



■ Original Article

Unsuccessful Exclusive Breastfeeding and Associated Factors among the Healthcare Providers in East Coast, Malaysia

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Background: Breastfeeding is widely recognized as the optimal and natural method of feeding infants. However, there are obstacles that can limit exclusive breastfeeding practices during the first 6 months of an infant's life. This study aimed to determine the prevalence of unsuccessful exclusive breastfeeding and its associated factors among mothers who work as healthcare providers at Universiti Sains Malaysia Hospital.

Methods: A cross-sectional study was conducted among 295 medical doctors and staff nurses from June to December 2015. Simple random sampling was applied. The data were collected using a self-administered questionnaire and analyzed using IBM SPSS ver. 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics and logistic regression analysis were performed.

Results: The prevalence of unsuccessful exclusive breastfeeding among the study participants was 58.3%. Mothers who preferred formula milk (odds ratio [OR], 4.40; 95% confidence interval [CI], 1.45–13.31) delivered via lower segment cesarean section (OR, 2.31; 95% CI, 1.07–4.98) and produced inadequate breast milk (OR, 4.06; 95% CI, 2.40–6.89) were significantly associated with unsuccessful exclusive breastfeeding.

Conclusion: The prevalence of unsuccessful exclusive breastfeeding among the study participants was high. Maternal characteristics such as preference towards formula milk, mode of delivery and adequacy of breast milk must be assessed to prevent unsuccessful exclusive breastfeeding among healthcare providers.

Keywords: Association; Breast Feeding; Exclusive Breastfeeding; Human Milk

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INTRODUCTION

Breastfeeding benefits not only infant nutrition, but also provides unique non-nutritional benefits to the infant, such as optimizing growth and development.^{1,2)} It also reduces the risk of gastrointestinal tract infections and atopic eczema in infants.³⁾ Breastfeeding also benefits maternal health and well-being, by influencing pregnancy spacing and reducing the risk of breast and ovarian cancer.⁴⁾ Therefore, exclusive breastfeeding (EBF) practices need to be enhanced for infants and mothers to experience the utmost health benefits.

In accordance with the 2001 World Health Assembly Resolution 54.2, the National Breastfeeding Policy was developed in 1993 and further revised in 2005. It suggested EBF to newborns until at least 6 months old and continued up to 2 years of age and beyond with judicious, sufficient, and safe complementary food.⁵⁾ Although there is extensive research showing the benefits of breastfeeding, and the government has implemented many strategies to improve EBF, it is still not widely practiced in Malaysia. The Malaysia National Health and Morbidity Survey (2006) reported that of the 94.7% of women who have ever breastfed their infants, only 19.3% practiced EBF for at least 4 months and only 14.5% still practiced EBF at 6 months.^{6,7)}

Deciding how to feed an infant is a complex process that is influenced by psychological and social status, as well as economic factors and healthcare systems.⁸⁾ Many factors lead to unsuccessful EBF (UnEBF) in working mothers, such as returning to work, insufficient breast milk,⁹⁾ satisfactory previous experiences with bottle feeding,¹⁰⁻¹²⁾ duration of maternity leave, parity of mothers, mode of delivery, and gestational age of infant at delivery.¹²⁻¹⁴⁾ The social background of mothers, such as support from a husband or mother-in-law, and the practice of bed sharing with an infant played an important role in deciding to breastfeed and breastfeeding success.^{11,13)}

Healthcare providers play a significant role in promoting breastfeeding practices. The successfulness of EBF promotion depends on the healthcare provider's knowledge, attitude, motivation, and communication skills. The healthcare provider's personal breastfeeding experiences influence their attitude toward breastfeeding and expertise in counseling and managing breastfeeding issues in patients. Studies have been conducted on the breastfeeding practices among healthcare providers in a few countries.^{15,16)} However, the latest data available on Malaysian healthcare providers was from 1980.¹⁷⁾ Thus, this study aimed to determine the present proportion of UnEBF among the healthcare providers who are supposed to encourage the community to practice EBF. We also aimed to discover the associated factors of UnEBF among the healthcare providers. We hoped that apart from providing new data, we would identify solutions for breastfeeding issues and improve breastfeeding practices among the Malaysian population in general.

In our study, EBF was defined as a mother who only fed her child breast milk (direct or expressed) without additional food or water, excluding drops or syrups containing vitamins, mineral supplements, or medicines, for the first 6 months of the infant's life.¹⁸⁾ UnEBF was de-

defined as non-exclusive breastfeeding.

METHODS

This was a cross-sectional study conducted from June to December 2015 in Universiti Sains Malaysia (USM) Hospital, a tertiary hospital located in Kelantan, in northeast Peninsular Malaysia.

Inclusion criteria were female healthcare providers who have a child from the age of 6 months to 2 years. Single mothers were excluded from the study. The sample size was calculated using a single proportion formula with a non-EBF prevalence value of 0.81.¹⁵⁾ The calculated sample size was 236 and after considering a 20% dropout rate, the total sample size was 295 participants. A list of 2,205 female healthcare providers (medical doctors and staff nurses) working at USM Hospital was obtained from the Human Resources Department. Of those, 804 healthcare providers met the inclusion and exclusion criteria. Thus, a new list of eligible study participants was prepared and simple random sampling was applied to the list using Microsoft Excel (Microsoft Corp., Redmond, WA, USA).

A structured, self-administered questionnaire was developed using content and face validity in Malay, the national language. Five panels of experts, including obstetricians, breastfeeding counsellors, and those involved in breastfeeding research, reviewed the degree of relevance and content validity of the questionnaire. Ten doctors and nurses from primary health clinics reviewed the face validity of the questionnaire, including the degree of clarity and the degree of comprehension. The questionnaire comprised two sections: (1) socio-demographic characteristics including age, ethnicity, education, occupation, workplace (either in clinic or ward), bed sharing practices, support from husband, and support from mother-in-law; (2) maternal characteristics including number of children, mode of delivery, gestational age of infant at delivery, duration of maternity leave, adequacy of breast milk, breast pain, and infant feeding preferences.

Each eligible participant was approached individually. The study was explained and informed consent was obtained. The questionnaire was distributed to each participant. Breastfeeding information of the participants was asked. The questionnaire was collected after checking for completeness. The privacy and confidentiality of participants and data were respected at all times.

Data entry and analyses were performed using IBM SPSS software ver. 22.0 (IBM Corp., Armonk, NY, USA). Categorical variables were expressed as frequency and percentage. Simple logistic regression was used to screen the factors associated with UnEBF and factors with $P < 0.25$ were further analyzed by multiple logistic regression, while other confounders in the model were adjusted. P-values less than 0.05 were considered statistically significant. Odds ratios (OR) were calculated using a 95% confidence interval (CI) to determine the association between the independent variables and UnEBF. The dependent variable was breastfeeding, and the independent variables were age, ethnicity, education, occupation, workplace, bed sharing practices, support from mother-in-law and the participant's own mother, parity,

mode of delivery, gestational age at delivery, duration of maternity leave, adequacy of breast milk, breast pain, and infant feeding preferences of the mother.

This study protocol was approved by the Human Research Ethics Committee of Universiti Sains Malaysia on June 1, 2015 (USM/JE-PeM/14090320; IRB registration no., 00004494), and procedures followed were in accordance with the Helsinki Declaration of 1975. The study participants provided their signed consent.

RESULTS

All 295 healthcare providers participated in the study (100% response rate).

1. Baseline Characteristics

The majority of the participants were Malay (87.7%), nurses (60%), and worked in the ward (67.7%). About 245 participants (83%) delivered vaginally and 171 participants (58%) were on maternity leave for 3 months. Socio-demographic and maternal characteristics of the participants are shown in Table 1.

2. Associated Factors of Unexclusive Breastfeeding

Approximately 172 participants (58.3%) experienced UnEBF. The results from the simple and multiple logistic regression analyses used to evaluate factors associated with UnEBF are shown in Tables 2 and 3. Simple logistic regression showed an association between ethnicity, workplace, bed sharing practices, mode of delivery, gestational age at delivery, duration of maternity leave, adequacy of breast milk, mother had pain at breast and mother's preference for infant feeding with UnEBF, with P-value less than 0.25. Finally, from multiple logistic regression analysis, mode of delivery, adequacy of breast milk and mother's preference for infant feeding were found to be significantly associated with UnEBF. Mothers who delivered via lower segment cesarean section (CS) were 2.31 times more likely to have UnEBF compared to mothers who delivered via spontaneous vaginal delivery (95% CI, 1.07–4.98). The odds ratio of the incidence of UnEBF for participants with inadequate and adequate breast milk was 4.06 (95% CI, 2.4–6.89). In terms of preference for infant feeding, mothers who preferred formulae milk was 4.4 times more likely to become UnEBF.

DISCUSSION

1. Prevalence of Unexclusive Breastfeeding among Participants

The prevalence of UnEBF among study participants in USM Hospital for the first 6 months post-delivery was 58.3%. It was lower than the 85.5% reported by the National Health and Morbidity Survey in 2006.⁷⁾ Perhaps the prevalence decreased tremendously with the help of the implementation and emphasizing the National Breastfeeding Policy which was created in 1993, and revised in 2005, and adapted to the World Health Organization/the United Nations Children's Fund Baby-

Table 1. Socio-demographic and maternal characteristics of the participants

Characteristic	Successful breastfeeding (n=123)	Unsuccessful breastfeeding (n=172)
Socio-demographic characteristics		
Age groups (y)		
<30	39 (31.7)	48 (27.9)
≥30	84 (68.3)	124 (72.1)
Ethnicity		
Malay	111 (90.2)	145 (84.3)
Non-Malay	12 (9.8)	27 (15.7)
Educational status		
Secondary school & diploma	71 (57.7)	89 (51.7)
Degree/master	52 (42.3)	83 (48.3)
Occupation		
Nurse	77 (62.6)	98 (57.0)
Doctor	46 (37.4)	74 (43.0)
Workplace		
Ward	77 (62.6)	123 (71.5)
Clinic	46 (37.4)	49 (28.5)
Practice of bed sharing		
Yes	121 (98.4)	160 (93.0)
No	2 (1.6)	12 (7.0)
Support from husband		
Yes	123 (100.0)	165 (95.9)
No	0	7 (4.1)
Support from mother-in-law		
Yes	35 (28.5)	54 (31.4)
No	88 (71.5)	118 (68.6)
Maternal characteristics		
No. of children		
One	29 (23.6)	49 (28.5)
Multiple	94 (76.4)	123 (71.5)
Mode of delivery		
Vaginal delivery	112 (91.1)	133 (77.3)
Lower segment cesarean section	11 (8.9)	39 (22.7)
Gestational age at delivery (wk)		
<37	9 (7.3)	25 (14.5)
≥37	114 (92.7)	147 (85.5)
Duration of maternity leave		
2 wk	17 (13.8)	49 (28.5)
2 mo	32 (26.0)	26 (15.1)
3 mo	74 (60.2)	97 (56.4)
Adequacy of breast milk		
Adequate	92 (74.8)	65 (37.8)
Inadequate	31 (25.2)	107 (62.2)
Breast pain		
Yes	5 (4.1)	20 (11.6)
No	118 (95.9)	152 (88.4)
Mother's preference for infant feeding		
Toward breastfeeding	119 (96.7)	140 (81.4)
Toward formula milk	4 (3.3)	32 (18.6)

Values are presented as number (%).

Friendly Hospital Initiative by the Ministry of Health.^{5,19)} The policy recommends EBF for the first 6 months of life and continued up to 2 years. Complementary foods should be introduced to the infants at the age of 6 months.

There is very limited data on the prevalence of breastfeeding among

Table 2. Simple logistic regression analysis for unsuccessful exclusive breastfeeding

Variable	Crude odds ratio (95% confidence interval)	Wald statistic	P-value
Age group (y)			
<30	1		
≥30	1.20 (0.72–1.99)	0.50	0.481
Ethnicity			
Malay	1		
Non-Malay	1.72 (0.84–3.55)	2.17	0.141
Educational status			
Secondary school & diploma	1		
Degree/master	1.27 (0.80–2.03)	1.03	0.310
Occupation			
Nurse	1		
Doctor	1.26 (0.79–2.03)	0.94	0.333
Workplace			
Wards	1		
Clinics	0.67 (0.41–1.09)	2.60	0.107
Practice of bed sharing			
Yes	1		
No	4.54 (1.00–20.65)	3.83	0.050
Support from mother-in-law			
Yes	1		
No	0.87 (0.52–1.44)	0.29	0.588
No. of children			
One	1		
Multiple	0.77 (0.46–1.32)	0.89	0.346
Mode of delivery			
Vaginal delivery	1		
Lower segment cesarean section	2.99 (1.46–6.10)	9.00	0.003
Gestational age at delivery (wk)			
<37	1		
≥37	0.46 (0.21–1.03)	3.53	0.060
Duration of maternity leave			
2 wk	1		
2 mo	0.28 (0.13–0.60)	10.77	0.001
3 mo	0.46 (0.24–0.85)	6.03	0.014
Adequacy of breast milk			
Adequate	1		
Inadequate	4.89 (2.93–8.14)	37.08	<0.001
Breast pain			
Yes	1		
No	0.32 (0.12–0.88)	4.84	0.028
Mother's preference for infant feeding			
Toward breastfeeding	1		
Toward formula milk	6.80 (2.34–19.78)	12.38	<0.001

medical personnel in Malaysia. A study by Sinniah et al.¹⁷⁾ among 317 nursing personnel of all categories in five representative centers in Malaysia revealed that the prevalence of UnEBF at 6 months was 94.6%. There was no known data on breastfeeding practice among medical doctors in Malaysia, even though they play a major role in promoting breastfeeding practice.^{1,16,20)} Healthcare providers who provide antenatal care should discuss the benefits of breastfeeding with their patients, partners and other family members.

Another local study, which was conducted among 290 employed mothers in Selangor, reported that 51% of participants had discontin-

Table 3. Multiple logistic regression analysis for unsuccessful exclusive breastfeeding

Variable	Adjusted odds ratio* (95% confidence interval)	Wald statistic	P-value
Ethnicity			
Malay	1		
Non-Malay	(0.44–2.74)	0.04	0.84
Workplace			
Wards	1		
Clinics	(0.99–3.10)	3.74	0.053
Practice of bed sharing			
Yes	1		
No	(0.10–3.04)	0.46	0.496
Mode of delivery			
Vaginal delivery	1		
Lower segment cesarean section	2.31 (1.07–4.98)	4.58	0.032
Gestational age at delivery (wk)			
<37	1		
≥37	(0.62–3.68)	0.814	0.367
Duration of maternity leave			
2 wk	1		
2 mo	(0.74–3.47)	1.415	0.234
3 mo	(0.35–1.35)	1.18	0.276
Adequacy of breast milk			
Adequate	1		
Inadequate	4.06 (2.40–6.89)	27.06	<0.001
Breast pain			
Yes	1		
No	(0.49–4.64)	0.49	0.48
Mother's preference for infant feeding			
Toward breastfeeding	1		
Toward formula milk	4.40 (1.45–13.31)	6.87	0.009

Multicollinearity does not exist and no significant interaction present. Model assessment met. The Hosmer-Lemeshow test showed $P>0.05$, the classification table (overall correctly classified percentage) was $>70\%$, and the area under the receiver operating characteristic curve was $>70\%$.

*Backward logistic regression was applied.

ued breastfeeding with 54% breastfeeding for less than 3 months.²¹⁾ Thirty-five percent discontinued breastfeeding after 3 to 6 months, and 12% discontinued breastfeeding after 6 months. Their occupational backgrounds were varied and included professional, non-professional or managerial, support staff, and manual workers. Although the occupational backgrounds between their study and ours differed, the prevalence of UnEBF was about the same. Both studies showed that the practice of breastfeeding in Malaysia among working mothers was less than 50% after 6 months.

A study in Nigeria reported that approximately 38% of female doctors in a tertiary health institution did not practice EBF. This became a major concern as the practice of EBF among them ought to be higher than the lay women as they have a better knowledge of benefits of breastfeeding.²⁰⁾ Another study among female physicians and nurses in China found that 30.8% did not initiate breastfeeding at all, 19.1% were still breastfeeding at 4 months and less than 1% continued to breastfeed for more than 1 year.¹⁵⁾

2. Factors Associated with Unexclusive Breastfeeding

A few studies concluded that there were many obstacles that make it difficult for working mothers to successfully breastfeed, including breast milk insufficiency, returning to work, and social support.^{8,12)} In this study, mode of delivery, adequacy of breast milk, and the mother's infant feeding preferences were the factors significantly associated with UnEBF.

Mothers who delivered via CS were less likely to exclusively breastfeed their infants compared to those who delivered vaginally, which paralleled a study in China by Ouyang et al.¹⁵⁾ A study by Hobbs et al.¹⁴⁾ in Alberta similarly reported that mothers who delivered via a planned CS were more likely to discontinue breastfeeding before 3 months. This association between CS and practice of breastfeeding was particularly related to a higher rate of planned CS mothers that did not intend to breastfeed or did not initiate breastfeeding their infants compared to vaginal delivery mothers.¹⁴⁾ During the process of initiating breastfeeding, mothers are encouraged to have early skin-to-skin contact (SSC). SSC has been shown to have a statistically significant association with EBF rates among the CS mothers who experience early SSC is likely to breastfeed up to 6 months.²³⁾ Mothers who delivered via CS experienced a longer time between birth and SSC than mothers who delivered vaginally.²³⁾ A systematic review of 52 breastfeeding studies showed a negative association between CS and early breastfeeding; however, in mothers who initiated breastfeeding, CS does not have an effect on breastfeeding at least 6 months.²⁴⁾ Due to many studies conducted worldwide that have reported a negative association between CS deliveries and breastfeeding, pregnant women and healthcare providers should be aware of this matter. Measures should be taken to improve the first instance an infant is breastfed. For example, breastfeeding guidance could be provided to women considering a planned CS.

Inadequate breast milk continues to be a major reason mothers discontinue breastfeeding worldwide. The condition can be either real or perceived and is defined as a mother's feeling that her milk is not enough to either satisfy her child's hunger or support sufficient weight gain.²⁵⁾ Based on a systematic review, approximately 35% of all women who before 6 month reported "perceived insufficient milk" as the primary reason. Mothers who had inadequate breast milk were less likely to exclusively breastfeed their infants, which is similar to the results of our study.^{9,26,27)} A study of 800 mothers in Egypt showed that 92.2% perceived that their infants were still hungry after breastfeeding, and 89.9% thought that they produced insufficient milk.²⁶⁾ Another study in Jordan revealed that 53% of mothers had an inadequate supply of breast milk, which hindered them from fully breastfeeding their infants.²⁷⁾ A study in Mauritius showed that 82% of mothers experienced UnEBF, and of those, 22% stated milk insufficiency was the main factor.⁹⁾

The socio-demographic backgrounds of the studies in Egypt, Jordan, and Mauritius included mainly mothers of whom the majority were less than 30 years old, contrasting with our study background. Less than half of the mothers in the reference studies attained at least a

secondary education,^{9,26)} and only 24% were employed.²⁷⁾

Based on these findings, we can conclude that regardless of the socio-demographic background data of the studied population, inadequate breast milk is a common factor that prevents mothers from exclusively breastfeeding their infants. This could be attributed to multiple factors. Primarily, the inability to fully lactate was related to anatomic breast abnormalities and abnormal hormone concentrations.²⁸⁾ Secondary causes are much more common and are usually associated with maternal conditions or infant factors.²⁹⁾

Mothers that preferred to feed infants with formula milk were more likely to experience UnEBF. Motee et al.⁹⁾ reported that the two main reasons mothers opt to for formula feeding are insufficient milk production and work resumption. Several other factors which influence the mothers feeding preferences include satisfaction with a previous bottle feeding experience¹⁷⁾ and supplemental formula feedings during a hospital stay in first-time mothers with intention to breastfeed.³⁰⁾ Mothers who intended to breastfeed their infants had a higher chance of exclusively breastfeeding their infants after delivery.¹⁴⁾

Our study found out that mother-in-law support was not significantly associated with UnEBF. However, a few studies have reported that family members play an important role in influencing whether the mothers continue to breastfeed their infants. Extended families, namely grandmothers, are an important source of support for new mothers.^{31,32)} Amin et al.²¹⁾ reported that almost all husbands were very supportive of breastfeeding. Similar findings were reported by Ogbo et al.,³³⁾ in which a lack of partner support was a significant determinant of EBF cessation. Live-in family members that are able to help with home-related tasks can ensure the breastfeeding mother is well-rested and well-nourished so that she can successfully breastfeed.

There are a few limitations in our study. The retrospective study design involved asking participants to describe their breastfeeding experiences over a period of 6 months to 2 years, introducing the risk of recall bias and inaccurate data. Future research which include those associated factors should be considered. Finally, our study reflected a specific subgroup of mothers employed as medical personnel. Thus, generalizing our results to other populations should be interpreted with this in mind.

In conclusion, more than half of our study participants experienced UnEBF. Participants who delivered via lower segment CS, had inadequate breast milk, and preferred formula milk for infant feeding were not likely to exclusively breastfeed their infants.

CONFLICT OF INTEREST

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

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