

Breastfeeding Knowledge and Behavior in Lactational Amenorrhea Method (LAM) as a Natural Contraceptive

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Abstract

The lactational amenorrhea method (LAM) is a natural contraceptive that is highly effective after the three essential criteria are fulfilled. However, there is a significantly low adoption resulting from poor knowledge and correct practices. This study aimed to determine the correlation between knowledge and behavior of breastfeeding mothers on breastfeeding as a natural contraceptive. This was an analytic observational study with a cross-sectional design involving 89 breastfeeding mothers and was performed from January to March 2018. Furthermore, data were collected using a questionnaire, and the results showed knowledge of breastfeeding mothers to be good (59.6%) and not good (51.7%). However, the individual's behavior towards the implementation of LAM was not good (48.3%) and good (40.4%). Based on the statistical test, there was a correlation between knowledge and behavior of breastfeeding mothers, with a p-value of 0.006 (OR = 3.463; 95% CI = 1.411 – 8.498). In brief, knowledge of LAM amongst the participants is good, despite the poor application in terms of behavior. Also, a relationship was also established between the knowledge and behavior of breastfeeding mothers as a natural contraceptive.

Keywords: behavior, breastfeeding, knowledge, lactational amenorrhea

Introduction

A healthy, happy, and prosperous family is the dream of every family to produce quality families through family planning programs. The form of family planning program is the use of contraceptives. Contraception involves methods which potentially used to prevent pregnancy.¹ Making the right choice will help improving the health and well-being of individuals, families, and communities.² This selected method is carried out immediately after childbirth because most women aspire to limit their pregnancy.³ The contraceptives commonly used include pills, injectables, implants, intrauterine devices, condoms, vaginal rings, patches, male and female sterilization, spermicides and diaphragms, cervical caps, lactational amenorrhea methods, withdrawal, and fertility awareness-based methods.¹ Moreover, contraception has some advantages; preventing unwanted pregnancies, avoiding pregnancy, and reducing morbidity and maternal mortality.² These are also used as a driving factor to maintain women's health and socioeconomic well-being.⁴

Mothers must prepare early in making decisions about their pregnancy to avoid the risk of unwanted preg-

nancy due to contraceptive failure. Moreover, statistics have shown the existence of over 74 million unwanted pregnancies every year in developing countries, and 30% were attributed to contraceptive failure.⁵ These malfunctions are mainly due to the user's young age and low economic status,⁶ as well as the adoption of incorrect and inconsistent methods. In addition, age, education, family income, marital status, and contraceptive method type have also been identified.⁷ These failures are significantly common amongst quitting acceptors, as recorded by Surayya, *et al.*⁸ This dropout attitude is caused by some factors, including age, family planning history, and side effects.⁹ Moreover, natural family planning methods are also considered an option by mothers and couples intending to avoid or minimize the side effects of contraceptives.¹⁰

Natural family planning is an option for couples who committed not to use hormonal contraceptives or devices. Commitment and motivation with the partner are very important for the successful use of natural family planning. The three natural family planning methods including fertility awareness-based, lactational amenorrhea

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method (LAM), which is discussed in this study, and withdrawal methods.¹¹ Particularly, the LAM is a contraceptive technique involving exclusive breastfeeding. This technique is characterized by the advantages of being safe, helping delay menstruation, supporting exclusive breastfeeding, and preventing pregnancy.¹² Furthermore, other benefits include improving the mothers' ability to provide exclusive breastfeeding, pregnancy prevention, cost-effectiveness, ease of performing, and natural. Also, LAM does not require drugs or devices, and interferes with body hormones and sexual intercourse. This provides protection and serves as an alternative method for women searching for ways where barriers, including diaphragms, cervical cap, male condom, spermicide foam, and sponge, are not used.¹³

Moreover, an understanding of breastfeeding as a contraceptive method has been established at the Bellagio consensus, Italy, since 1988. This consensus brought together an international interdisciplinary study group in lactation infertility to discuss LAM as an effective and safe contraception method. The consensus results showed a 98% chance of protection against pregnancy and amenorrhea in the first six months after childbirth, under the circumstances where the mother practices direct breastfeeding.¹⁴ The study by Tiwari, *et al.*,¹⁵ highlighted the absence of any conception amongst breastfeeding mothers within the first six months postpartum. This indicates the propensity to adopt LAM as a natural contraceptive method, which is very effective for mothers engaged in exclusive breastfeeding for the first six months postpartum.¹⁵ In addition, this approach is considered appropriate if the three LAM criteria are fulfilled.¹⁶

Breastfeeding mothers must understand the three LAM criteria so that this contraceptive method can be successful, not just breastfeeding. Three LAM criteria are including being a breastfeeding mother for up to six months after childbirth, amenorrhea, and having babies less than six months old.¹⁷ The LAM is a non-hormonal contraceptive method that is good for breastfeeding mothers,¹⁸ and knowledge of LAM and correct behavior in the application of LAM can help reduce the incidence of pregnancy among LAM users.¹⁹ Based on a study conducted in Turkey, 17% of mothers receive information about breastfeeding as a contraceptive method, 41.3% acknowledge the tendency to use breast milk as a contraceptive method, 68.9% receive information about LAM from a nurse, and 38.9% receive knowledge related to the potential side effects.²⁰ In addition to the individual understanding, it is also important to consider the mothers' behavior towards the application because incorrect execution has played a significant role in failures, and an increased possibility of pregnancy, resulting from the return of fertility.

Study conducted in Nigeria showed the use of LAM in 52% of the study participants, while 21% have substantial knowledge regarding the proper application.¹⁶ In addition, a study in rural Turkey showed high breastfeeding rates, despite the low adoption of LAM as a contraception method. This population characteristic is attributed to the non-fulfillment of one of the intrinsic criteria.²¹ The effectiveness of LAM is known to decrease with the return of menstruation. Hence, mothers are expected to immediately use another contraceptive approach when a postponement of pregnancy is needed.²²

Pregnancy can occur when the mother's fertility returns. A study by Van der Wijden and Manion stated that the pregnancy rate amongst LAM users is between 0% and 7.5%, while fully breastfeeding and amenorrheic women reported not using any contraceptive methods was 0.88%.¹² Based on preliminary studies, Indonesia is one of the largest archipelagic countries globally, with a population of 131,879,182 people. This consists of 131,879,182 and 133,136,131 females and males, respectively. In addition, most of the women are of reproductive age, comprising 70,715,592 people, and efforts are currently being made to control this population size by implementing a sustainable family planning program.²³ The estimates of contraception methods used amongst women of the reproductive age worldwide in 2019 include female sterilization was 24%, the male condom was 21%, intrauterine device (IUD) was 17%, the pill was 16%, injectable was 8%, withdrawal was 5%, the rhythm was 3%, the implant was 2%, and others were 2%.²⁴ Proportionally, the most popularly adopted technique was the three-month injections (42.4%), pills (8.5%), IUD (6.6%), one-month injections (6.1%), implants (4.7%), women's operating methods (3.1%), male condoms (1.1%), and the male operation method (0.2%).²⁵ However, the correct use of the LAM has not been well documented.

Therefore, providing substantial information is necessary to increase maternal knowledge about LAM and distinguish the correct application technique. Moreover, health workers are encouraged to record the success of mothers adopting LAM and support the realization of exclusive breastfeeding. In addition, field experience shows the poor knowledge of this method amongst a majority of the mothers. Hence, there is a need to disseminate related information from the inception of pregnancy to the postpartum period. The previous study by Mulyani, *et al.*,²⁶ highlighted the higher tendency for mothers receiving postpartum counseling about LAM from applying the contraception method because this category of women received information and support from health workers. The education provided plays an important role in influencing a mother to decide the appropriate contraception method.²⁷ These educational efforts require ini-

tial information on the individuals' understanding of the knowledge shared. However, few studies have been conducted to determine the correlation between the knowledge and behavior of breastfeeding mothers towards the application of LAM.

This contraceptive method is recommended due to the high cost-effectiveness, absence of any side effects, and the potential application by couples in need of natural techniques without any drugs or devices. Therefore, correct understanding and application are expected from postpartum mothers. Moreover, receiving support in the form of knowledge, information, and education regarding the use of natural contraceptives is essential to regulate pregnancy and respect human rights regarding the individual's choices. Therefore, this study aimed to determine the correlation between knowledge and behavior of breastfeeding mothers on breastfeeding as a natural contraceptive.

Method

This was a cross-sectional design study conducted from January to March 2018 in 'Aisyiyah Moyudan Primary Clinic, Moyudan Sub-district, Sleman District, Yogyakarta Province, Indonesia. Sleman District is known to have the highest success rates in terms of exclusive breastfeeding (81.7%), compared to Bantul (77.7%), Kulon Progo (76.3%), Gunung Kidul (68.8%), and Yogyakarta City (67.4%).²⁸ In addition, this observation is the basis of this study because LAM involves providing exclusive breastfeeding. This study involved 89 individuals from a total population of 810 breastfeeding mothers. The samples were collected through purposive sampling, based on the inclusion criteria, the participants' abilities or knowledge, and the study needs.²⁹

The inclusion criteria include mothers aged above 25 years, married women, individuals with a history of normal delivery, babies weighing over 2,500 grams at birth, babies with no abnormalities or congenital disabilities, and mothers with no breast abnormalities. However, the exclusion criteria include women with mental health disorders, a history of depression, and sufferers of severe infectious diseases. The data required were collected using the knowledge and behavior questionnaire. The knowledge questionnaire consists of 18 statements, including five statements on breastfeeding, four on breastfeeding as a contraceptive method, three on the advantage of using LAM, four on the limitations, and two focused on those eligible to use LAM. In addition, the respondent was expected to choose one of two answers for each, where "Yes" indicates a mothers' knowledge about LAM, and "No" means the absence of awareness.

The behavior questionnaire consisted of 10 statements regarding an individuals' attitude towards the application of LAM. This assessment required the respondent to

choose one of two answers for each statement, where "Yes" indicates the mother applies LAM, while "No" means otherwise. The data collected were then analyzed to determine the frequency distribution of breastfeeding mothers' knowledge. Furthermore, bivariate and multivariate analyzes were conducted to determine the statements with the most significant influence on maternal knowledge about LAM. The variables used include breastfeeding, breastfeeding as a method of contraception, the advantage of using LAM, limitations of using LAM, and an individuals' eligibility to use LAM. Therefore, knowledge and behavior were measured using the $X > \text{mean}$ value, which indicates 'good,' while $X < \text{mean}$ denotes 'not good.' The mean value is obtained by adding all the sampled data values and dividing by the number of samples.

Results

A total of 89 breastfeeding mothers were involved in this study. Table 1 shows the demographic data collected, which identified all as Muslim, with most having a last education of Senior High School (46.1%). Furthermore, the husband's most common job was an employee (45%), while the major occupation of most mothers was a housewife (61.8%). The family income per month was <2 million IDR (24.7%) and \geq 2 million IDR (75.3%). All participants were determined to know about exclusive breastfeeding based on the data collected regarding the mother's knowledge about LAM. This practice characterized by providing of breast milk to babies from birth to the age of six months without any additional food or drinks, except drugs.

Table 2 also highlights the mothers' knowledge about breastfeeding as a technique to prevent breast cancer.

Table 1. Characteristic of Breastfeeding Mothers (n = 89)

Characteristic	Category	n	%
Religion	Muslim	89	100
	Non-Muslim	0	0
Education	Elementary school	1	1.1
	Junior high school	11	12.4
	Senior high school	41	46.1
	Diploma	5	5.6
	Bachelor	31	34.8
Husband's occupation	Entrepreneur	35	39.3
	Civil servants	4	4.5
	Employee	40	45
	Farmer	5	5.6
	Teacher	5	5.6
Breastfeeding mother's occupation	Housewife	55	61.8
	Civil servants	2	2.2
	Entrepreneur	16	18.0
	Teacher	4	4.5
	Employee	12	13.5
Family income (per month)	<2 million IDR	22	24.7
	\geq 2 million IDR	67	75.3

Table 2. Frequency Distribution of Mother's Knowledge About Lactation Amenorrhea Method

Variable	Category	Yes (%)	No (%)
Breastfeeding	Exclusive breastfeeding is breast milk given from the baby born until six months without additional food or drinks other than drugs	100	0
	Breast milk is the best food for babies and cheap	93	7
	Breastfeeding can prevent breast cancer	100	0
	Breast milk protects babies from various diseases	53	47
	A sick baby should not be breastfed	49	51
Breastfeeding as a contraceptive method	Family planning is used to avoid pregnancy	92	8
	The lactation amenorrhea method (LAM) is one of the natural contraceptive methods	74	26
	Breastfeeding is a contraceptive method	76	24
	You can get pregnant if you have not used contraception	96	4
The advantage of using LAM	The LAM does not require drugs or tools	78	22
	The LAM method has high effectiveness, meaning that pregnancy rarely occurs	66	34
	The LAM method is safe to use and does not interfere with intercourse	47	53
Limitations of using LAM	The LAM is long-term contraception	66	34
	Pumping or milking can affect the performance of the LAM	35	65
	The LAM method is difficult to implement due to environmental, social, and support factors	47	53
	The LAM method protects mothers from sexually transmitted diseases (STIs) and HIV/AIDS	33	67
Someone who can use LAM	The LAM can still be used even if the mother has menstruated	38	62
	Exclusive breastfeeding mothers and mothers using additional contraception such as injections, pills, implants, intrauterine devices (IUDs), condoms for fear of pregnancy	33	67

The results showed a sufficient understanding of breast milk as the best and cheapest food for babies (93%). Also, the mothers acknowledge breastfeeding to protect babies against various diseases (53%). In addition, some participants continue this practice despite any infant illness (49%), and some tend to stop due to the fear of the baby becoming sicker (51%).

Regarding the statement about family planning as a technique used to avoid pregnancy, 92% of mothers answered "Yes," while 74% acknowledged LAM as a natural contraceptive. Moreover, 76% answered "Yes," and 24% picked "No" to the statement of identifying breastfeeding as a contraceptive method. Almost all participants agreed with the statement, "If you don't use contraception, you can get pregnant" (96%). Based on the statement that the practice of LAM contraception does not require any drugs or tools, 78% of mothers answered "Yes," indicating knowledge on how to use this method, while 22% do not know. Therefore, some participants continued to adopt other contraceptive methods, where 66% acknowledged LAM as highly effective after correct application. However, most mothers had no idea about the inability to interfere with sexual relations (53%) (Table 2).

In addition, 66% of the respondents said LAM is a long-term contraceptive. The mothers answered "Yes" to the statement of "milking or pumping breast milk can affect LAM performance" (35%), while 65% stipulated "No." Moreover, 47% answered "Yes" to knowing LAM as a difficult process resulting from environmental, soci-

al, and support factors, while 53% answered "No." To the statement about this technique not having the capacity to protect mothers from sexually transmitted diseases and HIV/AIDS, 33% answered "Yes," while 67% ticked "No."

Approximately 38% of mothers answered "Yes" to the statement of "LAM can still be used although the mother has menstruated," while 62% stated "No." This answers indicated that most participants have perceptions towards the possibility of using LAM after the onset of menstruation. In addition, 33% choose to use additional contraception because of the fear of pregnancy resulting from potential LAM failure. In the statement about the potentially reduced effectiveness of LAM after the additional use of contraception, 33% and 67% of mothers answered "Yes" and "No," respectively. In conclusion, most mothers were assumed to have sufficient knowledge on good and proper breastfeeding, alongside the potential application as a safe, inexpensive, and efficient natural contraception. Moreover, there is a need to improve the knowledge about LAM to prevent the wrong implementation.

Table 3 shows that all mothers provided exclusive breastfeeding, although 65% used other contraception in addition to LAM for the first six months after childbirth, while 35% did not. Moreover, some respondents tended to use contraception immediately after delivery, including the IUD (49%), while 15% used additional contraception for the first six months. The results showed that 31% of mothers provided breast milk using a

Table 3. Frequency Distribution of Mother's Behavior in Applying the Lactation Amenorrhea Method as a Natural Contraceptive

Statement	Yes (%)	No (%)
Exclusive breastfeeding	100	0
Contraception less than first six months after childbirth	65	35
Contraception after post placenta	49	51
Contraception first six months after childbirth	15	85
Provide breast milk using a milk bottle	31	79
Breastfeeding more than eight times/day	98	2
Menstruation after the baby is six months old	52	48
Husband and family support	96	4
Work outside the home more than six hours	25	75
Pumping or expressing breast milk	27	73

Table 4. The Correlation between Knowledge and Behavior Breastfeeding Mothers in Lactational Amenorrhea Method as a Natural Contraceptive

Variable	Category				OR	95% CI	p-value
	Good		Not Good				
	n	%	n	%			
Knowledge	53	59.6	43	51.7	3.463	1.411–8.498	0.006
Behavior	36	40.4	46	48.3			

Notes: OR = Odds Ratio; CI = Confidence Interval; p-value<0.05

milk bottle, and 98% breastfeed more than eight times/day. In addition, 52% reportedly have their menstruation again at six months postpartum, and 96% received support from husbands and family during this phase and while applying LAM. Meanwhile, 25% of the respondents work outside for more than six hours daily, which indicated the mothers were not with the babies for that period.

The behavior of mothers pumping or expressing breast milk to be later fed to babies through a pacifier or milk bottle was 27% (Table 3). This behavior means that the respondents did not directly breastfeed, which affects the use of LAM. Besides, there is no stimulation of the baby's mouth suction over the mother's nipple, which is expected to stimulate hormone performance. However, this maternal behavior is not appropriate to the success and effectiveness of using LAM as a contraceptive. This behavior indicated poor knowledge or uncertainty, as the respondents chose to use additional contraceptives.

Table 4 shows mothers with good knowledge (59.6%) about breastfeeding as a natural contraceptive method known as LAM. However, despite the incorrect application, the respondent's behavior towards the application was not good (48.3%), indicating substantial knowledge about this technique as a natural contraceptive method. This attitude is associated with the mothers feeling of uncertainty about using breastfeeding only for contraception. Based on the results of the statistical tests,

the p-value obtained was 0.006 (OR = 3.463; 95% CI = 1.411-8.498), indicating the existence of a relationship between breastfeeding knowledge and the adoption as behavior aimed at natural contraception.

Discussion

This study was conducted to determine the relationship between knowledge and breastfeeding behavior towards adopting of the Lactational Amenorrhea Method (LAM) as a natural contraceptive. This technique involves the exploitation of biological hormones released in mothers during exclusive breastfeeding babies.³⁰ In addition, the breast milk supply is not affected, thus assuring support for the practice of exclusive breastfeeding.³¹ Based on the study results, a relationship was established between knowledge and respondent behavior towards LAM. Table 4 shows the mother's knowledge as good despite the behavior not being good. Moreover, breastfeeding is known to be highly beneficial for both mother and baby.

Most mothers acknowledge breast milk as the best food for babies. This outcome is similar to study conducted by several experts, where breast milk was preferred as the primary source of nutrition.³²⁻³⁴ In addition, Table 2 shows that the mothers to be informed of the various nutritional components, important and needed to protect newborns from various diseases. Breast milk also tends to increase the baby's immune system against various in-

fections, therefore, reducing the probability of sickness. Breast milk contains fat, carbohydrates, protein, vitamins, and minerals.³⁵ This study showed the participant's knowledge about exclusive breastfeeding from birth to six months, including any drugs or vitamins. Also, all mothers were aware of the capacity for this practice to prevent breast cancer. The study conducted by Franca-Botelho and Anstey highlighted the lower risk of breast cancer in mothers engaged in breastfeeding.^{36,37}

The propensity to suppress ovulation was also discussed,³⁰ as breastfeeding delays the return of fertility due to the release of a gonadotropin-releasing hormone (GnRH) and luteinizing hormone (LH) from the hypothalamus and pituitary, respectively. Furthermore, the plasma concentrations of follicle-stimulating hormone (FSH) are sufficient to induce follicular growth. This development, alongside estradiol secretion, increases to normal while the baby sucks the mother's nipples. Therefore, the suction process prevents the formation of normal preovulation LH waves, and the follicle fails to rupture, thereby delaying conception.³⁸

Similar to the statement of Ciampo LAD & Ciampo IRLD, exclusive breastfeeding induces a period of infertility. This infertility occurs due to the delay of ovarian activity, resulting from high prolactin levels and the release of GnRH.³⁹ The baby sucks the mother's nipples. This stimulates the sensory nerves in the hypothalamus to release prolactin, as well as the anterior pituitary to secrete prolactin hormones required for delayed ovulation.⁴⁰

The advantages of using LAM include economic benefit, absence of any side effects, and the use of drugs or devices is not needed.⁴¹ In addition, the results showed the mother's knowledge about the benefits of LAM as good, although some assume this technique is ineffective. This supposition is the main reason mothers tend to disuade from LAM contraception. Based on the study results, the respondent's behavior was not good because 31% eventually using milk bottles. Hence, the three LAM criteria were not fulfilled, which leads to the onset of menstruation within the first six months postpartum.

The return of fertility in exclusively breastfeeding mothers occurs at about 15 weeks, while others wean or pump the breast milk, leading to increased fertility after five weeks postpartum.⁴² Moreover, this inappropriate application through pumping or expressing has been implicated in the reduced effectiveness of LAM. The results were similar to Labook's study, where expressing breast milk more than once impacted LAM effectiveness. Hence, mothers are prompted to adopt additional contraceptive methods.¹⁷ In addition, there is no problem with FSH and LH eggs maturation while pumping or milking. This phenomenon is attributed to the absence of nipple suction, which is expected to signal the mother's brain to

inhibit hormone activities. Hence, direct breastfeeding is advised. Moreover, support from husbands and families is needed to facilitate the LAM's correct application.

The mothers are also expected to prepare for the transition period from LAM to other contraceptive methods, as additional contraception is needed after the baby is six months old. This plays a crucial role in pregnancy prevention. Furthermore, several factors estimated to inhibit this process have been considered in IEC. These include counseling about the risk of pregnancy during lactational amenorrhea and the importance of using additional contraception, as well as additional information on the risk of pregnancy after LAM.⁴³ This study only discussed the correlation between knowledge and behavior in LAM as a natural contraceptive method without assessing the mother's knowledge and behavior towards the quantitative implementation. However, in-depth information on the application technique while assessing the individual's perceptions, attitudes, and practices was not investigated.

Conclusion

Based on the results and discussion, a correlation was established between maternal knowledge and behavior in applying of LAM as a natural contraceptive method. The mothers were significantly informed about LAM, despite the poor implementation. Despite this outcome, it is supposedly important to balance good knowledge with good behavior. In addition, the participants are not confident about using LAM alone, and additional contraception is predominantly exploited as an option within the first six months postpartum. This attitude potentially affects the use of LAM, and an in-depth understanding of the application is needed for mothers to actually experience the effects.

Abbreviations

LAM: Lactational Amenorrhea Method; IUD: Intrauterine Device; GnRH: Gonadotropin-Releasing Hormone; LH: Luteinizing Hormone; FSH: Follicle-Stimulating Hormone.

Ethics Approval and Consent to Participate

The ethical approval was obtained from the Ethical Commission, Universitas 'Aisyiyah Yogyakarta (Number: 05/KEP-UNISA/VII/2017). The research permit was obtained from the administrative leaders from Moyudan Sub-District, Sleman District, Yogyakarta Province. Before the interview, the interviewers received signed information from the respondents consenting to a willingness to participate in the study.

Competing Interest

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance.

Availability of Data and Materials

This data is available at the Faculty of Health Sciences, Universitas 'Aisyiyah Yogyakarta. However, after a reasonable request, these are available from the authors with permission of the Faculty of Health Sciences, Universitas 'Aisyiyah Yogyakarta.

Authors' Contribution

M and RBJ wrote the first draft of the manuscript and compiled the journal publication. M was also involved in determining the design study, data management, and data analysis. RBJ was involved in data collection and management of data. RBJ was in charge of sending manuscripts to reviewers. RBJ and SRN studied the literature and updated the literature. SRN was in charge of research instruments and validation. All authors contributed to reviewing the manuscript, script revision, read, and approved the final manuscript.

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