



■ Original Article

Factors Associated with Early Breastfeeding Initiation among Women Who Underwent Cesarean Delivery at Tertiary Hospitals in Kelantan, Malaysia

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Background: Cesarean delivery is linked with lower rates of early breastfeeding initiation. This study aimed to determine the prevalence and associated factors of early initiation of breastfeeding among women admitted for elective cesarean delivery in Kelantan, Malaysia.

Methods: A total of 171 women admitted for elective cesarean delivery at two tertiary hospitals in Kelantan, Malaysia, participated in this study. On day two after cesarean delivery, face-to-face interviews were conducted with the mothers to get information on feeding practice. Descriptive statistics, including simple and multiple logistic regressions, were used for data analysis.

Results: Seventy-three percent of mothers initiated breastfeeding within 1 hour of birth. Approximately 15.8% and 10.5% of mothers initiated breastfeeding within 24 hours and ≥ 24 hours, respectively. Skin-to-skin contact between mothers and their infants occurred in 77.8% of cases after cesarean delivery. Breastfeeding initiation was significantly associated with skin-to-skin contact (odds ratio [OR], 14.42; 95% confidence interval [CI], 3.58–58.06), mothers who exclusively breastfed during hospitalization (OR, 36.37; 95% CI, 5.60–236.24), and infants who were not sleepy during attempts at breastfeeding (OR, 5.17; 95% CI, 1.32–20.21).

Conclusion: Based on our results, it is possible to increase the proportion of mothers initiating breastfeeding within 1 hour among women who undergo elective cesarean delivery. Therefore, it is important that health practitioners educate women beginning in the antenatal period who plan to undergo cesarean delivery by emphasizing the importance of early initiation of breastfeeding.

Keywords: Early Initiation; Breastfeeding; Cesarean Delivery; Skin-to-Skin Contact

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INTRODUCTION

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend initiation of breastfeeding within the first hour of birth, referred to as "early initiation of breastfeeding." Early initiation of breastfeeding is critical to newborn survival and to establish breastfeeding practice over the long term. When breastfeeding is delayed after birth, the consequences can be life-threatening and the longer newborns are left waiting, the greater the risk.¹⁾ However, the WHO reported that about 78 million babies, or three in five, are not breastfed within the first hour of life, putting them at higher risk of death or disease and making them less likely to continue breastfeeding.²⁾ A recent systematic review and meta-analysis of evidence regarding breastfeeding initiation time and infant outcomes showed that infants who initiated breastfeeding within two to 23 hours of birth had a 33% greater risk of neonatal mortality compared to infants who initiated breastfeeding within 1 hour of birth, and infants who initiated breastfeeding 24 hours or more after birth had approximately two-fold greater risk of neonatal mortality.³⁾

Studies have found that early initiation of breastfeeding is an extremely important factor associated with the maintenance of long-term breastfeeding practice. Women who initiated breastfeeding more than 1 hour after delivery, and those with greater breastfeeding difficulties, were more likely to discontinue exclusive breastfeeding.⁴⁾ The WHO and UNICEF guidelines on Baby-Friendly Hospital Initiative (BFHI) 2009 proposed a step 4, which is to "help mothers to initiate breastfeeding within a half-hour of birth" for successful breastfeeding. The BFHI, launched by UNICEF and WHO in 1991–1992, has grown, encompassing more than 20,000 hospitals in 156 countries around the world over the last 15 years.⁵⁾ This study was conducted at two tertiary hospitals in Kelantan, Malaysia, both of which received the Baby Friendly Hospital Award of the BFHI and adhere to each of the 10 steps of the BFHI global criteria provided by WHO and UNICEF in 2009 for successful breastfeeding.⁵⁾ The BFHI Award is awarded every 3 years. The process to maintain BFHI status involves external assessment and use of a self-appraisal tool to assess the policies and practices that are provided by UNICEF on BFHI, Section four Hospital Self-Appraisal and Monitoring, 2009.⁶⁾

Delivery methods may affect breastfeeding initiation and duration.⁷⁾ Multiple studies have found cesarean delivery may hinder breastfeeding initiation.^{8,9)} A systematic review of breastfeeding after cesarean delivery found that the rates of early breastfeeding (any attempt to initiate breastfeeding during hospital discharge) were lower after cesarean delivery compared with vaginal delivery.¹⁰⁾ A similar finding was reported in a study done among Puerto Rican women after childbirth, which found that cesarean delivery was negatively related to breastfeeding initiation.¹¹⁾

Breastfeeding initiation becomes a problem after cesarean delivery due to the fact that the surgery is associated with inherent risks and difficulties that can prevent this initiation.⁸⁾ More specifically, the cesarean section surgical procedure has a longer recovery period than

vaginal birth and can cause serious complications, including pain, uterine haemorrhage, infections, and loss of mobility in women.^{12,13)} These inherent difficulties and potential complications that can compromise a woman's ability to breastfeed, due to infant-mother separation, as well as forcing mothers to concentrate more on their recovery than on their baby's nutritional needs.^{9,12,13)}

The main breastfeeding challenges after cesarean delivery include maternal exhaustion, perceived lack of infant interest, infant latching difficulty, and perceived lack of infant satiation.¹⁴⁾ Additionally, cesarean delivery also generates stress resulting from the flabby flesh of maternal belly, sudden illness of the baby, interrupted sleep, inadequate amount of breast milk, and uneasiness due to breast engorgement.¹⁵⁾ After cesarean delivery, mothers also experienced nausea and extreme drowsiness, which made it difficult for them to breastfeed. Additionally, there was lack of initial skin-to-skin contact (SSC) between mother and baby, and some babies were too sleepy to breastfeed leading to increased frustration of the mother and hindering initiation of breastfeeding.¹⁶⁾

Therefore, this study was conducted to determine the prevalence and associated factors of early initiation of breastfeeding among mothers admitted for elective cesarean delivery in Kelantan, Malaysia. By studying the factors associated with initiation of breastfeeding after cesarean delivery, healthcare personnel that are directly involved with women during the postpartum period can provide more optimal health education and assistance. The results of this study can also be used to educate healthcare providers that are directly involved in breastfeeding counseling so that they may provide mothers with the most accurate information. Hopefully, the findings of this study will increase the breastfeeding rate among mothers who delivered via cesarean section by providing information to overcome potential obstacles that may hinder initiation and maintenance of breastfeeding practice.

METHODS

1. Study Design and Respondents

A prospective cohort study was conducted among women who were electively admitted for cesarean delivery at two tertiary hospitals in Kelantan, Malaysia. Women who had delivered healthy infants were included in this study, while those who had been diagnosed with psychiatric disorders or had given birth to babies with congenital anomalies were excluded from the study. A purposive sampling method was applied in this study and the sample size was calculated using the single proportion formula with a 95% confidence interval (CI). As reported by Pérez-Ríos et al.,¹¹⁾ the proportion of women in Puerto Rico who had initiated breastfeeding was 61.5%. Based on this information, sample sizes were calculated for various levels of precision, and a sample size of 185 was chosen while taking into consideration the available resources. A sample size of 196 was decided for this study assuming a 10% loss to follow-up.

2. Research Tools

A structured questionnaire was used in this study. The questionnaire consisted of three parts. The first part included questions regarding the demographic characteristics of the respondents (age, race, education level, employment status, and monthly household income), and the second part required information on (1) previous obstetric and breastfeeding history of the respondents, (2) current obstetric history, and (3) cesarean delivery-related information. Information regarding number of living children (parity), previous cesarean delivery experience, age of last child (in years), and feeding method used for the last child, including the following: (1) breast milk only, (2) breast milk and other types of drinks at certain time only, (3) formula milk besides breast milk, and (4) formula milk only. In addition, gestational age in weeks, gravida, length of stay in the hospital, and types of anesthesia used during childbirth were included in the questionnaire.

The third part included questions on (1) time of breastfeeding initiation, (2) infant's responses during breastfeeding initiation, (3) maternal experience toward breastfeeding initiation and practice within 24 hours of cesarean section, and (4) infant's feeding methods during hospitalization. The third part of the questionnaire was developed based on a review of the literature. The pertinent information were defined precisely by the researchers after a series of discussions. The language of the final questionnaire was Malay. Content validity was verified by an expert panel of two lactation consultants and an expert in research methodology. The reliability of the questionnaire was examined by assessing its internal consistency. The questionnaire was found to have good internal consistency based on Cronbach's α of 0.91 for breastfeeding initiation and 0.71 for maternal experience toward breastfeeding initiation and practice within 24 hours of cesarean section as shown in Table 1.

3. Data Collection

Data collection was conducted from January 2017 to January 2018 via assisted administered questionnaire by the researcher and four trained research assistants. The women who participated in this research were briefed by the researcher about this study. Informed consent was obtained when the women fulfilled the inclusion criteria. The questionnaire was filled out by the researcher/research assistant during face-to-face interview 2 days after cesarean delivery. Information on the date of surgery, type of anesthesia used, and infant-related details were obtained from the patient's hospital records. Information on the date of discharge was obtained from the Hospital Information System or the Patient Registration Book.

4. Ethical Approval

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

Table 1. Summary of reliability for breastfeeding experience within the first 24 hours of the postoperative period

	Items	Cronbach's α
Breastfeeding initiation	1. Attaching infant at the breast	0.910
	2. Position the infant during breastfeeding	
Maternal experience toward breastfeeding initiation and practice within 24 hours after cesarean section	3. Feels embarrassed to breastfeed in open area	0.700
	4. Feels easy	
	5. Feels comfortable	
	6. Feels confident that the amount of breast milk is adequate for the baby	
	7. Difficulty moving due to pain	
	8. Feeling tired	
	9. Feeling worried or sad	
	10. Headache or dizziness	
	11. Nausea	
	12. Feeling sleepy	
	13. Pain at the surgical site	
	14. Perception of no milk	
	15. Cracked nipple	
	16. Inverted nipple	
	17. Breast pain during breastfeeding	

5. Statistical Analysis

Data entry and analysis was done using IBM SPSS Statistics ver. 24.0 software (IBM Corp., Armonk, NY, USA). Data checking and cleaning was done before the analysis. Descriptive statistics were used to analyse the following data: socio-demographic data, previous obstetric and breastfeeding history of the respondents, current obstetric history and cesarean delivery information, time of breastfeeding initiation after elective cesarean delivery, infant's responses during breastfeeding initiation, maternal experience toward breastfeeding initiation and practice within 24 hours of cesarean section, and infant's feeding methods during hospitalisation. Simple and multiple logistic regression (MLR) analyses were used to determine the factors associated with breastfeeding initiation among women who delivered via cesarean section in Kelantan, Malaysia. The independent variables included socio-demographic characteristics, previous obstetric and breastfeeding profile, current obstetric profile, current cesarean delivery-related information, breastfeeding experience within the first 24 hours after surgery, and type of feeding method before discharge from the ward. The dependent variable was breastfeeding initiation within 1 hour, or referred as early breastfeeding initiation after cesarean delivery, and categorized as yes or no. Before MLR was performed, the distribution and frequencies were examined. Simple logistic regression was done to screen the variables for further MLR analysis. All variables with P-value less than 0.25 and clinically significant variables were included in the MLR. The P-value was set larger than the level of significance to

allow more important variables to be included in the model. The interaction terms were checked using the likelihood ratio test. Multicollinearity-related issues were identified by the variance inflation factor test. The final model was assessed for fitness using the Hosmer-Lemeshow goodness-of-fit test. The classification table for sensitivity and specificity, as well as the area under the receiver operating characteristic (ROC) curve, were also obtained to evaluate the model fitness. Influential outliers were identified using Cook's distance. Data points above 1.0 were considered influential outliers.

Table 2. Time of breastfeeding initiation and infant's responses during breastfeeding initiation (n=171)

Variable	Frequency (%)
Time of breastfeeding initiation after caesarean delivery	
Within 1 h	126 (73.7)
>1 h to 23 h	27 (15.8)
24 h and more	18 (10.5)
Had skin-to-skin contact	
Yes	133 (77.8)
No	38 (22.2)
Infant's responses during breastfeeding initiation	
Infant willing to feed	
Yes	157 (91.8)
No	7 (4.1)
Not sure	7 (4.1)
Infant looks sleepy	
Yes	50 (29.2)
No	113 (66.1)
Not sure	8 (4.7)
Infant able to attach well to the breast	
Yes	147 (86.0)
No	15 (8.7)
Not sure	9 (5.3)

RESULTS

The mean age of the selected respondents was of 32.3±4.83 years. Approximately half (58.5%) of the respondents had 2 to 4 living children, and more than half of the children were aged between 3 to 5 years (62.2%). Most respondents (78.9%) had previous experience with breastfeeding their child, and almost two-thirds of them (65.9%) had practiced exclusive breastfeeding for 6 months for their last child. Most of the respondents (90.6%) were pregnant at 38 to 42 weeks of gestation. Over two-thirds of the respondents (73.7%) were pregnant for the second to fourth time (multigravida), while 31 respondents (18.1%) had never been pregnant before (primigravida). Most respondents (84.8%) had received spinal anesthesia for their cesarean delivery and the duration of hospital stay for 93.0% was 3 days or less.

Table 2 shows the time of breastfeeding initiation and infants' responses during breastfeeding initiation. About three-quarters of the respondents (73.7%) had initiated breastfeeding within 1 hour of cesarean delivery, while 18 respondents (10.5%) initiated breastfeeding at 24 hours and more. Mean±standard deviation duration of time between childbirth and first breastfeeding initiation was 1.26±0.44 hours. More than three-quarters of the respondents (77.8%) had SSC with their infants immediately after cesarean delivery. During the SSC, there were a few infant responses that were identified by the respondents, such as an increase in salivation and movement toward the nipple, which showed the desire of the infant to feed. Most of the infants (91.8%) were willing to feed and were able to attach well to the breast (86%). Regarding maternal experience during breastfeeding initiation within 24 hours after cesarean section, nearly half of the respondents (49.7%) found it was easy to attach their infant to the breast, and more than half of them (55%) also found it was easy to position their infant for breastfeeding.

Table 3 shows maternal experience toward breastfeeding initiation and practice within 24 hours of cesarean section. Only a minority of

Table 3. Maternal experience toward breastfeeding initiation and practice within 24 hours post-caesarean section (n=171)

Variable	Very often	Often	Sometimes	Seldom	Never
Feels embarrassed to breastfeed in open area	6 (3.5)	29 (17.0)	39 (22.7)	36 (21.1)	61 (35.7)
Feels easy	53 (31.0)	75 (43.9)	26 (15.2)	11 (6.4)	6 (3.5)
Feels comfortable	52 (30.4)	75 (43.8)	28 (16.4)	10 (5.8)	6 (3.5)
Feels confident that breast milk is adequate for baby	63 (36.8)	64 (37.4)	18 (10.5)	16 (9.4)	10 (5.9)
Difficulty to move due to pain	33 (19.3)	51 (29.8)	43 (25.1)	39 (22.9)	5 (2.9)
Feeling tired	14 (8.2)	37 (21.6)	40 (23.4)	32 (18.7)	48 (28.1)
Feeling worry or sad	1 (0.6)	13 (7.6)	24 (14.0)	31 (18.1)	102 (59.7)
Had headache or dizziness	4 (2.3)	12 (7.0)	27 (15.8)	26 (15.2)	102 (59.7)
Had nausea	3 (1.8)	7 (4.1)	10 (5.8)	13 (7.6)	138 (80.7)
Feeling sleepy	9 (5.3)	18 (10.5)	42 (24.6)	47 (27.5)	45 (26.2)
Pain at surgical site	25 (14.6)	41 (24.0)	54 (31.6)	44 (25.7)	7 (4.1)
Perceived no milk	6 (3.5)	18 (10.5)	25 (14.6)	26 (15.2)	96 (56.2)
Had cracked nipple	1 (0.6)	11 (6.4)	19 (11.1)	8 (4.7)	132 (77.2)
Had inverted nipple	5 (2.9)	8 (4.7)	10 (5.8)	7 (4.1)	141 (82.5)
Breast pain as baby suckle	6 (3.5)	12 (7.0)	25 (14.6)	32 (18.7)	96 (56.2)

Values are presented as frequency (%).

Table 4. Factors associated with early breastfeeding initiation by simple logistic regression analysis (n=171)

Variable	Crude odds ratio (95% confidence interval)	χ^2 (degrees of freedom)*	P-value*
Parity (no. of living child)			
Nil	1.00		
Primiparous	3.12 (0.88–11.05)	3.13 (1) [†]	0.077 [†]
Multiparous	0.55 (0.55–2.84)	0.28 (1) [†]	0.594 [†]
Grand multiparous	0.38 (0.38–31.81)	1.24 (1) [†]	0.266 [†]
Gravida			
Primigravida	1.00		
Multigravida	1.70 (0.74–3.93)	1.57 (1) [†]	0.210 [†]
Grand multigravida	5.47 (1.35–22.12)	5.69 (1) [†]	0.017 [†]
Types of anaesthesia			
General	1.00		
Epidural	0.67 (0.107–4.17)	0.19 (1) [†]	0.665 [†]
Spinal	3.83 (0.74–19.96)	2.52 (1) [†]	0.110 [†]
Infant's admission to ward			
Yes	1.00		
No	1.99 (0.99–3.96)	3.84 (1)*	0.055*
Infant willing to feed during initiation of breastfeeding			
Not sure	1.00		
No	2.05 (0.59–106.94)	2.47 (1) [†]	0.116 [†]
Yes	3.90 (0.84–18.18)	3.00 (1) [†]	0.083 [†]
Infant looks sleepy during initiation of breastfeeding			
Yes	1.00		
No	3.58 (1.69–7.56)	14.10 (1) [†]	<0.001 [†]
Not sure	0.43 (0.09–2.02)	0.44 (1) [†]	<0.505 [†]
Infant able to attach well to the breast during initiation of breastfeeding			
Not sure	1.00		
No	0.70 (0.13–3.68)	0.18 (1) [†]	0.674 [†]
Yes	2.76 (0.70–10.88)	2.11 (1) [†]	0.146 [†]
Skin-to-skin contact done after caesarean			
No	1.00		
Yes	5.13 (2.35–11.18)	14.10 (1)*	<0.001*
Women's experience to attach infant to the breast			
Difficult	1.00		
Easy	2.13 (1.03–4.40)	4.13 (1)	0.042
Mothers felt embarrassed to breastfeed in open area			
Too often/often	1.00		
Sometimes/seldom	0.47 (0.18–1.22)	2.38 (1) [†]	0.122 [†]
Never	1.02 (0.36–2.89)	0.02 (1) [†]	0.969 [†]
Mothers feel comfortable to breastfeed			
Never	1.00		
Sometimes/seldom	1.92 (0.34–10.90)	0.55 (1) [†]	0.460 [†]
Too often/often	3.38 (0.65–17.65)	2.08 (1) [†]	0.149 [†]
Mothers felt confident that breast milk was adequate			
Never	1.00		
Sometimes/seldom	1.92 (0.42–8.67)	0.72 (1) [†]	0.396 [†]
Too often/often	2.50 (0.63–9.91)	1.71 (1) [†]	0.191 [†]
Mothers experienced tiredness			
Too often/often	1.00		
Sometimes/seldom	1.04 (0.48–2.26)	0.01 (1) [†]	0.923 [†]
Never	2.68 (0.99–7.25)	3.75 (1) [†]	0.053 [†]
Mothers felt worry or sad			
Too often/often	1.00		
Sometimes/seldom	1.14 (0.33–3.41)	0.04 (1) [†]	0.832 [†]
Never	2.02 (0.61–6.64)	1.34 (1) [†]	0.247 [†]

(Continued on next page)

Table 4. Continued

Variable	Crude odds ratio (95% confidence interval)	χ^2 (degrees of freedom)*	P-value*
Mothers felt headache or dizziness			
Too often/often	1.00		
Sometimes/seldom	0.49 (0.09–2.45)	0.16 (1) [†]	0.384 [†]
Never	0.33 (0.07–1.53)	2.02 (1) [†]	0.155 [†]
Level of pain			
No pain	0.00 (0.00)	0.00 (1) [†]	0.999 [†]
Mild	1.77 (0.70–14.47)	1.45 (1) [†]	0.228 [†]
Moderate	1.56 (0.65–3.72)	0.98 (1) [†]	0.322 [†]
Severe	1.00		
Mothers experienced perceived no milk supply			
Too often/often	1.00		
Sometimes/seldom	3.12 (1.14–8.60)	4.87 (1) [†]	0.027 [†]
Never	5.12 (1.98–13.28)	11.28 (1) [†]	0.001 [†]
Mothers experienced cracked nipple			
Too often/often	1.00		
Sometimes/seldom	1.43 (0.35–5.79)	0.25 (1) [†]	0.617 [†]
Never	2.33 (0.69–7.85)	1.85 (1) [†]	0.173 [†]
Mothers experienced inverted nipple			
Too often/often	1.00		
Sometimes/seldom	3.84 (0.83–17.71)	2.98 (1) [†]	0.085 [†]
Never	5.45 (1.67–17.82)	7.87 (1) [†]	0.005 [†]
Mothers experienced having breast pain as baby sucks			
Too often/often	1.00		
Sometimes/seldom	4.18 (1.34–13.00)	6.11 (1) [†]	0.013 [†]
Never	2.84 (1.01–7.96)	3.94 (1) [†]	0.047 [†]
Feeding method during hospitalization			
Mixed feeding	1.00		
Exclusive breastfeeding	10.95 (4.16–28.85)	14.17(1) [†]	<0.001 [†]
Predominant feeding	4.15 (0.00)	0.00 (1) [†]	0.999 [†]

*By likelihood ratio test. [†]By Wald test.

the respondents (20.5%) very often/often felt embarrassed to breastfeed their infants in an open area. Most respondents very often/often felt easy (74.9%) and comfortable (74.2%) to breastfeed. Additionally, most respondents (74.2%) were confident that the amount of breast milk was adequate for their infants. Nearly half of the respondents (49.1%) very often/often experienced difficulty moving due to pain, and about a quarter of respondents (38.6%) had pain at the surgical site. About one-third of respondents (29.8%) very often/often had an experience of feeling tired, and 21.7% felt drowsy after undergoing cesarean delivery. More than half of respondents reported an absence of worry or sadness (59.7%), headache or dizziness (59.7%), and nausea after cesarean delivery (80.7%). About three-quarters of the respondents seldom or never perceived a lack of milk supply (71.4%) or breast pain due to breastfeeding (74.9%). Only 7% of the respondents had experience (often/very often) of cracked nipple, and approximately 7.6% of the mothers had inverted nipples.

For infant feeding methods during hospitalization, our results show that 142 infants (83.0%) were exclusively breastfed by their mothers (exclusive breastfeeding), four of them (2.4%) were predominantly fed with breast milk, as well as given other liquids (predominant breastfeeding) and 25 infants (14.6%) were given formula milk together with

breastfeeding (mixed feeding). None of the infants were given only formula milk during their hospitalization.

Factors associated with early breastfeeding initiation by simple logistic regression analysis are depicted in Table 4. Initially, at the univariate level, 31 variables were identified and tested. Among these, 21 variables had a P-value of <0.25 and were included for MLR analysis. At the univariate level, breastfeeding initiation was significantly associated with gravida, infant looking sleepy during initiation of breastfeeding, SSC initiated after cesarean delivery, mother's experience in attaching infant to the breast, women's perception of inadequate milk supply, women experiencing inverted nipple, women experiencing breast pain during breastfeeding, and feeding method during hospitalization.

Table 5 shows the results of MLR analysis of factors associated with early breastfeeding initiation among respondents. At the multivariable level, SSC initiated after cesarean delivery, method of feeding during hospitalization, and infant looking sleepy during initiation of breastfeeding remained as factors significantly associated with breastfeeding initiation after cesarean delivery. Mothers who experienced SSC after cesarean delivery had higher odds ratio (OR) of initiating breastfeeding within 1 hour of cesarean delivery by 14.42 times than mothers

Table 5. Factors associated with early breastfeeding initiation by multiple logistic regression analysis

Variable	Adjusted odds ratio* (95% confidence interval)	χ^2 (degrees of freedom) [†]	P-value
Skin-to-skin contact done after caesarean		11.08 (1) [†]	0.001 [†]
No	1.00		
Yes	14.42 (3.58–58.06)	14.10 (1) [†]	<0.001 [†]
Feeding method during hospitalization		13.10 (12) [†]	0.001 [†]
Mixed feeding	1.00		
Exclusive breastfeeding	36.37 (5.60–236.24)	14.17 (1)*	<0.001*
Predominant feeding	1.48 (0.00)	0.00 (1)*	0.999*
Infant looks sleepy during initiation of breastfeeding		9.75 (2) [†]	0.008 [†]
Yes	1.00		
No	5.17 (1.32–20.21)	14.10 (1)*	<0.001*
Not sure	0.40 (0.03–5.83)	0.44 (1)*	<0.505*

*By Wald test. [†]By likelihood ratio test.

who did not initiate SSC with their infants (OR, 14.42; 95% CI, 3.58–58.06). Mothers who exclusively breastfed during hospitalization had higher odds of initiating breastfeeding within 1 hour of cesarean delivery by 36.37 times than mothers who practiced mixed feeding (OR, 36.37; 95% CI, 5.60–236.24). Infants who were not sleepy when the mother initiated breastfeeding had higher odds of breastfeeding initiation within 1 hour after cesarean delivery than infants who looked sleepy during breastfeeding initiation (OR, 5.17; 95% CI, 1.32–20.21). Possible two-way interactions between factors were not significant, and there was no multicollinearity issue. The fit of the preliminary final model was checked. The results of the Hosmer-Lemeshow goodness-of-fit test were not significant, with P-value of 0.628, and the area under the ROC curve was 0.869, suggesting that the model was a fit. The classification table showed 81.9%, while 70% or above is considered a good model. The contribution of each outlier was verified, and none was found to be influential.

DISCUSSION

In this study, the proportion of women engaging in early initiation of breastfeeding, i.e., within 1 hour of childbirth, is 73.7%; initiation of breastfeeding within 24 hours of birth is 15.8%; and initiation of breastfeeding ≥ 24 hours is 10.5%. Our percentage for early initiation of breastfeeding within 1 hour is higher compared to the Malaysian National Health and Morbidity Survey (NHMS) of 2016, which found that only 49% of mothers who delivered via cesarean section initiated breastfeeding within 1 hour of birth. The initiation of breastfeeding within 24 hours and after 24 hours of cesarean delivery according to the NHMS is a bit higher compared to our finding, which is 30.0% and 14.9%, respectively.¹⁷⁾ A lower percentage (61.5%) of breastfeeding initiation was found in a study among Puerto Rican women and a much higher percentage (97.5%) of breastfeeding initiation was found in Canadian women during their stay in the hospital after cesarean delivery.^{11,18)}

UNICEF has reported that globally, in 2018, breastfeeding was initiated within the first hour of life for about 42% of infants. Although the

percentage of early breastfeeding initiation within the first hour of life is much higher in our study (73.7%) compared to the global percentage, it can be improved further. A systematic review and meta-analysis on delayed breastfeeding initiation and infant survival reported that among a subgroup of infants exclusively breastfed in the neonatal period, those who initiated breastfeeding more than 24 hours after birth had an 85% greater risk of neonatal mortality compared to infants who initiated less than 24 hours after birth.³⁾ Therefore, there is a need to increase the efforts to improve the rate of breastfeeding initiation within the first hour of life, since it can save lives and provide benefits that last a lifetime.¹⁾

A practice that has been associated with increased initiation of breastfeeding is SSC between infants and their mothers, allowing the infant adequate time to start his or her first suckling response naturally.⁵⁾ In the current study, about three-quarters of the respondents (77.8%) had SSC with their infants. A comparable finding was found in a study by Boyd¹⁹⁾ in 2017 where 74% of post-cesarean mothers initiated SSC contact in the operating room or in the post-anesthesia care unit. Overall, the percentage is low compared to SSC practices among women who had vaginal delivery in two district hospitals in Kelantan, where the SSC initiation was 93.4%.²⁰⁾ The lower rate of SSC in our study may be due to the method of delivery. Studies have found that delivery staff in the operating room encounter obstacles that hinder SSC between mothers and infants, including maternal or neonatal instability, equipment problems, and nurse staffing issues.^{19,21)} However, immediate SSC among mothers who have had cesarean delivery need to be increased, as studies have shown that it increases the likelihood that babies are breastfed, extends the duration of breastfeeding, and improves rates of exclusive breastfeeding.²¹⁾

In our study, nearly 30% of our respondents found that it was difficult or very difficult to attach their infant to the breast and to place their infant at the proper position for breastfeeding. This finding could be linked to the fact that the women were experiencing pain after the surgery, which limited their movement, as 49.1% of women had difficulty moving due to pain, and 38.1% had pain at the surgical site. This finding is also in agreement with a study performed in the United

States and Brazil that found pain after cesarean delivery led to maternal mobility limitations, positioning difficulties, and frustration due to the need for assistance, all of which contribute to obstacles and difficulties for mothers to breastfeed their infant.^{14,22} With regard to women's feelings toward the breastfeeding experience in the hospital, almost 80% of the mothers never/seldom/sometimes felt embarrassed to breastfeed in open areas, meaning that they were willing to breastfeed their baby with minimal hesitation and often/very often felt easy and comfortable to breastfeed. This positive finding may be associated with support from the hospital staff, especially nurses, medical officer, pediatrician, and obstetrician and may also be attributed to the implementation of the BFHI at both hospitals. Many studies have highlighted the importance of support and assistance from health care providers, particularly for patients who have undergone surgical delivery, since most women reported that they faced difficulties, especially during the first 24 hours after surgery, and that they needed strong support, encouragement, and information regarding the benefits of breastfeeding during this critical window of breastfeeding initiation.^{8,23,24}

Our results showed that early breastfeeding initiation is strongly associated with the implementation of SSC between the infant and mother. Women who initiated SSC after cesarean delivery had increased odds of initiating breastfeeding within 1 hour of cesarean delivery by 14.42 times than women who did not initiate SSC with her infant. A systematic review by Moore et al.²¹ in 2016 concluded that women who practised SSC after cesarean birth were more likely to breastfeed their infants for 1 to 4 months in the postnatal period and to breastfeed successfully. Although SSC is very important for successful breastfeeding, providing this experience in the operating room can sometimes be quite challenging to the surgical staff. Midwives have admitted that they experience many obstacles to aid in providing mothers with this experience, such as lack of knowledge about the benefits of SSC, the mother's condition after the cesarean section, and other difficulties, such as lack of time.²⁵ However, the challenges usually faced by medical staff in implementing SSC can be overcome by training them appropriately in order to successfully implement SSC after cesarean delivery.²³ Nevertheless, it is important to emphasize and strengthen step 4 of BFHI among the surgical staff by placing at least 80% of babies born via cesarean sections without general anesthesia and at least 50% of babies born via cesarean deliveries with general anesthesia to have SSC with their mothers within 5 minutes of birth, or as soon as the mothers were responsive and alert.⁵ The implementation of SSC immediately after the surgery is a very important factor both for the initiation of breastfeeding as well as the fulfillment of a mother's need to be close to her baby.

Another factor found to be associated with early breastfeeding initiation was women who practiced exclusive breastfeeding during hospitalization. Women who practiced exclusive breastfeeding during hospitalisation had increased odds (36.37 times) of initiating breastfeeding within 1 hour of cesarean delivery than mothers engaged in a mixed feeding practice. This finding indicates the importance of early

initiation of breastfeeding that leads to continuation of exclusive breastfeeding practice while the mother is hospitalized, which will continue until the infant is 6 months of age. A systematic review by Prior et al.¹⁰ concluded that for mothers who initiated breastfeeding, cesarean delivery had no apparent effect on the number of mothers still breastfeeding at 6 months. This finding is in agreement with a study performed in Taiwan that found that initiation of breastfeeding within 30 minutes of delivery was associated with higher odds of breastfeeding at 1 and 3 months after delivery. However, in women who did not initiate breastfeeding during hospital stay, but breastfed at 1 month after delivery, had lower odds of breastfeeding at 3 months after delivery.²⁴ Therefore, it is important after cesarean delivery for medical staff to encourage mothers to practice exclusive breastfeeding during hospitalization, since studies have shown that the prevalence of exclusive breastfeeding at hospital discharge was lower (70.6%) among respondents who gave birth by cesarean delivery compared with 79.9% of women who gave birth vaginally. Women who give birth by cesarean delivery may require additional attention, assistance, and encouragement during their hospital stay to improve rates of exclusive breastfeeding at discharge.²⁶

Our study also observed that 'baby looking sleepy' is a significant factor associated with early breastfeeding initiation. Infants who were not sleepy when the mother initiated breastfeeding had higher odds of breastfeeding initiation within 1 hour after cesarean delivery than infants who looked sleepy during breastfeeding initiation. In this study, amongst 91.8% of infants who initiated breastfeeding, 29.2% of them looked sleepy during the initiation attempt. A study done by Sayers et al.²⁷ found that 17% of mothers discontinued breastfeeding due to a sleepy baby. A sleepy baby can be a source of frustration to mothers during initiation, or early days of breastfeeding since mothers can misinterpret that their baby was not interested in breastfeeding or that mother had insufficient milk.^{14,28} Thus, mothers need to be educated that a sleepy baby needs to be unwrapped when he is too warm at the time that the baby's sucking response decreases, and he needs to be able to bring his hands to his mouth to wake himself up as a signal that he needs to feed. Mothers also can massage and squeeze the breast each time the baby pauses between sucking bursts, as this increases both the volume and caloric content of the feed.²⁸ Importantly, mothers of babies who are sleepy after cesarean birth also need additional assistance with early expressing to encourage milk supply.¹⁶ Parents also need to be reassured that this type of sleepiness is temporary, and that their baby will soon be able to signal his needs quite clearly.²⁸ Therefore, postpartum education of mothers regarding the fact that some infants are sleepy in the first 24 hours after birth, that they usually fall asleep, and that they release the breast spontaneously when satiated is important. Mothers also need to be educated regarding infant positioning, infant feeding cues, latching, and milk transfer, since this will help them gain a greater understanding regarding the problems that they may face when initiating breastfeeding.²⁹

In conclusion, the number of mothers that undergo elective cesarean delivery mothers who initiate breastfeeding within 1 hour can still

be improved. Therefore, continuous education by health practitioners starting from the antenatal period is very important to emphasize the importance of breastfeeding initiation early on among mothers who plan to undergo elective cesarean delivery. Support from healthcare providers and family members, especially from their partners or husband, is a very important factor for women to feel confident to face any challenge, as it has been shown that women who receive breastfeeding support from their partners or the infant's father during the early postpartum period were more likely to initiate breastfeeding and had longer breastfeeding duration.³⁰⁾

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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