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Full Length Research Paper

Understanding the Lactational Amenorrhea Method: Awareness, Knowledge, and Practices Among Breastfeeding Mothers with Unintended Pregnancies

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This study assessed the awareness, knowledge and practice of lactational amenorrhoea method (LAM) of post partum contraception among breast feeding mothers of 18 to 40 years of age with unintended pregnancies. It was a cross-sectional, multicenter survey of seventy one breast feeding mothers with unintended pregnancies who visited these health centers for antenatal care within the study period. These women had been on LAM as the only post partum contraception before onset of pregnancy. A two section, semi-structured, self administered questionnaires were used to survey the participants. The incidence of unintended pregnancy was 14.3% among LAM users. There was a high level of awareness, but poor knowledge and practice among users. Lactating pregnant women who properly implemented only one component had more than 4 times odds for unintended pregnancy (odd ratio (OR)=4.12, confidence interval (CI)=3.21 to 4.72, P=0.04), those who implemented two components had about 3 times odds for unintended pregnancy (OR=2.82, 95%CI=2.54 to 2.94, P=0.01), while those who did not implement any of the three components had more than 7 times odds for unintended pregnancy (OR=7.52, 95%CI=7.23 to 7.94, P=0.001). High incidence of unintended pregnancy observed in this study was associated with poor knowledge and aberrant-practice of LAM by breast feeding mothers. Therefore, improving women knowledge (especially breast feeding mothers) on the proper guidelines of LAM could be of a great help in reducing high incidence of unintended pregnancy among LAM users.

Key words: Knowledge, practice, lactational amenorrhoea method (LAM), unintended pregnancy.

INTRODUCTION

Unintended pregnancy is currently one of the greatest challenges faced by women of reproductive age in most developing countries of the world (Singh et al., 2010). It has become a public health concern in some countries like Nigeria, because its effects are not limited to women, but also the families and the society. It has negative economic, educational and social consequences for both the family and the nation (Dixit, 2012).

Although, family planning and reproductive health programs have contributed immensely to a global decline in the incidence of unintended pregnancy; however, the rates are still very high in some developing countries (Leete et al., 1999). This could be attributed to none/ inappropriate use or failure of the birth control methods of choice (Huang et al., 2012). Epidemiological studies suggest that post partum women are among the most highly vulnerable to unintended pregnancy (Huang et al., 2012),

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probably because many of them worldwide lack access to, or do not wish to use hormonal contraceptive methods for fear of transmission of exogenous hormones to the infant.

Attempts to provide fertility awareness-based method of family planning to breastfeeding women led to the development of lactational amenorrhoea method (LAM) of post partum contraception, which is the practice of using breastfeeding to prevent pregnancy. For this method to be effective, the following three basic criteria must be met: using the method within the first six months post delivery; when menstruation has not returned; and the mother is exclusively breastfeeding (that is, the infant is breastfed frequently throughout the day and night; every 4 h during the day and every 6 h during the night, with no other food or beverage). For a breastfeeding mother to be eligible to use LAM, she must satisfy the three aforementioned criteria (Labbok et al., 1994).

There is a growing amount of evidence that, when used perfectly (correct and consistent), LAM provides 98 to 99% contraceptive effectiveness, while typical use (incorrect and inconsistent) provides 95% effectiveness (Kazi et al., 1995; Trussell, 2004). This means that 5 of 100 women who used LAM typically may become pregnant unintended within the first six months post-partum, whereas less than 1 to 2 may become pregnant within the same period with perfect use. A higher rate of unintended pregnancy is found among defaulters who are unable to adhere strictly to the tenets for the proper use of LAM as approved by World Health Organization (WHO) and entrenched in the “Bellagio Consensus” in Italy in 1995 (WHO, 2004). While very few women may choose to carry the unintended pregnancies to term, a greater number of them may opt for abortion to avoid risk of their lives and health, psychological trauma and socio-economic turmoil. Of the estimated 210 million pregnancies that occur throughout the world each year, about 38% are unintended, 22% of unintended pregnancies end in abortion (Amin et al., 2009). Worse still where there is lack of access to safe abortion, the women’s health is endangered especially if they resort to unsafe methods to terminate their pregnancies. It is stated that 19 million of the estimated 46 million induced abortions each year are performed in unsafe conditions and/or by unskilled providers and result in the death of an estimated 68,000 women. This represents 13% of all pregnancies related death (The Alan Guttmacher Institute (AGI), 1991). Almost all unsafe abortion takes place in developing countries, and is where 99% of abortion related deaths occur (US CDC, 2003; WHO Report, 2004).

Previous studies have shown that the problem of unsafe abortion is more in Sub-Saharan Africa due to limited uptake of family planning, a shift towards the use of traditional contraceptive methods instead of modern methods, decreased effective use of contraception (Fatima et al., 2005), highly restrictive abortion laws and poor access to safe abortion services. In Nigeria, unintended pregnancy and unsafe abortion are critical public health problems (Onche, 2011). An estimated one in five pregnancies in Nigeria is unintended, because of low knowledge and practice of contraception, desire for smaller families, growing urbanization, increase participation of women in paid labour force and diminish ability of families to support many children (Akinrinola et al., 2006). For those women who may want to maintain the unintended pregnancy, they may face a lot of adverse social and economic impact on the family. The women’s hope for better life for herself, education and prosperity for her family may be marred by unintended pregnancy (Etuk and Ekanem, 2003). Increased incidence of family disharmony is common, increased incidence of child abandonment (child neglect), battered baby syndrome, juvenile delinquency and increased number of street children are also associated with unintended pregnancies (Etuk and Ekanem, 2003).

Special attention should therefore be focused on breastfeeding mothers who still want to fulfill their marital obligations to their spouses but are ignorant of an ideal contraceptive method during lactation. The fear of effect of the hormonal contraceptives on the breastfeeding baby left them with no choice than to choose LAM which is natural, readily available, cheap and the easiest. For this method to be effective, the three basic criteria must be strictly adhered to.

This study was therefore carried out as one of the initiatives to reduce the incidence of unintended pregnancy among women practicing LAM in Uyo Metropolis, South-South Nigeria. The aim was to establish the knowledge and practice of LAM by breastfeeding mothers with unintended pregnancies due to LAM or users’ failure. We hope that the outcome of this study will help unfold the required interventions necessary to improve the quality of LAM services and reduce complications associated with unintended pregnancies, unsafe abortion in our community and similar communities in other parts of the world.

SUBJECTS AND METHODS

Selection of participants

This was a cross-sectional multi-center survey conducted in two secondary and eight primary health care facilities within Uyo Metropolis in South-South Nigeria. Of the 3720 pregnant women (aged 18 to 40 years) who visited these health facilities for ante-natal care within the study period (between April 2010 and June 2011), 497 (14.6%) had unintended pregnancy. Pregnancies were grouped as either intended or unintended at conception using new definitions established by the Institute of Medicine in 1995. Pregnancies were considered intended if a woman had stopped using birth control measures, because she wanted to become pregnant. Unintended pregnancies were classified as either mis-timed: wanted pregnancies that occurred sooner than desired or unwanted pregnancies that occurred while a woman was using contraception and had not ever wanted to have another baby. Seventy

Table 1. Distribution of breastfeeding mothers (n= 3,720).

Participants	n	%
Those initially excluded	305	8.2
Actual participants	3415	91.8
Intended pregnancy (Excluded)	2918	85.4
Those with unintended pregnancy	497	14.6
Unintended pregnancy not on family planning (Excluded)	340	68.4
Unintended pregnancy on LAM (Included)	71	14.3
Methods other than LAM (Excluded)	76	15.3
Intention to terminate the pregnancy	10	2.0

one (14.3%) of them claimed they were on LAM, and were included in the study. Those who practiced other forms of post partum contraception were illegible to participate. Written informed consent was obtained from each participant and the study protocol was approved by the institutional research and ethics committee.

Assessment measures

A two section semi-structured questionnaire developed by the authors based on prior studies on the practice of LAM (Khadiga et al., 1996; Hight-Laukaram et al., 1996; Brogen et al., 2006) was used to survey the participants. The first part of the questionnaire contained 10 open ended questions aimed at obtaining information on the socio-demographic characteristics of the participants such as age (years), education level, employment status, type of family, religion, ethnicity, marital status, parity and area of residence.

Based on age, participants were classified into four groups: they were also classified into low and high education levels to represent participants with up to high school and more than high school education, respectively. Also, based on employment status, family type, religion, ethnicity and marital status, were classified into employed and unemployed, extended and nuclear family, Christians and non-Christians, Ibibios and non-Ibibios and married and singles, respectively.

The second part of the questionnaire contained 17 questions aimed at obtaining information regarding respondents' level of awareness, knowledge and practice of LAM. To assess their level of awareness, open ended questions were asked. These included questions such as: are you aware of the fact that exclusive breast feeding could be used to prevent pregnancy? How did you learn about it and how would you grade your acceptance of the practice?

To assess participants' knowledge, question were asked to assess their understanding of the meaning of LAM, the basic criteria for the effective and full implementation of LAM such as, when it should be commenced and ended, its effectiveness after weaning, provision of protection against sexual transmitted infections, effects on infants' and mothers' health and also the benefits and adverse health outcomes when practiced properly. To assess respondents' practice of LAM, questions were asked to find out the components of LAM actually implemented by them. On this basis, respondents were classified into four groups: those who could not implement any of the three basic criteria, those who implemented only one, two or all three components. For the purpose of this survey, lactational amenorrhoea post partum contraception is defined as the practice of using breast feeding to prevent pregnancy during post partum period. The three basic criteria for its full implementation include the following: exclusive breast feeding, post partum amenorrhoea and less than six months since child birth.

Respondents who observed only one, two or all components were regarded as having implemented one, two or all components, respectively.

Statistical analysis

Frequencies and simple percentages were computed for categorical variables. Chi-square test was used to compare the number of women with unintended pregnancy with each level of the demographic variables as well as the number of breastfeeding women with unintended pregnancy with correct and incorrect responses on the knowledge of LAM. Moreover, the number of components of LAM properly implemented by these women was compared statistically using chi-square test. Finally, logistic regression between cases of unintended pregnancies and implementation of LAM guidelines were performed. Odds ratio (OR) and its corresponding 95% confidence interval (CI) were estimated. All statistical computations were enhanced using Statistical Package for Social Sciences (SPSS) 17.0. A probability value less than 0.05 ($P<0.05$) was considered to be statistically significant.

RESULTS

Of the three thousand seven hundred and twenty (3,720) pregnant women recruited for the study, 305 (8.2%) were initially excluded for failure to comply with research guidelines. This made actual participants to be 3,415 (91.8%). Four hundred and ninety-seven (14.6%) of the participants had unintended pregnancies, 71 (14.3%) of the 497 pregnant women who had unintended pregnancies were on LAM and hence constituted the study participants; all others were excluded from the study. Detailed results are shown in Table 1.

In addition, 3 (4.2%) of those who were on LAM were between ages of 18 and 24, 23 (32.4%) were between the ages of 25 and 30, 36 (50.7%) were between the ages of 31 and 35 and 9 (12.7%) were between the ages of 36 and 40 years. Most of the women had high education (66.2%), employed (71.8%), from nuclear family (62.0%), Christians (95.8%), were of Ibibio ethnicity (50.7%) and resides in the urban (60.6%) and multiparous 56 (78.9). Results are shown in Table 2.

Most participants accepted the method at first contact with the medical staff that happens to be the first source

Table 2. Demographic characteristics of breast feeding mothers on LAM, n=71.

Demographic characteristic	n (%)
Age	
18-24	3 (4.2)
25-30	23 (32.4)
31-35	36 (50.7)
36-40	9 (12.7)
Education	
High education	47 (66.2)
Low education	24 (33.8)
Employment	
Unemployed	20 (28.2)
Employed	51 (71.8)
Type of family	
Extended	27 (38.0)
Nuclear	44 (62.0)
Religion	
Christians	68 (95.8)
Muslim	3 (4.2)
Ethnicity	
Ibibios	35 (49.3)
Non-Ibibios	36 (50.7)
Area of residence	
Rural	28 (39.4)
Urban	43 (60.6)
Marital status	
Married	55 (77.5)
Single	7 (9.9)
Devoiced	9 (12.7)
Parity	
1	15 (21.1)
2-4	21 (29.6)
>7	35 (49.3)

of the information to majority (56.3%) of them. Others got the information from their relatives (25.4%), in school (12.6%) and from their friends (5.6%) as shown in Table 3.

About 57.5% of lactating mothers with unintended pregnancies who practiced LAM did not know its full meaning. Only 36.6% knew the three basic criteria for LAM use. About 71.6% did not know how LAM works and only 56.3% knew the optimum breastfeeding behaviors that help maximize the contraceptive effect of LAM. Appropriate take off time and the duration for optimum contraceptive effect were known by 45.1 and 51.8%, respectively. Also, 54.6% knew that the effectiveness of LAM decline after weaning. Good knowledge of the absence of adverse health effect on the mother, baby and absence of protection against sexually transmitted infections (STIs) for users was shown by 39, 50.7 and 78.9% respondents, respectively. However, the benefits and adverse effect of LAM were known by 31 (43.7%) and 16 (22.5%), respectively. Results are shown in Table 5.

Analysis of the components of LAM properly implemented by respondents showed that 8 (11.3%) implemented exclusive breast feeding only, 13 (18.3%) were amenorrhiec, 10 (14.1%) were less than 6 months post partum. Moreover, 9.8% implemented exclusive breastfeeding and were amenorrhiec, whereas 16.9% implemented exclusive breast feeding and were less than 6 months post partum. 12.7% were amenorrhiec and less than 6 months post partum, 10 (14.4%) implemented all the components. The remaining 2 (2.8%) implemented none of the three components. Results of analysis also revealed that the number of pregnant women who implemented these three components were significantly lower than those who implemented one or two of the components effectively (P<0.001). Results are shown in Table 5.

Finally, pregnant women who implemented only one component had more than 4 times odds for unintended pregnancy (OR=4.12, CI= 3.21 to 4.72, P=0.04), those who implemented two components had about 3 times (OR=2.82, 95%CI= 2.54 to 2.94, P=0.01) while those who did not implement any of the three components had more than 7 times odds for unintended pregnancy (OR=7.52, 95%CI= 7.23 to 7.94, P=0.001). Results are shown in Table 5.

DISCUSSION

In this study, the incidence of unintended pregnancy among lactating mothers practicing LAM was 14.3%. This value is relatively lower than values obtained in previous studies within and outside Nigeria. Etuk and Ekanem (2003) recorded 30% incidence of unintended pregnancy in a similar survey in Calabar, Nigeria. In Egypt, the incidence of unintended pregnancy among LAM users was 29% (Omar and Anna 2008), while in Turkey, the incidence was recorded as 32.8%. The differences observed here could probably be due to variations in some socio-demographic variables among the different populations under study. In the present study, most of the participants (83%) were highly educated, married (77.5%), multiparous (78.9%) and between the ages of 31 and 35 years (50.7%). These attributes have been consistently

Table 3. Sources of information on LAM.

Item	Number	%	Item	Number	%
Had been informed about LAM			**Mother's reaction to the information**		
Yes	71	100	Accepted	71	100
No	0	0	Rejected	0	0
Sources of information about LAM			**First person to inform about LAM**		
Medical staff	40	56.3	Medical staff	40	56.3
Relative	18	25.4	Relatives	18	25.4
In school	9	12.7	In school	9	12.6
Mass media	0	0	Friends	4	5.6
Friend	4	5.6	Mass media	0	0

Table 4. Knowledge about LAM by users.

S/No.	Question	Correct response (%)	Incorrect response (%)	P-value
1	What is the meaning of LAM?	30 (42.3)	41 (57.5)	0.192^{NS}
2	What are the basic criteria for the effective use of LAM?	26 (36.6)	45 (63.4)	0.024*
3	The effectiveness of LAM expires when?	36 (50.7)	35 (49.3)	0.906^{NS}
4	When can LAM start?	32 (45.1)	39 (49.3)	0.406**
5	Does the mother who practices LAM need to stay close to the baby?	40 (56.3)	31 (44.3)	0.690^{NS}
6	How does LAM work?	18 (25.4)	53 (71.6)	0.285^{NS}
7	Can LAM continue after weaning?	39 (54.6)	23 (32.4)	0.042*
8	Does LAM provide protection against STIs?	56 (78.9)	15 (21.1)	0.00**
9	How effective is LAM?	30 (42.3)	41 (57.8)	0.192^{NS}
10	Does the use of LAM affect infant's health?	36 (50.7)	35 (45.3)	0.906^{NS}
11	Does the use of LAM affect mother's health?	28 (39.4)	43 (60.6)	0.075^{NS}
12	What are the good effects of LAM?	31 (43.7)	40 (56.3)	0.285^{NS}
13	What are the bad effects of LAM?	16 (22.5)	55 (77.5)	0.00**

**P<0.01, significant at 1%; *P<0.05, significant at 5%; ^{NS}P>0.05 not significant at 5%.

Table 5. Distribution of LAM components property implemented by breastfeeding mothers with unintended pregnancies.

LAM component	N (%)
1 only	8 (11.3)
2 only	13 (18.3)
3 only	10 (14.1)
1 and 2	7 (9.8)
1 and 3	12 (16.9)
2 and 3	9 (12.7)
1, 2 and 3	10 (14.1)
None	2 (2.8)

Values in the parenthesis are percentages. Components: 1 = exclusive breastfeeding, 2 = absence of menstruation (amenorrhoea), 3 = less than 6 months post partum.

shown in previous surveys to improve knowledge and practice of LAM among users. Thus, in a study carried out by Susu et al. (1996), it was found that contraceptive knowledge and practice was positively influenced by education level, parity, marital status and age of users. This corroborates findings by Sandra et al. (1987) in a Bangladeshi study. These attributes were more prominent in the present study population than the aforementioned.

Also, the failure rate recorded in this study and others are significantly higher than the internationally accepted values of 1 to 2% on effective use and 5% on typical use of the method (Kazi et al., 1995). This is probably because these studies have some common features, which include poverty of knowledge and aberrant practices of LAM by users. Poor knowledge of the method, and incorrect practices by users were among the key factors identified as being responsible for the high failure rate of LAM recorded in prior studies (Valdes et al., 2000; Miriam et al., 1997).

In a study in Northern Nigeria, Audu et al. (2006) observed low level of awareness of LAM among users

Table 6. Logistic regression between the component implemented and the likelihood of having unintended pregnancies (odds ratio and 95% confidence interval).

LAM implementation	OR	95% CI	P
Number of component implemented	1.0	-	-
3 components	2.0 (reference)	-	-
2 components	3.0 2.82	2.54-2.94	0.01*
1 component	4.12	3.21-4.72	0.04*
0 component	7.52	7.23-7.94	0.001**

Adjusted for socio-demographic characteristics and post partum maternal behaviors. *P<0.005, significant at 5%; **P<0.01, significant at 1%.

(42.1%), poor utilization and wrong use of the method. These contributed to the high incidence of LAM failure according to that survey. A similar study in Turkey demonstrated low knowledge of LAM by users, more than half (52%) were not aware of the contraceptive property of breastfeeding, 48.16% did not know the importance of frequency and duration of sucking on efficacy of LAM (Vural et al., 1999). Another survey in Turkey by Turk et al. (2010) showed that only 17.2% of women using LAM fulfilled the LAM criteria and 82.8% did not. Two of the three criteria necessary for LAM to be effective were not met by users. These include absence of menstruation within the first six months (43.8%) and exclusive breastfeeding (70.3%).

Similar poor knowledge was observed among users of LAM in the present study. Fifty-seven percent of them did not know the full meaning of LAM. Forty-four percent were ignorant of the optimal breastfeeding behaviors that help maximize LAM efficacy. Fifty-five percent did not know the take-off time and duration, while 46% were ignorant of the effect of weaning and the time when LAM should be switched over to another method or addition of a complementary contraception. Consistent with present finding, Brogan et al. (2006) in their study in India found that only 47.6% of the respondent knew the tenets for effective practice of LAM.

A discordant result was obtained by Miriam et al. (1997) in a multi-center study. In that study, a good level of awareness and practice with 98% efficacy of LAM was recorded. That result yielded insight on the possibility of continuing the use of LAM beyond six months. LAM was found to be highly effective as an introductory post-partum method when offered to a variety of cultures, healthcare settings, socio-economic strata and industrial and developing country locales. The parameters studied in that survey yielded high efficacy, and the basic tenets of the 1995 Bellagio consensus on LAM was re-confirmed. LAM was therefore recommended for incorporation into hospitals, maternity, family planning, maternal and child health and other primary healthcare setting (Miriam et al., 1997).

The present study also revealed the aberrant practices among LAM users. Only 14.1% actually implemented the three components of LAM. About 2.8% did not implement even one component, while 43.7 and 39.4% implemented 1 and 2 components, respectively. Results of multiple logistic regression analysis showed that those who implemented only one component had 4 times odds for unintended pregnancy while those who implemented two components had 3 times likelihood of having unintended pregnancy. Those who did not implement even one component had about 7 times odds for unintended pregnancy.

Earlier studies have shown that the socio-demographic characteristics of the study population are factors to be considered in assessing the knowledge and practice of LAM and associated incidence of unintended pregnancies. Compelling evidences have shown that occupation outside home (employed) and previous awareness of LAM emerge as predictors of its acceptance (Vural et al., 1999; Khella et al., 2004). This has reflected in the present study, most participants (71.8%) were employed and virtually all of them were previously aware of LAM. Majority of them got the information from their physicians while others were either informed by their friends or relations. Existing research indicates that these two factors can impact a negative influence on the practice of LAM. Studies have shown that occupation outside home has encouraged passive practice of LAM. Even when practice of expressed breast milk is intensified, the natural sucking stimulus that initiate the signal that result in suppression of fertility is absent. The sucking stimulus is regarded as a major behavioral and physiological parameter that account for the variation in the timing of return of fertility. One study showed that mothers who were separated from their infants (but expressed milk to provide 100% breast milk for their babies) had a higher pregnancy risk (5.2%) during the first 6 months (Valdes,

2000), while another study demonstrated that mothers who practiced exclusive breastfeeding had a zero chance of being pregnant during the first 3 months, less than 2% between 3 and 6 months, and about 6% after 6 months (assuming the menstrual periods have not yet returned (Jen O'Quinn, 1998, 1999).

Review of literatures revealed that in areas where breastfeeding is practiced physiologically, that is, frequently, day and night with little or no supplementation given, the continuous breast feeding after menses had returned was associated with significant continued delay in fertility. Such is unrealistic in a breast feeding mother in a job outside home. A high rate of unintended pregnancy among our respondents is therefore substantiated, as majority of them were employed. In conflict to these findings, Miriam et al. (1997) observed that LAM was effective in all settings, even when exclusive breastfeeding may not be fully implemented, but the most important factor according to that survey was the duration of each breastfeeding. Also, studies have shown that previous knowledge of LAM does not guarantee its active practice. This was the observation in the Republic of Kazakhstan (a member of Soviet Union) intervention studies. Knowledge of LAM as a contraceptive method was high among study participants interviewed after delivery, and 70% of all women reported that they planned to use LAM as protection from unintended pregnancy. However, correct knowledge about the method was very low. Only 35% of the women knew all the three criteria for effective LAM use. A follow-up study revealed that among the LAM users who became pregnant post-partum, none of them knew all the three criteria for successful LAM implemented (Shamil et al., 2004).

A high incident of unintended pregnancy was recorded among participants in the present study despite the fact that they were all previously informed about the method. This therefore underscores the important of effective practice of LAM if its efficacy is to be maximized. Other contributing factors observed in this study were: maternal age, education level, marital status, religion, parity and area of residence. Most respondents (98%) were within the ages of 20 and 40 years, and this appears to be the most sexually active and fertile age bracket. This corroborates the findings by Akinrinola et al. (2006), who observed that more than one quarter (27%) of all Nigerian women fell within similar age bracket and this appears to be the peak age for sexual exuberant and fertility. They observed that women in this age bracket do not want many children soon, but were unwilling to use contraception.

Consistent with the findings in the present study, Sandra et al. (1987) observed that the median duration of amenorrhea was less in high educated than low educated women, which could have accounted for the higher failure rate of LAM among the highly educated participants. Even though some population professionals have accepted that LAM is too difficult for women to learn and apply correctly (Bracher, 1992; Trussell and Santow, 1991), but no basis for this assertion has ever been provided. It seems logical to suppose that it will not be too difficult for a population made of highly educated women to learn and implement LAM properly. However, effect of other confounders should be considered; this is probably why LAM failed in a study population that is made up of highly educated participants such as ours.

With regards to the effect of marital status on practice of LAM, married mothers were more likely than the unmarried ones to violet the tenets of LAM; this could be explained by the fact that married lactating mothers are found to engage in more sexual activities with their husbands to fulfill their marital obligations than the unmarried ones (Ndifon et al., 2006). Also, previous studies have shown that one in every two married lactating women would not want a child soon or wanted no more children, but were not using a contraceptive method effectively or use tradition contraceptive methods (Fatima et al., 2005). These contradict the findings by Ermalynn et al. (1996). Also, ethnic variation in practice of LAM as observed in the present study, corroborates the finding in prior studies (Wiemann et al., 1998; Novotny et al., 2000; Li and Grummer-Strawn, 2004), and may reflects the heterogeneity in culture/norms with regards to contraception.

Conclusion

High incidence of unintended pregnancy observed in this study was associated with poor knowledge and aberrant-practice of LAM by breast feeding mothers. Therefore improving women knowledge (especially breast feeding mothers) on the proper guidelines of LAM could be of a great help in reducing high incidence of unintended pregnancy among LAM users.

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REFERENCES

Amin SF, Howden CP, Peyman N (2009). A comparison study: risk factors of unplanned pregnancies in a group of Iranian and New Zealander women. Eur. J. Sci. Res. 26(1):108-121.

Audu BM, Yahya S, Bassi A (2006). Knowledge, attitude and practice of natural family planning methods in a population with poor utilization of modern contraceptives. J. Obstet. Gynaecol. 26(6):555-60.

Akinrinola B, Boniface A, Susheela S, Isaac F, Deirdre W, Gilda S, Rubina H (2006). Unwanted pregnancy and consequences. New York Guttmacher Institute.

Bracher M (1992). Breastfeeding, lactation infertility, contraception and the spacing of births: implications of the Ballagio Consensus Statement. Health Transition Rev. 2:19-47.

Brogen Ak, Hmingthan U, Anichari T, Achouba T, Singh WN (2006). Knowledge and Attitude on Lactational amenorrhea method as a contraceptive Device among Nursing student. Indian J. Community Med. 31:(2). Available at: http://www.indmedicua.com/journalid=>&issued=73&articleid=931&acti.com.

Dixit P, Ram F, Dwivedi LK (2012). Determinants of unwanted pregnancies in India using matched case-control designs. BMC pregnancy and childbirth 12: 84.

Ermalynn Mk, Gene CA, Margeret EE, Lydia F (1996). Social status, Mother-infant Time Together and Breast feeding Duration. J. Human lactation 12(3):201-206.

Etuk SJ, Ekanem ED (2003). Knowledge attitude of practice of family planning amongst women with unplanned pregnancy in Calabar – Nigeria. Niger. J. Physiol. 18(1-2):65-7.

Fatima J, Josefina C, Susheela S, Rubina H (2005). The incidence of induced Abortion in the Philippines: Current level and recent Trends. Int. Fam. Plann. Perspectives 31(3):140-149.

Huang YM, Merkatz R, Kang JZ, Roberts K, Hu XY, DiDonnato F, Sitruk-Ware R, Cheng LN (2012). Post partum unintended pregnancy and contraception practice among rural to urban migrant women in Shanghai. Contraception 89(6):731-738.

Institute of Medicine (Committee on unintended pregnancy) (1995). The best intentions: unintended pregnancy and the well-being of children and families. National Academy Press, Washington DC.

Jen O'Quinn, (1998). Natural child spacing and breastfeeding. Leaven 34(6):126.

Kazi A, Kennedy KI, Visness CM, Khan T (1995) Effectiveness of lactational amenorrhea method in Pakistan. Fertil. Steril. 64(4):717-723.

Khadiga AK, Hoda YA, Faten AK, Randa MY (1996). Determinants of the duration of lactational amenorrhoea among mothers in Alexandria. Eastern Mediterr. Health J. 2(3):396-406

Labbok MH, Cooney K, Coly S (1994). Guidelines: breast feeding, family planning and the Lactational Amenorrhoea method- LAM. Georgetown University, Institute for Reproductive Health. Washington DC.

Leete R, Alam I (1999). Asia's demographic miracle: 50 years of unprecedented change. Asia Pac. Popul. J. 14:9-20.

Li RW, Grummer-Strawn L (2004). Racial and ethnic disparities in breastfeeding among United States infants: Third National Health and Nutrition Examination Survey, 1988-1994. Birth 29(4):251-257.

Miriam HL, Virginia HL, Peterson E, Veronica F, Helena VH, Paul FA, Von L (1997). Multicenter study of lactation Amenorrhea Method (LAM): efficacy, duration and implication for clinical application. Contraception 55(6):327-336.

Ndifon WO, Ogaji DS, Etuk SJ (2006). Sexuality, Contraception and unintended pregnancy among female student Nurses in Calabar, Nigeria. Benin J. Postgraduate Med. 8(1):12-21

Novotny R, Hla MM, Keiffer EC, Park CB, Mor J, Thiele M (2000). Breastfeeding duration in Hawaii. Birth 27:91-96

Omar MS, Anna F (2008). Pregnancy during breastfeeding in rural Egypt. Contraception 77(5):350-354.

Onche O (2011). Expert Unveil the cost Effective, Safe Abortion Method. Available from: http://allafrica.com/stones/201101060325.htm

Sandra LH, Kathleen F, Hubert AA, Peters (1987). Nutrition and fertility in Bangladesh: breastfeeding and post-partum. Amenorrhea Popul. Stud. 41(3):447-462.

Shamil T, Toregeldy S, Ayan E, Oksana D, Orynkul M, Aina San Raikhank (2004). Promotion of Lactational Amenorrhea Method Intervention Trial, Kazakhstan Academy of Preventive Medicine. Republic of Kazakhstan. USAID.

Singh S, Sedge G, Hussain R (2010). Unintended pregnancy: worldwide levels, trends and outcomes. Studies in family planning 41(4):241-250.

Susu B, Ransjö-Arvidson AB, Chintu K, Sundström K, Christensson K. (1996). Family planning practice before and after childbirth in Lusaka, Zambia. East Afr. Med J. 73(11):708-13

The Alan Guttmacher Institute (1991). Sharing Responsibility: Women, Society and Abortion Worldwide. Alan Guttmacher Institute. New York.

Trussell J (2004). Contraceptive failure in the United States. Contraception 70(2):89-96.

Trussell J, Santow G (1991). Is the Bellagio Consensus Statement on the use of contraception sound public-health policy? Health Transit. Rev. 1:105-107.

Turk R, Terzioglu F, Eroglu K (2010). The use of lactational amenorrhea as a method of family planning in Eastern Turkey and influential factors. J. Midwifery Health 55(1):1-7.

U.S Centers for Disease Control and prevention (2003). Mortality and Mobility weekly review Surveillance Summaries.

Valdes V, Labbok MH, Pugin E, Perez A (2000). The efficacy of lactation amenorrhea method (LAM) among working women. Contraception 62(5):217-219

Vural B, Vural F, Erk A, Karabacak O (1999). Knowledge on Lactation amenorrhea and contraception in Kocaeli Turkey. East Afr. Med. J. 76(7):385-9.

Weimann CM, Dubois, JC, Berenson AB (1998). Racial/ethnic differences in the decision to breastfeed among adolescent mothers. Pediatrics 11:1-8.

WHO (2004). Unsafe Abortion: Global and regional Estimate of the incidence of unsafe abortion and associated mortality in 2000, 4th ed. WHO, Geneva.