies, the current study showed that nearly 12% of women who met the LAM criteria were under double coverage of family planning methods. Previous analysis of DHS data estimated significant percentages of "double coverage" by both modern contraceptives and lactational amenorrhoea in more than one country.<sup>20</sup> This could be attributed to the fact that a part of women who met the LAM criteria were not aware of its efficacy. A previous survey in Turkey revealed that about half of the women were not aware of the contraceptive effect of breastfeeding, with the lowest knowledge among illiterate women.<sup>21</sup> Because estrogens inhibit lactation, the use of combined oral contraceptives is probably one of the reasons why breastfeeding fails in some countries as the Netherlands.<sup>22</sup> Combined oestrogen/progestin methods should be avoided by all nursing or non nursing women for 2-3 weeks to avoid elevating the risk of thrombo-embolism.<sup>1</sup>

Despite 37% and 52.1% of the total sample and mothers of children below 6 months reported using no contraceptive methods respectively; the majority of them (52.9% and 82% respectively) had amenorrhoea. These findings might support the notion that a part of breastfeeding mothers who reported not using contraceptive methods were in fact relying on lactational amenorrhoea for birth spacing, including many with children older than 6 months.<sup>3</sup> The most critical of LAM criteria is being amenorrhoeic since the end

of amenorrhoea indicates a return of ovarian activity.<sup>6</sup> The early introduction of high-calorie liquids or foods, other than breast milk, to infants has been shown to be associated with a shorter duration of amenorrhoea in Bangladesh<sup>23</sup> and Scotland.<sup>24</sup> Conversely, Ravera et al. found that return of menses is irrespective of whether supplements have been introduced and their frequency.<sup>25</sup> In studies that analyzed separately cow milk fed by bottle and other types of food, only bottle-feeding was associated with a shorter duration of amenorrhoea in the United States<sup>26</sup> and the Philippines.<sup>27</sup> The authors of the latter study concluded that "supplements in the form of semisolids or liquids other than milk have no appreciable effect on the risk of return to menses". Yet, further research is needed before amending the LAM criteria,<sup>6</sup> because a significant proportion of women ovulate before signs of bleeding.<sup>28</sup> On the other hand, even a menstruating nursing mother is 30% less likely to conceive compared to a non-nursing mother,<sup>28</sup> because the complete ovarian suppression could be followed by anovulatory menstrual cycles or ovulatory cycles that manifest luteal phase deficiency.<sup>15</sup>

Use of passive LAM among mothers with children below 6 months was inversely associated with husbands' education and child age. The first could be explained by the inclination of educated husbands to urge their wives to use modern contraceptive methods. The second could be explained by the introduction of complimentary food with increase in child age. Higher education, urban residence, and positive attitude towards contraception increased the likelihood of modern contraceptives use; whereas amenorrhoea, exclusive breast feeding, and having a wanted child decreased its likelihood in multivariate analysis. Exclusive breast feeding was associated with amenorrhoea and modern contraceptive methods use in a direct and inverse fashion respectively.

Looking at all the logistic regression models, we could conclude that not working women, with lower education, or lower husband's level of education, living in rural residence, and with higher parity were more likely to breast feed their children exclusively, and more likely to have amenorrhoea and hence less likely to use modern methods of contraception. Therefore, LAM and Prolonged breast feeding (PBF) are common used methods among them but still liable to discontinuation or violation of its criteria. Because of the potential acceptability of breast feeding as a contraceptive method to Egyptian women, we would like to highlight the need for an educational program for both the health care providers and the nursing women in Egypt about the criteria for LAM and the importance of amenorrhoea in PBF. Moreover, the necessity for switching to another contraceptive method at 6 months, or earlier if the LAM criteria has been violated or the woman no longer has amenorrhoea. Such program would cover the knowledge gaps and misunderstanding of LAM and PBF and would prohibit its

discontinuation. If the potential of LAM to be a conduit to other modern contraceptive methods is effectively realized, the method can be profoundly important in family formation.

## References

1. Kennedy KI. Post-partum contraception. *Baillieres Clin Obstet Gynaecol* 1996 Apr;10(1):25-41.
2. Canto-de Cetina T, Polanco-Reyes L. Lactational amenorrhoea as a method of family planning. *Salud Publica Mex* 1996 Jan-Feb;38(1):58-63. Abstract, Article in Spanish.
3. Khella AK, Fahim HI, Issa AH, Sokal DC, Gadalla MA. Lactational amenorrhoea as a method of family planning in Egypt. *Contraception* 2004 Apr;69(4):317-322.
4. World Health Organization Task Force on Methods for the Natural Regulation of Fertility. The World Health Organization multinational study of breast-feeding and lactational amenorrhoea. III. Pregnancy during breast-feeding. *Fertil Steril* 1999 Sep;72(3):431-440.
5. World Health Organization Task Force on Methods for the Natural Regulation of Fertility. The World Health Organization Multinational Study of Breast-feeding and Lactational Amenorrhoea. I. Description of infant feeding patterns and of the return of menses. *Fertil Steril* 1998 Sep;70(3):448-460.
6. Finger WR. Research confirms LAM's effectiveness. *Contraceptive update. Network* 1996;17(1):12-14, 24.
7. Kennedy KI, Kotelchuck M. Policy considerations for the introduction and promotion of the lactational amenorrhoea method: advantages and disadvantages of LAM. *J Hum Lact* 1998 Sep;14(3):191-203.
8. Makhlof AM, Salah M, Shaaban MM, Labbo KM. A clinical study of lactational amenorrhoea method for family planning in Egypt. *Contraception* 1997;1:63-72.
9. Kennedy KI, Visness CM. Contraceptive efficacy of lactational amenorrhoea. *Lancet* 1992 Jan;339(8787):227-230.
10. Ramos R, Kennedy KI, Visness CM. Effectiveness of lactational amenorrhoea in prevention of pregnancy in Manila, the Philippines: non-comparative prospective trial. *BMJ* 1996 Oct;313(7062):909-912.
11. van Unnik GA, van Roosmalen J. Lactation-induced amenorrhoea as birth control method. *Ned Tijdschr Geneesk* 1998 Jan;142(2):60-62. Abstract. Article in Dutch.
12. El Zanaty F, Way A. Egypt Demographic Health Survey 2003. Calverton, Maryland [USA]: Ministry of Health and Population [Egypt], National Population Council and ORC Macro 2004.
13. MEASURE DHS. Demographic and Health Surveys. Available at <http://www.measuredhs.com/login.cfm>. Accessed August 20, 2006.
14. SPSS Inc. SPSS for Windows, Version 12.0 [Software]. Chicago, IL: SPSS Inc.; 2003.
15. Edozien L. The contraceptive benefit of breastfeeding. *Afr Health*. 1994; 16:15, 17.
16. Townsend S. A new contraceptive method: breast feeding. *Imbonezamuryango* 1993 Aug;9(27):8-12. Article in French.
17. Popkin BM, Guilkey DK, Akin JS, Adair LS, Udry JR, Flieger W. Nutrition, lactation, and birth spacing in Filipino women. *Demography* 1993 Aug;30(3):333-352.
18. Peng Y-K, Hight-Laukaran V, Peterson AE, Pérez-Escamilla R. Maternal nutritional status is inversely associated with lactational amenorrhoea in Sub-Saharan Africa: results from demographic and health surveys II and III. *J Nutr*

- 1998 Oct;128(10):1672-1680.
19. World Health Organization Task Force on Methods for the Natural Regulation of Fertility. The World Health Organization Multinational Study of Breast-feeding and Lactational Amenorrhea. II. Factors associated with the length of amenorrhea. *Fertil Steril* 1998 Sep;70(3):461-471.
  20. Hight-Laukaran V, Rutstein SO, Labbok MH, Ballard E. Contraceptive use during lactational amenorrhea. *Int J Gynaecol Obstet* 1996 Aug;54(2):101-108.
  21. Vural B, Vural F, Erk A, Karabacak O. Knowledge on lactational amenorrhoea and contraception in Kocaeli, Turkey. *East Afr Med J* 1999 Jul;76(7):385-389.
  22. Treffers PE. Breastfeeding and contraception. *Ned Tijdschr Geneesk* 1999 Sep;143(38):1900-1904. Review. Abstract. Article in Dutch.
  23. Huffman SL, Ford K, Allen H, Streble B. Nutrition and fertility in Bangladesh: breastfeeding and postpartum amenorrhea. *Popul Stud* 1987;41:447-462 .
  24. Howie PW, McNeilly AS, Houston MJ, Cook A, Boyle H. Effect of supplementary food on suckling patterns and ovarian activity during lactation. *Br Med J (Clin Res Ed)* 1981 Sep;283(6294):757-759.
  25. Ravera M, Ravera C, Reggiori A, Cocozza E, Cianta F, Riccioni G, et al. A study of breastfeeding and the return of menses in Hoima District, Uganda. *East Afr Med J* 1995 Mar;72(3):147-149.
  26. Campbell OM, Gray RH. Characteristics and determinants of postpartum ovarian function in women in the United States. *Am J Obstet Gynecol* 1993 Jul;169(1):55-60.
  27. Zohoori N, Popkin BM. Longitudinal analysis of the effects of infant-feeding practices on postpartum amenorrhea. *Demography* 1996 May;33(2):167-180.
  28. No authors listed. Contraception during breastfeeding. *Contracept Rep* 1993 Nov;4(5):7-11.