

Intention and actual exclusive breastfeeding practices among women admitted for elective cesarean delivery in Kelantan, Malaysia: A prospective cohort study

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ABSTRACT

Introduction: The intention of a woman to breastfeed is one of the predictors of breastfeeding initiation and duration. **Objective:** The aim of this study is to determine exclusive breastfeeding (EBF) intention among women admitted for elective cesarean delivery in Kelantan and their postnatal EBF practices.

Methods: A total of 171 women, mostly Malays, admitted for elective cesarean delivery at two tertiary hospitals in Kelantan participated in this prospective cohort study. The Malay version of Infant Feeding Intentions (IFI) scale was administered one day before the surgery to determine the EBF intention, and follow-up phone calls were made at one month, three months, and six months after delivery to determine the actual EBF practices.

Results: Before delivery, 86.5%, 82.5% and 77.2% of the women somewhat agreed or very much agreed to practice EBF for 1, 3 and 6 months respectively and the actual EBF practices after delivery were 80.1%, 59.6%, and 42.1%. Women who had the intention to practice EBF for 6 months were about 2 times more likely to practice EBF for 6 months than those who did not have the intention to EBF (OR 2.19, 95% CI: 1.01-4.76). No significant association was found between EBF intention and the actual EBF practices at 1 month and 3 months postnatal.

Conclusions: The number of women who practiced EBF after cesarean delivery was lower than those who had the intention prior to delivery. The number further declined as the child grew older. Prenatal EBF intention was associated with actual postnatal EBF practices at 6 months.

KEY WORDS:

Intention, infant, cesarean section, exclusive breastfeeding

INTRODUCTION

Exclusive breastfeeding (EBF) for the first 6 months of life meets the energy and nutrient needs of the vast majority of infants if the breastfeeding technique is done satisfactorily.¹

No other food or fluids are required.² Several studies have shown that healthy infants do not need additional water during the first six months if they are exclusively breastfed, even in hot climates.² Therefore, WHO and UNICEF recommend exclusive breastfeeding starting within one hour after birth until the baby is six months old.³

In 2015, UNICEF has reported that the global EBF rate was 43% which shows an increment compared to 38% in 2007.^{4,5} However, the global target implies that the global rate of exclusive breastfeeding should increase to 50% by 2025.⁶ In Malaysia, the National Health and Morbidity Survey in 2016 reported that the overall prevalence of exclusive breastfeeding among infants under six months old was 47.1%, which is an increment of 32.6% within a ten years duration from 14.5% in 2006.^{7,8}

Prenatal breastfeeding intention is a very important predictor of postnatal breastfeeding initiation.⁹ In addition to that, the intention of the woman to breastfeed is also positively associated with a longer duration of breastfeeding.^{9,10} On the other hand, a woman with no intention to breastfeed or only intend to breastfeed for a short time is more likely not to initiate postnatal breastfeeding or stop breastfeeding early.¹¹

Several studies have found that breastfeeding outcomes are often worse after cesarean delivery compared to vaginal delivery.^{12,13} A study among Italian women found that emergency and elective cesarean deliveries are also similarly associated with a decreased rate of exclusive breastfeeding compared to vaginal delivery. They found that only 3.5% post-cesarean delivery women practiced breastfeeding compared to 71.5% of women with vaginal delivery who breastfed their infants in the delivery room.¹³ Various reports cited the reasons for difficulty in breastfeeding after cesarean delivery included stress that comes from the flabby flesh of the maternal belly, the newborn suddenly getting ill, interrupted sleep, inadequate breast milk, uneasiness due to breast engorgement, and most importantly pain at the surgical site that limits the movement of the woman which causes discomfort leading to the delay of the first mother-child contact.^{14,15}

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Globally, the rates of cesarean sections show an increasing trend from an average of 6.7% in 1990 to 19.1% in 2014.¹⁶ In Malaysia, cesarean sections performed in public hospitals have also increased from 10.5% in 2000 to 25.7% in 2015.^{17,18} The increasing rate of cesarean sections in Malaysia would indeed affect the health of thousands of women and infants since this procedure may delay the initiation and continuation of EBF, and thus hinder both women and children from receiving the multiple benefits gained from breastfeeding. Therefore, this study was conducted to determine intention of EBF among women admitted for elective cesarean delivery in Kelantan, Malaysia and their postnatal EBF practices.

METHODS

Study Design and Population

This prospective cohort study was conducted between January 2017 and January 2018. Women admitted for elective cesarean delivery at the two tertiary government hospitals in Kelantan, Malaysia were included. Women with history of emergency cesarean section, women who had given birth to babies with congenital anomaly, and those who were diagnosed with psychiatric disorders were excluded. Women with a history of emergency cesarean section were excluded since the questionnaire on Infant Feeding Intentions (IFI) scale needs to be administered one day before the surgery. Women who had given birth to babies with congenital anomaly were excluded since they might be admitted to the hospital for long duration and this may interfere with the EBF practice.

The sample size was calculated using the single proportion formula with a 95% confidence interval (CI). The expected proportion of women who had the intention to exclusively breastfeed their babies until three months old was estimated at 45.2% as reported by Nommsen-Rivers and Dewey¹⁹ among women in California. Sample sizes were calculated for various levels of precision and a sample size of 148 was chosen with a precision of 0.08 while taking into consideration available resources. Anticipating a 30% loss during follow-up, a sample size of 196 was decided for this study.

Research Tools

A questionnaire was used to collect the variables of interest. The questionnaire had two parts. The first part was used to obtain information from the women before the cesarean delivery, and the second part was used to obtain information via follow-up calls at 1, 3 and 6 months after cesarean delivery. The first part was questions on sociodemographic characteristics of the women such as age, race, education level, employment status, and monthly household income. The first part also contained questions adapted from the Infant Feeding Intentions (IFI) scale to measure the intention of the women in feeding her newborn.

The IFI scale was developed in English by Nommsen-Rivers and Dewey.¹⁹ The scale consists of five items. The first two items measure the strength of the intention to initiate breastfeeding. While the other three items assess the strength

of intention to provide the infant with human milk as the sole source of milk at one, three, and six months of age. The responses were scored on a 5-point scale that ranges from 0 to 4 (0=very much disagree, 1=somewhat disagree, 2=unsure, 3=somewhat agree, and 4=very much agree). The first item is negatively worded, hence the responses for item 1 were coded in reverse. The IFI score is calculated by averaging the sum of item 1 and item 2, and adding this average with the sum of item 3, item 4, and item 5. The IFI score may range from 0 to 16, with 0 indicating no intention to breastfeed and 16 indicating a very strong intention to breastfeed for 6 months.¹⁹

The IFI scale was translated and adapted into the Malay language following the guidelines proposed by Beaton et al.²⁰ with a few modifications in consideration of available resources. The procedures include forward translation of the original IFI scale into Malay language by two independent translators who were fluent in both English and Malay, reconciliation of the translations into one Malay version by a bilingual expert panel, translation of the Malay version back into English by another two independent translators, and consolidation of the translations by the similar expert panel to achieve equivalences between the translated and the original versions of the IFI scale. The expert panel comprised of two lactation consultants, one family medicine specialist, and two experts in research methodology, also verified the content validity of the Malay version of the IFI scale. A pilot study was conducted among 30 conveniently selected mothers admitted for elective cesarean delivery at one of the hospitals. The internal consistency reliability of the Malay version of the IFI-scale was found to be good with a Cronbach's alpha of 0.791.

The second part of the questionnaire was on a feeding practice checklist taken from a previously validated questionnaire developed in the Malay language by Muda et al.²¹ The checklist contains 4 questions to ask the women during the follow-up telephone calls at one, three and six months if they feed their babies with the following: 1) breastmilk, 2) plain water, 3) formula milk, and 4) complimentary food. The frequency of each practice was also assessed. Three response options were given: "never", "not everyday", and "everyday".²¹ In addition, there is an open-ended question that asks about the main reason for not practicing EBF.

Data Collection

Data was collected in 2 phases. Phase 1 involved obtaining information on sociodemographic characteristics and the infant feeding intention from the women in the ward, one day before the elective cesarean delivery. Purposive sampling method was applied in this study. The researcher approached the women who were admitted to the antenatal ward for elective caesarean delivery one day prior to the surgery. The inclusion and exclusion criteria of the participant were verified first before approaching potential respondent. All potential respondents were informed of the importance, objectives, procedures, and other essential information about this study. Written informed consent was obtained from those who agreed to participate. Further instructions about the

Table I: Socio-demographic characteristics of the respondents (n=171)

Variable	Frequency (%)
Age group (years)	
20-30	62 (36.3)
31-40	101 (59.0)
>40	8 (4.7)
Race	
Malay	169 (98.8)
Others	2 (1.2)
Highest education level	
No formal education/Primary education	5 (2.9)
Secondary education	83 (48.5)
Post-secondary/Diploma	22 (12.9)
Tertiary educational	61 (35.7)
Employment status	
Employed	99 (57.9)
Unemployed	72 (42.1)

Table II: IFI scale item response (n= 171)

Item	Very much agree	Some what agree	Unsure	Some what disagree	Very much disagree
I am planning to only formula feed my baby (I will not breastfeed at all)	4 (2.4)	5 (2.9)	6 (3.5)	40 (23.4)	116 (67.8)
I am planning to at least give breastfeeding a try	84 (49.1)	65 (38.0)	1 (0.6)	6 (3.5)	15 (8.8)
When my baby is 1 month old, I will be breastfeeding without using any formula or other milk	93 (54.4)	55 (32.1)	7 (4.2)	4 (2.3)	12 (7.0)
When my baby is 3 months old, I will be breastfeeding without using any formula or other milk	90 (52.6)	51 (29.9)	12 (7.0)	6 (3.5)	12 (7.0)
When my baby is 6 months old, I will be breastfeeding without using any formula or other milk	78 (45.6)	54 (31.6)	21(12.3)	6 (3.5)	12 (7.0)

Table III: Other feeding practices at 1, 3 and 6 months postnatal (n=171)

Frequency (%)	Frequency (%)		
	Never	Not everyday	Everyday
Plain water			
1 month	163 (95.3)	7 (4.1)	1 (0.6)
3 months	154 (90.1)	14 (8.1)	3 (1.8)
6 months	105 (61.4)	26 (15.2)	40 (23.4)
Formula milk			
1 month	142 (83.0)	12 (7.0)	17 (9.9)
3 months	110 (64.3)	22 (12.9)	39 (22.8)
6 months	91 (53.2)	18 (10.5)	62 (36.3)
Complementary food			
1 month	171 (100.0)	0 (0.0)	0 (0.0)
3 months	171 (100.0)	0 (0.0)	0 (0.0)
Before reached 6 months	124 (72.5)	10 (5.9)	37 (21.6)

Table IV: Association between intention to practice EBF and actual EBF practice at 1, 3, 6 months postnatal using simple logistic regression analysis

Variable	Crude OR	95% CI	Wald statistics (df)	P value
Intention to practice EBF for 1 month and actual EBF practice at 1 month				
Not having intention	1.00			
Having intention	1.51	0.55, 4.18	0.635	0.425
Intention to practice EBF for 3 months and actual EBF practice at 3 months				
Not having intention	1.00			
Having intention	1.16	0.73, 3.36	1.39	0.238
Intention to practice EBF for 6 month and actual EBF practice at 6 month				
Not having intention	1.00			
Having intention	2.19	1.01, 4.76	3.898	0.048

study were provided, and the respondents were asked to complete the first part of the questionnaire. The questionnaire was self-administered, and completed questionnaires were collected immediately. For phase 2 of the data collection, information pertaining to feeding practices of the respondents with their infant were obtained via follow-up calls at one, three and six months after their cesarean delivery. The questions asked to the respondents were guided by a feeding practice checklist.

Statistical Analysis

Data entry and analysis was done using IBM SPSS Statistics for Windows, Version 24.0 (SPSS V.24). Data checking and cleaning were done prior to data analysis. Descriptive statistics were used to describe the sociodemographic characteristics of the respondents, IFI scale item response, and feeding practices after the elective cesarean delivery. Numerical data were presented as a mean and standard deviation (SD), and categorical data were presented as frequency and percentage.

Association between intention to practice EBF at 1, 3, and 6 months of age and the respective actual EBF practice was analysed using simple logistic regression analysis. The significance level was set at 0.05. For the purpose of this analysis, women who very much agreed and somewhat agreed based on the IFI scale to provide their infant with breast milk as the sole source of milk at one, three and six months of age were considered as having the intention to practice EBF until the stated duration, while those who were unsure, somewhat disagreed and very much disagreed to exclusively breastfeed their babies were considered as having no intention to practice EBF.

Ethical Approval

The ethical approval for this study was obtained from the Human Research Ethics Committee of Universiti Sains Malaysia [USM/JEPeM/16050192] and the Ministry of Health (MOH) Malaysia Medical Research and Ethics Committee [NMRR-16-2347-32612 (IIR)].

RESULTS

196 women participated in Phase 1 of the study. However, only 171 women were contactable during the follow-up phone calls at one month, three months and six months postpartum and completed the study, giving a 87.2% response rate. Sociodemographic characteristics of the respondents are shown in Table I. Their ages ranged from 20 to 44 years old with a mean age of 32.3 years (SD=4.83). The majority (98.8%) of the respondents were Malay, while the rest of the respondents were Chinese. Approximately half of the respondents had received either post-secondary or tertiary education (48.6%). Slightly more than half of the respondents were employed and the median of monthly household income was RM 2500 (IQR 3500).

The mean IFI score is 12.8 (SD 3.70). Table II shows the IFI scale item response. Most respondents somewhat agreed or very much agreed to at least try breastfeeding (87.1%), and

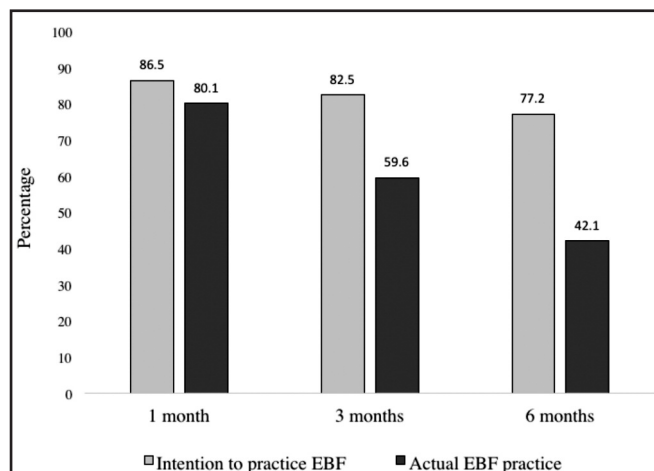


Fig. 1: Intention to practice EBF and actual EBF practices at 1, 3, 6 months postnatal.

only a small number (5.3%) of somewhat agreed or very much agreed to feed only formula milk to their baby. Additionally, respondents who answered somewhat agreed or very much agreed to practice EBF for one, three and six months were 86.5%, 82.5%, and 77.2% respectively. A reduction in the percentage of respondents with the intention to practice EBF as the child grows from one to six months was apparent.

Figure 1 shows the comparison between the percentage of respondents who had the intention to practice EBF and the actual EBF practices at one, three and six months. The percentage of respondents who exclusively breastfed their babies at one, three and six months, are 80.1%, 59.6% and 42.1% respectively. The values are lower compared to the percentage of those who had the intention to practice EBF obtained in Phase 1 of the study. At all months (periods of breastfeeding), the main reason for not practising EBF given by most respondents was insufficient breast milk.

Table III shows other feeding practices at one, three and six months postnatal. The percentages of respondents who gave water to their babies at one, three and six months old were 4.7%, 9.9% ,and 38.6%, respectively. The percentage increased as the infant grows older. The same pattern was observed in feeding infants with formula milk. Some infants received complimentary food (27.5%) even before they reached six months old.

The results of a simple logistic regression analysis of the association between intention to practice EBF and actual EBF practices at one, three and six months postnatal is shown in Table IV. No significant association was found between prenatal EBF intention and postnatal EBF practices at one month and three months. However, a significant association was found between EBF intention and practice at six-month postnatal; women who had prenatal intention to practice EBF for six months were two times more likely to exclusively breastfeed their infants for six months than those who had no intention to practice EBF (OR 2.19, 95% CI: 1.01- 4.76).

DISCUSSION

There is substantial rise in the global rate of cesarean section over the last few decades despite the short-term and long-term risks associated with the surgical procedures.¹⁶ Considering the upward trend in cesarean delivery and the evidence that women who deliver by planned cesarean section had no intention to breastfeed, did not initiate breastfeeding and discontinue breastfeeding early than those who had a vaginal delivery,²² this study was conducted.

Before cesarean delivery, most women had the intention to give breastfeed a try. The percentages of women who intended to practice EBF until one, three and six months were 86.5%, 82.5%, and 77.2% respectively with a mean IFI score of 12.8 (SD 3.70). Our percentages are higher compared to those reported in a study among a sample of pregnant women attending the University of California Davis Medical Center prenatal clinics at 60.6%, 45.2%, and 32.9% until one, three and six months respectively with a mean IFI score of 11.8 (SD 3.9).¹⁹ Additionally, the percentage of women in our study who did not consider breastfeeding at all was lower at 5.3% compared to that reported among the women in California at 11.2%.¹⁹ In South Tangerang, Indonesia, the percentage of pregnant women who intended to provide EBF to their babies until they reach 6 months old was relatively high at 73.8%, the EBF intention at one month-old and two month-old were much lower, at 6.7% and 19.5% respectively.²³

Favourable findings in this study may be due to the fact that both tertiary hospitals in this study are accredited Baby-Friendly Hospital Initiative (BFHI). The BFHI was launched in 1991, as an effort by UNICEF and World Health Organization to ensure successful breastfeeding at facilities providing maternity and newborn services by implementing 10 specific steps to protect, promote and support breastfeeding.²⁴ One of the steps is to inform all pregnant women about the benefits and management of breastfeeding. The efforts may have contributed to the high rate of intention to practice EBF, as described in a previous study by Nguyen et al.²⁵ The positive impact of the BFHI on mothers' intention for EBF was also evident in a study among Korean pregnant women that reported mothers who planned to give birth at Baby-Friendly hospitals were more likely to participate in antenatal breastfeeding education program and have the intention for EBF.²⁶ Additionally, mothers who delivered their babies at Baby-Friendly hospitals were more likely to initiate breastfeeding and were breastfed longer than babies born at hospitals that have never implemented the BFHI.^{26,27}

EBF rates vary across studies because of the differences in sociodemographic characteristics of mothers as well as other maternal and child-related factors including delivery methods, postpartum complications, social support, and perceived efficacy.^{9,10} The rate of EBF at one, three and six months among women who had undergone elective cesarean delivery in this study was 80.1%, 59.6%, and 42.1% respectively. The rates of EBF at one and three months among women in this study are higher than those reported in the latest National Health Morbidity Survey (NHMS) in Malaysia with 59.5% and 52.7% of post cesarean delivery women practiced EBF at 0-2 and 0-4 months respectively. However,

the rate of EBF among infants under six months of age was higher compared to our finding at 52.8%.⁸ In Italy, of 398 women who delivered by elective cesarean section, 74.5%, 55.1%, and 46.6% provided EBF for their babies for seven days, three months and six months respectively.¹³ A six-month cohort study in Hunan, China reported comparable findings – the EBF rates at one, three and six months were 71.3%, 60.0%, and 20.0% respectively for women who had a cesarean delivery, and 86.2%, 72.5%, and 22.4% for women who had a vaginal delivery.²⁸ In all the above studies, the EBF prevalence appears to decrease as the babies grow older.

The results of our study clearly highlighted the discrepancy between EBF intention and the actual EBF practices, and the gap became wider as the months passed. The substantial gap between EBF intention and EBF duration has been reported in other studies. In the United States, data from a large longitudinal study showed that most women who intended to exclusively breastfeed did not meet their intended duration. In particular, while 85% of women intended to provide EBF for at least 3 months, only 45.3% exclusively breastfed their babies for at least three months, and while 57.8% intended to exclusively breastfeed for at least five months, only 24.9% exclusively breastfed for the intended duration.²⁹ A study in Canada also showed a lower EBF rates at six months after birth (14.4%) than desirable despite most women having high rates of breastfeeding intention (90.0%) and initiation (90.3%).³⁰

Breast milk contains 88.1% of water and the water content of breastmilk that is consumed by an exclusively breastfed baby meets the water requirements for infants and therefore no additional water is needed even in hottest, driest climates.² In this study, few mothers gave water to their babies at 1 month old. Regardless of reasons, indiscriminate provision of water to babies under the age of six months should be discouraged as there are possible negative effects on the duration of breastfeeding from the brief use of additional water or glucose water.³¹ Besides water and liquid, early introduction of complementary food should also be discouraged as there is no evidence of benefit from additional foods for infants between four to six months old.³¹ In this study, more than a quarter of women had already given complementary food to their babies before they reached six months old possibly due to the belief that solid foods could make babies more satisfied, healthier, and have better nutrition.

Inadequate milk supply was the most common reason given by the women in this study for introducing formula milk to their babies, given either alone or in combination with breast milk and/or water. Insufficient milk supply was also the most common problem with breastfeeding and the primary reason for EBF cessation reported in another prospective cohort study among pregnant women in Kelantan,³² as well as in studies from other countries including Ireland, Vietnam, and Taiwan.^{10,25,33} Perception of having insufficient milk was the most commonly cited reason for early breastfeeding discontinuation or decreased exclusivity. Normally, a mother would wait for the satisfaction cues from the infant as the main indication of ample milk supply. The actual adequacy of the milk supply was never objectively evaluated.³⁴ Thus, interventions should include strategies to increase maternal

confidence in breastfeeding as breastfeeding self-efficacy levels of mothers increased, they perceived their milk to be more sufficient.³⁵ Furthermore, improvement of maternal education to ensure adequate supply, assessment of milk supply, and effective assessment of infant cues is important to find a root cause of perception on insufficient milk supply.³⁴

Prenatal breastfeeding intention is a strong predictor of postnatal breastfeeding initiation.¹⁰ Studies have shown that women who have the intention to breastfeed were more likely to initiate and to continue breastfeeding.^{9,10} Result of our study showed that women who somewhat agreed or very much agreed to practice EBF for six months before delivery was two times more likely to exclusively breastfeed their infants for six months than those who were unsure, somewhat disagreed or very much disagreed to practice EBF. This finding was in agreement with the results of a study conducted among 78 mothers from the United States that reported a strong and positive correlation between breastfeeding intention and actual EBF at six months duration.³⁶ A study in Taiwan found that intention of mothers to practice EBF before delivery was the most important factor that enhanced and prolonged breastfeeding practices by increasing the odds of breastfeeding in the postpartum periods from 3.0 during hospital stay, to 6.1 at one month postpartum, 13.9 at four months postpartum and 16.8 at six months postpartum.³⁷ No association was found between breastfeeding intention at one and three months and the respective actual breastfeeding practices. When the intention of women to practice EBF for a longer duration, i.e. six months, the actual EBF practice tends to be longer as well. The extent of EBF practice is highly dependent on the duration of the women's intention to practice EBF as study found mother's intention to breastfeed was the most important factor to lengthen breastfeeding practices over time.³⁷

The findings of our study provided important insights on the intention and actual EBF practices among women admitted for elective cesarean delivery in Kelantan, Malaysia, and add to the growing body of evidence supporting the association between prenatal breastfeeding intention and postnatal breastfeeding initiation and continuation practice. Furthermore, the findings of this study may serve as a basis for development of promotion programs that focus on pregnant women indicated or planned for elective cesarean delivery. Nevertheless, the reliability of self-reported measures on postpartum infant feeding practices depends on the respondents' motivation and honesty. Thus, our results should be interpreted with caution as there is a possibility that the mothers may be biased toward providing more favourable responses.

CONCLUSION

The strength of breastfeeding intention among pregnant women admitted for elective cesarean delivery at two tertiary hospitals in Kelantan was relatively high. Most women had planned to provide their infant with human milk as the sole source of milk at one, three and six months of age. However, there was a substantial gap between EBF intention and actual

EBF practice as the percentages of women who actually exclusively breastfed their infants at one, three and six months was lower than the percentage who had the intention to provide EBF prior to delivery. The percentage of not practicing EBF increased as the child grew older. Prenatal EBF intention at six months was associated with actual postnatal EBF practices at six months.

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