

The Effectiveness of Breastfeeding Intervention on Breastfeeding Exclusivity and Duration among Primiparous Mothers in Hospital Universiti Sains Malaysia

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Fauzi ROSUZEITA¹, Mohamed CHE RABIAAH², Ismail ROHANI²,
Othman MOHD SHUKRI³

¹ Centre for Nursing Studies, Faculty of Health Sciences, Universiti Teknologi MARA Selangor, Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia

² School of Health Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

³ School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

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Abstract

Background: In Malaysia, the rates of mothers practising breastfeeding exclusively among babies at six months of age still do not achieve the Global Nutritional Targets 2025 which is 50%.

Objective: To determine the effectiveness of breastfeeding intervention in improving breastfeeding outcomes.

Method: A quasi-experimental design was used involving a purposive sample of 96 primigravidas (intervention group (IG) = 48, control group (CG) = 48) recruited at Hospital USM. Data were collected using the Breastfeeding Assessment Questionnaire. Mothers in IG received the current usual care and two hours of an additional education programme on breastfeeding, breastfeeding booklet, notes from the module, and postnatal breastfeeding support in the first week of postpartum. Mothers in CG received the current usual care only. The mothers were assessed on the first and sixth week and then the fourth and sixth month of postpartum.

Results: The results indicated that there was a statistically significant difference between the groups on the fourth month postpartum ($X^2 = 5.671$, $P = 0.017$) in practicing full breastfeeding. The breastfeeding duration rates of the IG were longer than those of the CG. However, the results showed only two follow-up weeks that were significant (week 6, $X^2 = 5.414$, $P = 0.020$, month 4, $X^2 = 7.515$, $P = 0.006$). There was a statistically significant difference between IG and CG as determined by one-way ANCOVA on the breastfeeding duration after controlling age and occupation, $F(3, 82) = 6.7$, $P = 0.011$. The test revealed that the breastfeeding duration among IG was significantly higher (20.80 ± 6.31) compared to CG (16.98 ± 8.97).

Conclusions: Breastfeeding intervention can effectively increase breastfeeding duration and exclusivity outcomes among primiparous mothers.

Keywords: breastfeeding, breastfeeding intervention, exclusivity, duration, primiparous

Introduction

Breastfeeding is the best way to provide complete nutrients for infants to achieve the maximum healthy growth and development. Practically, most mothers can breastfeed their infants with the accurate information distributed to them regarding breastfeeding practice by protecting and giving support to mothers, their spouse and family, and the healthcare provider, and community (1).

Exclusive breastfeeding is defined as an infant that receives only breast milk while no other fluids or foods are given until the infants reach six months of age. However, infants who are exclusively breastfed may still receive vitamins, mineral supplements, oral rehydration solution or medicines in the form of drops or syrups, if needed (2). Since 2003, World Health Organisation (WHO) recommends mothers globally to give exclusive breastfeeding to their infants until six months of age. Thereafter, infants should be introduced to safe complementary (solid) foods at six months while breastfeeding needs to sustain for up to two years of life or longer (2).

In Malaysia, even though more awareness campaigns on the benefits of breastfeeding were conducted among the public and especially, mothers, the results of exclusive breastfeeding still remain low than the rate recommended by WHO (3). Based on the National Health and Morbidity Survey 2016 (4), the rate of babies being exclusively breastfed up to six months still did not achieve the global nutrition targets 2025 (3), even though there was an increase from 23.3 in 2011 to 47.1% in 2016. Furthermore, the data showed the percentage of exclusive breastfeeding for six months declined from 49.4% in 2015 to 47.1% in 2016 compared to the finding from the state health department in 2015 (5). However, there was an increase in the percentage of exclusive breastfeeding for babies up to four months of age from 44.9% (2010) to 47.4% (2016). Despite more awareness of the many benefits of breastfeeding, the rates often decrease from the recommended practice by WHO. Based on the results of a previous study (6), almost half of mothers (45.6%) who stopped giving exclusive breastfeeding to their infants at one month postpartum were associated with delayed initiation of breastfeeding and breastfeeding difficulties.

The government reinforces breastfeeding environment by encouraging involved parties to

create breastfeeding facilities in public areas as well as workplace and support mothers who want to breastfeed by providing the appropriate health service to them. Mothers who attended the clinic and hospital either in rural or urban areas were encouraged by trained healthcare workers to continue breastfeeding their children until two years of age and beyond.

Materials and Methods

Approval was received from the Human Research Ethics Committee Universiti Sains Malaysia (USM/JEPeM/140382) and compiled with the Declaration of Helsinki.

Study Design

This study applied a quasi-experimental design, with the Control Group (CG) receiving the current usual care and Intervention Group (IG) given the current usual care plus an additional education programme on breastfeeding during the prenatal period and postnatal breastfeeding support sessions.

Setting

The study was conducted at Hospital Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan. The sample consisted of 96 mothers who were primigravida at 24 week age of gestation or later and attending follow-up visits at the Obstetrics and gynaecology (O&G) clinic or received treatment at the antenatal ward at Hospital USM.

Sample

In this study, a purposive sampling was used during the selection of potential mothers at the O&G clinic and antenatal ward. It was chosen because the number of primigravida mothers who received antenatal care at the O&G clinic and antenatal ward was limited. The volunteer and eligible mothers were assigned to two study arms to IG versus CG (non-intervention group). For the group allocation of participants, mothers who were attending the clinic or antenatal ward on Sunday during the recruitment phase were assigned to IG, and those attending on Tuesday were allocated to CG to prevent them from meeting each other and minimise any potential data contamination. Sundays and Tuesdays were chosen because those days were the antenatal check-up days for mothers at the O&G clinic, Hospital USM. There were a few criteria considered;

The inclusion criteria in this study are:

- (a) Primigravida with 24 week age of gestation or later
- (b) Primiparous mother who delivered a full term, healthy infant via spontaneous vaginal delivery or caesarean section
- (c) Received antenatal care at O&G clinic or treatment at the antenatal ward at Hospital USM
- (d) No illness that would contraindicate breastfeeding after delivery
- (e) Ability to understand and communicate in spoken Malay
- (f) Have the intention to breastfeed
- (g) Plan to give birth at the Hospital USM
- (h) Have telephone access

The exclusion criteria in this study are:

- (a) A mother whose illness or medication prevented her from breastfeeding the infant such as preterm classification of infant, positive Human Immunodeficiency Virus (HIV) status, and postpartum blue mother
- (b) Maternal use of prohibited medications or drugs or maternal use of chemotherapy
- (c) Infant admitted to the Neonatal Intensive Care Unit (NICU) and had a condition that prevented the ingestion of breast milk via the breast such as cleft palate
- (d) Stated intention to bottle feed with formula
- (e) Mother received or attended any comprehensive breastfeeding classes or workshop

Sample Size Determination

The sample size was determined by using the PS Software (1997) with two proportions. The sample size calculation was based on the planning of the study of independent cases with 1 control per independent case. In a previous study (7), prior data indicated that the failure rate among controls was 0.98. If the true failure rate for experimental subjects was 0.78; thus, the study needed 40 experimental subjects and 40 control subjects to be able to reject the null hypothesis where the failure rates for experimental and control subjects were equal with the probability (power) 0.8. The Type I error probability associated with the test of this null hypothesis was 0.05. It was recommended

to add 20% to any drop-outs. Based on the calculation, the required sample size was 48 per group (96 participants in all).

Instrument

Breastfeeding Assessment Questionnaire

A survey using breastfeeding assessment questionnaire was carried out within the first and sixth weeks and then the fourth and sixth months of follow-up visits after delivery, and was conducted via phone. This structured questionnaire was used to assess breastfeeding practices (duration and exclusivity) and adapted from the previous study by Dennis et al. (7) with the permission of the authors. Dennis et al. developed the questionnaire according to the scheme devised by Labbok and Krasoves (9). This questionnaire was not available in Malay, thus a validation study was conducted for the Malay translated version. A validated Malay questionnaire was utilised. The content and format of the questionnaire was reviewed by several experts.

The structured questionnaire contained three questions; the first and second questions were regarding how the mother fed her baby while the third question was regarding the specific breastfeeding category by using the algorithm of the classified level of exclusivity. The categories of infant feeding are based on outlined in Table 1.

Breastfeeding is defined as receiving any breast milk via bottle or breast. If the mothers discontinued breastfeeding on the first and sixth weeks, and the fourth and six months of postpartum, the breastfeeding duration would be recorded from the date of the infant's birth until the date of breastfeeding cessation. Duration was a continuous variable, measured based on the baby's age (in weeks) on the last completed week of breastfeeding, or in days if being weaned in the first week of life. Mothers were followed up until the sixth months of postpartum or when weaned from breast milk to formula feeding, whichever came first. The interview was conducted personally by phone by the researcher.

Intervention

Prenatal Breastfeeding Education

The implementation of prenatal breastfeeding education intervention was scheduled at around 28 weeks of gestation and

Table 1. Categories of infant feeding

Category of Infant Feeding	Requires the Infant to Receive	Allows the Infant to Receive	Does Not Allow the Infant to Receive
Exclusive breastfeeding	Breast milk (including milk expressed)	Vitamins, minerals, medicines	Anything else
Almost exclusive breastfeeding	Breast milk as the predominant source of nourishment	< 1 bottle/week of non-human milk, water, water-based drinks, fruit juice, ORS, holy water	Anything else
High breastfeeding	Breast milk as the predominant source of nourishment	> 1 bottle/week of non-human milk but < 1 bottle per day	1 bottle/day of non-human milk
Partial breastfeeding	Breast milk and any food or liquid	> 1 bottle/day of non-human milk or any food or liquid	
Token breastfeeding	Non-human milk or any food or liquid as the predominant source of infant nourishment	Breast is used for comfort or to console the infant with minimal nutritional contribution	
Bottle feeding (formula)	Any food or liquid		

Source: Labbok and Krasovec (1990)

later, or as soon as possible after that for those who signed up late for the study. The mother in IG received the standardised education module. The development of the module was based on the guideline from the Training Module for Health Profession on breastfeeding promotion by WHO/United Nations Children's Fund (UNICEF) in 2009, the health ministry and from other references as well. The content of the slide presentation was distributed to the mothers as an additional visual note. The two-hour module contents cover breast anatomy, how milk is produced, advantages of breastfeeding, positioning, latch on, a sign of milk sufficiency, early feeding cues, common problems and solutions, formula cost, prenatal preparation, manual expression, breast pump selection, storage of human milk, and diet for the mother.

The guide booklets on breastfeeding titled “*Titisan kasih; Setitis susu ibu kasih sepanjang hayat*” were given to the mothers. Besides that, the educational video entitled “*Nature's Way: Video Guide to Breastfeeding*” by Hayley Wagner, an International Board Certified Lactation Consultant was shown. This video covers the benefits of breastfeeding, how long the mother should breastfeed, how milk is produced, diet for a breastfeeding mother, positioning and latching, how to know babies are getting enough milk, and pumping and storage of breast milk. The demonstration and return demonstration

of breastfeeding position were practiced. The model of the breast, infant mannequin, and equipment for hand expression were used during this session for the demonstration and practical session. The current usual care used in this study was defined according to Norzakiah and Nabila (10). The usual care definition is “This usual care included breastfeeding talks during immunisation, a mothers’ communication with the lactation counsellors through information or pamphlets received during antenatal or postnatal follow-up, and advice regarding breastfeeding received at any time from any health care workers, the media, peer counsellors, family members or friends”.

Postnatal Breastfeeding Support

Within one week of the postpartum period, the mothers received one-time postnatal breastfeeding support from the researcher. The researcher visited the mother while she was in the hospital to provide support for breastfeeding. The support given included information about breastfeeding, encouragement on exclusive breastfeeding for six months, answering questions and discussing doubt, assistance in the establishment of breastfeeding (video on the latch on and positioning was shown), manual expression, and management of nipple damage or any problem regarding breastfeeding.

Data collection Data

Statistical Analysis

Descriptive statistics were used to analyse the demographic data, non-demographic and breastfeeding compliance by using counts, proportions, means and standard deviations. Means and standard deviations were calculated for continuous variables and frequencies and percentages for categorical variables. Data were kept and analysed using the IBM SPSS Statistics.

The level of significance was $P < 0.05$, power 0.80, and attribution was 20%.

In the first analysis, the category of exclusive breastfeeding used a descriptive statistic by using a proportion to look at the different outcome for each category of breastfeeding. Then, for the second analysis, dichotomous independent variables from the exclusivity outcome were compressed into a full breastfeeding versus non-full breastfeeding, where a chi-square was used (with Fisher's exact test as indicated). The first analysis on

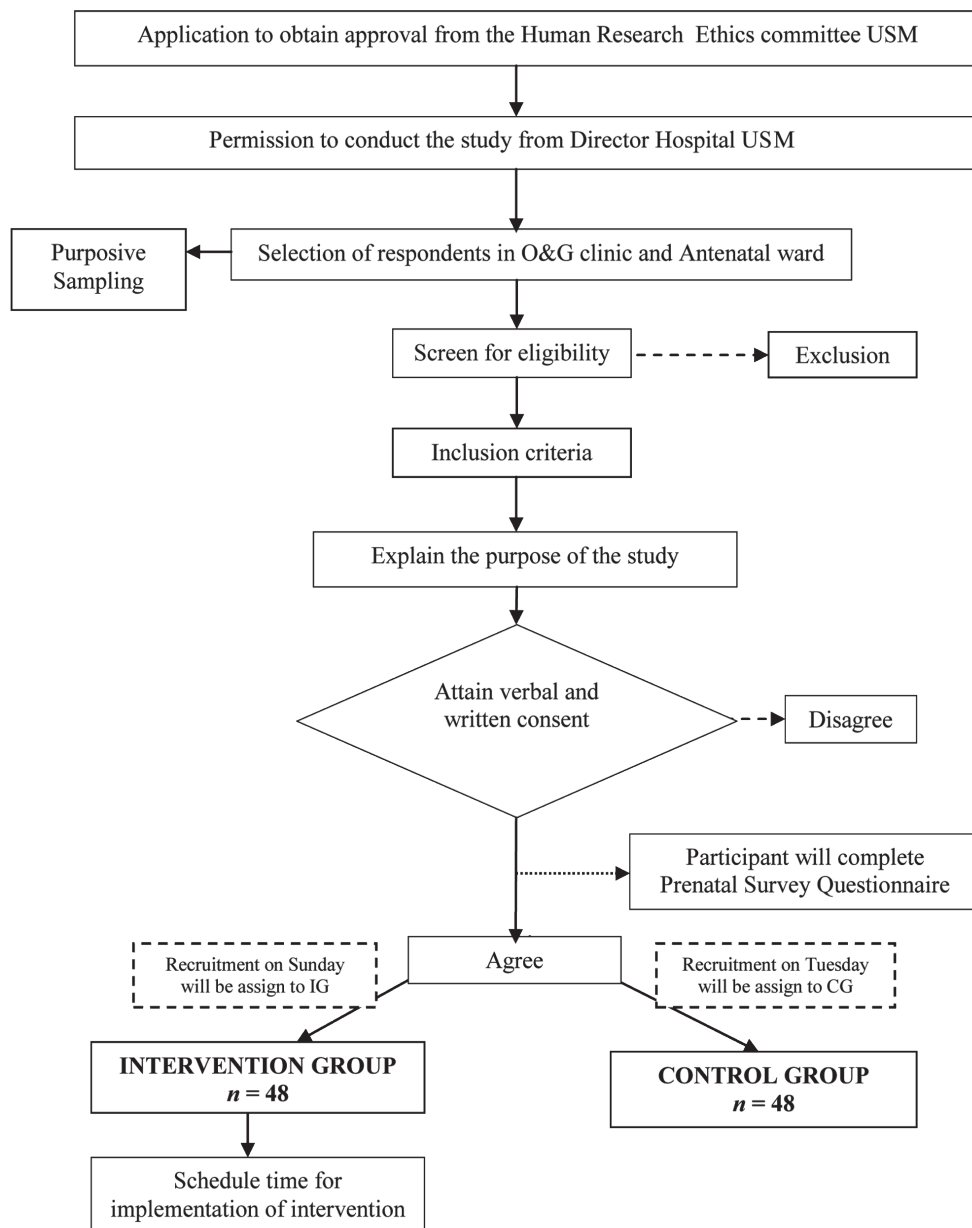


Figure 1. Summary of data collection

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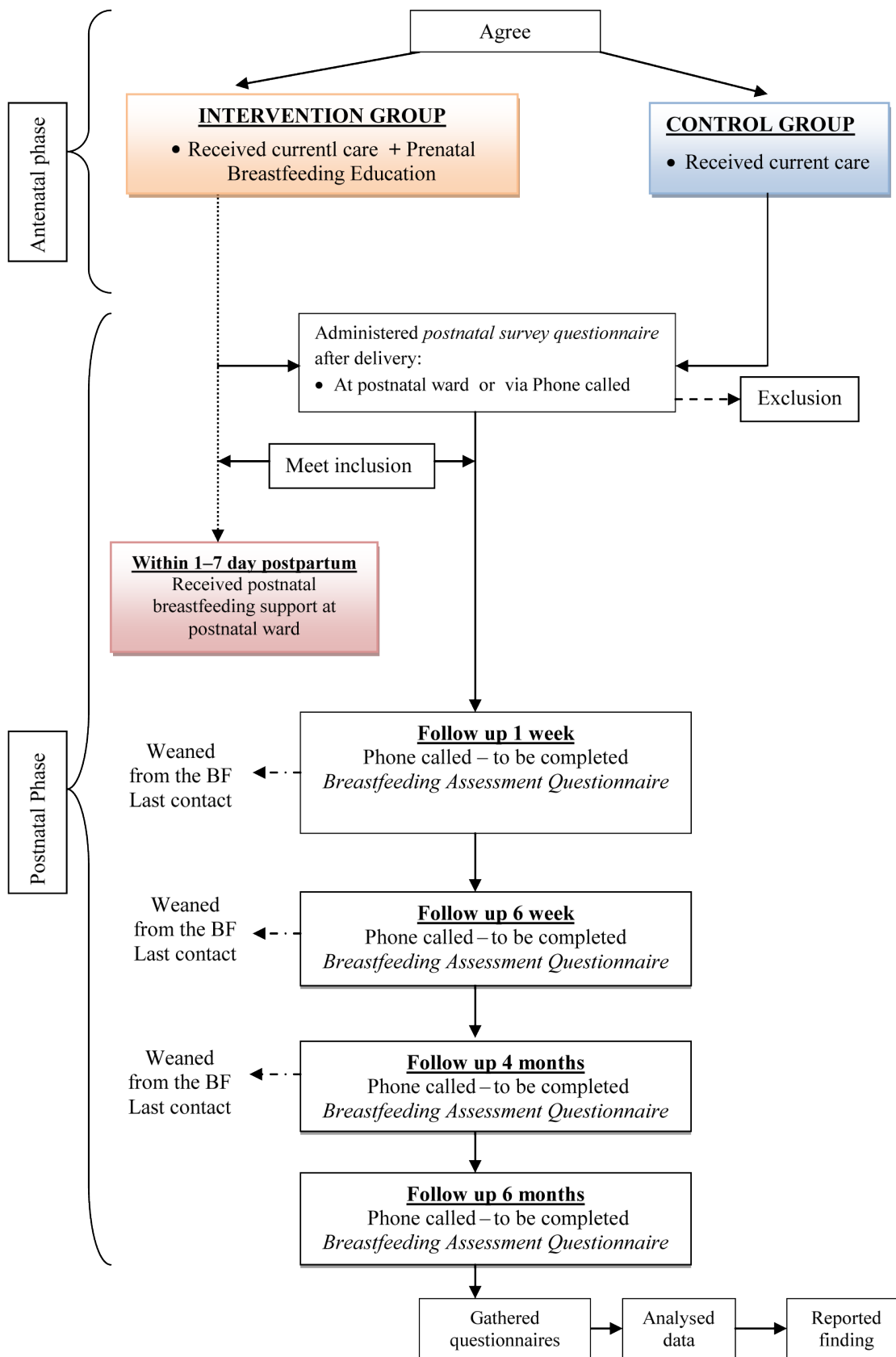


Figure 1. (Continued)

continuous breastfeeding as a dichotomous outcome was derived from the exclusivity outcome which was compressed into two levels and a chi-square test was used. Then, for the second analysis, a one-way ANCOVA was conducted to determine a statistically significant difference between IG and CG on the breastfeeding duration controlling for age and occupation.

Loss to Follow-Up

A total of 96 breastfeeding mothers participated in this study; 48 in IG and 48 in CG. However, only 86 of the mothers completed the study until the last follow-up session. As demonstrated in Figure 2, the initial response rate for this study was 96.9% on the first and sixth week and nine mothers were excluded

because they were unable to be contacted by phone and one dropped out at early postpartum, making a total of ten. The overall dropout rate was 10.4% and remained below the recommended rate of 20.0% used in a sample size determination.

Results

Participant Demographic Characteristics

For both groups, the mothers had a mean (SD) age of 25.68 years (4.06), ranging between 18 to 39 years. Of the 96 mothers, 95 (99.0%) were Malays while only one (1%) was from the other races, which was Siamese. The demographic characteristics of participants in two groups are listed in Table 2.

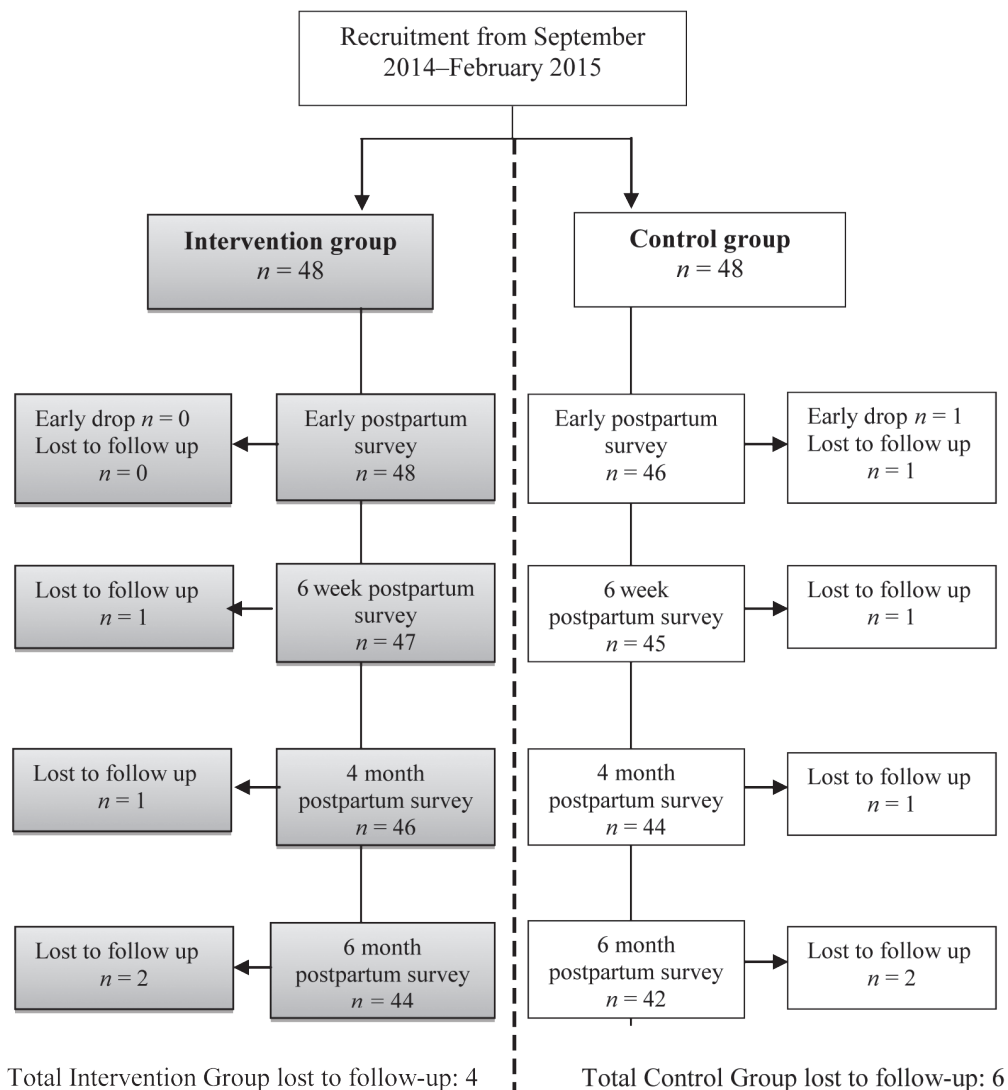


Figure 2. Number of mothers from study entry to completion

Table 2. Demographic characteristics of the intervention and control group

Variable	Values	Total Group N = 96 n (%)	Intervention N = 48 n (%)	Control N = 48 n (%)
Maternal age	Mean (SD)	25.68 (4.06)	26.73 (3.78)	24.59 (4.10)
Race	Malay	95 (99.0)	48 (100)	47 (97.9)
	Siamese	1 (1.0)	0 (0.0)	1 (2.1)
Household income	Mean (SD)	2695.83 (1799.22)	2550.00 (1627.65)	2754.35 (1943.16)
Education	Primary school	2 (2.1)	1 (2.1)	1 (2.1)
	Secondary School	49 (51.0)	22 (45.8)	27 (56.2)
	Higher Education	45 (46.9)	25 (52.1)	20 (41.7)
Occupation	Working	53 (55.2)	27 (56.2)	26 (54.2)
	Not Working	43 (44.8)	21 (43.8)	22 (45.8)
Types of delivery	Spontaneous Vaginal Delivery	65 (69.1)	36 (75.0)	29 (63.0)
	Caesarean Section	29 (30.9)	12 (25.0)	17 (37.0)
Baby's sex	Boy	37 (39.4)	16 (33.3)	21 (54.3)
	Girl	57 (60.6)	32 (66.7)	25 (45.7)
Baby's birth weight	Mean (SD)	3.10 (0.43)	3.10 (0.44)	3.10 (0.42)

Breastfeeding Exclusivity Outcome

Table 3 presents the proportion of infant feeding category levels for all mothers on the first week until the sixth months of postpartum. A greater percentage of mothers in IG practised full breastfeeding in all follow-up weeks compared to CG.

The infant feeding category levels were compressed into two and the second analysis largely confirmed the outcome of the initial analysis. The analyses of full breastfeeding at week one and six and month four and six for both groups are shown in Table 4.

Chi-square analysis was used to compare between full versus non-full breastfeeding between the groups at four-time points. At the first and sixth weeks and sixth months of postpartum, the results showed a higher proportion of mothers in IG practising full breastfeeding, compared to the CG. However, the test did not show any significant effect of the intervention at any of the three time-points, with *P*-values of 0.089, 0.292, and 0.236 at the first and sixth weeks and sixth months of postpartum, respectively, except for the fourth month of postpartum. A chi-square test for independence indicated a significant association between the groups and full breastfeeding practices at the fourth month of postpartum, $X^2 = 5.671$, $P = 0.017$.

Breastfeeding Duration

Table 5 demonstrates the continuation of breastfeeding. Overall, the results showed that the continuation of breastfeeding for both groups gradually dropped for each time of the follow-up.

At the sixth week, there was a significant drop in continuing breastfeeding in both groups; 95.7% for IG and 80.0% for CG ($X^2 = 5.414$, $P = 0.020$). During the fourth month of follow-up, the dropped rate of breastfeeding continuation in CG was higher than IG. Thus, the rate of decline was significantly different between the groups ($X^2 = 7.515$, $P = 0.006$). The results showed that it was significant in two follow-up sessions and not in the other two. However, more mothers in IG were breastfeeding at all four follow-up periods.

There was a significant effect of breastfeeding intervention on the breastfeeding duration after controlling age and occupation, $F(3, 82) = 6.7$, $P = 0.011$. A Turkey post-hoc test revealed the breastfeeding duration in IG significantly higher (20.80 ± 6.31) compared to CG (16.98 ± 8.97). An analysis of the effects of the intervention on breastfeeding duration is summarised in Table 6.

Table 3. Exclusivity of breastfeeding at 1st and 6th weeks and 4th and 6th months of postpartum in the intervention and control groups

Infant Feeding Category	Intervention <i>n</i> (%)	Control <i>n</i> (%)	Total <i>n</i> (%)
First week:	<i>n</i> = 48	<i>n</i> = 46	<i>n</i> = 94
Bottle	3 (6.2)	5 (10.9)	8 (8.5)
Partial	2 (4.2)	6 (13.0)	8 (8.5)
High	6 (12.5)	7 (15.2)	13 (13.8)
Full	37 (77.1)	28 (60.9)	65 (69.1)
Sixth week:	<i>n</i> = 47	<i>n</i> = 45	<i>n</i> = 92
Bottle	2 (4.3)	9 (20.0)	11 (12.0)
Partial	7 (14.9)	7 (15.6)	14 (15.2)
High	13 (27.7)	10 (22.2)	23 (25.0)
Full	25 (53.2)	19 (42.2)	44 (47.8)
Fourth month:	<i>n</i> = 46	<i>n</i> = 44	<i>n</i> = 90
Bottle	4 (8.7)	14 (31.8)	18 (20.0)
Partial	7 (15.2)	7 (15.9)	14 (15.6)
High	10 (21.7)	10 (22.7)	20 (22.2)
Full	25 (54.3)	13 (29.5)	38 (42.2)
Sixth month	<i>n</i> = 44	<i>n</i> = 42	<i>n</i> = 86
Bottle	13 (29.5)	18 (42.9)	31 (36.0)
Partial	14 (31.8)	15 (35.7)	29 (33.7)
High	5 (11.4)	2 (4.8)	7 (8.1)
Full	12 (27.3)	7 (16.7)	19 (22.1)

Note: Data reported as % (number/*n*). Group sizes vary due to missing responses. Percentages do not consistently add to 100 due to rounding.

Table 4. Chi-square comparison of infant feeding outcomes between groups

Group	Time	Infant Feeding Outcomes		<i>X</i> ²	<i>P</i>
		Full BF <i>n</i> (%)	Non-Fully BF <i>n</i> (%)		
Intervention (48)	Week 1	37 (77.1)	11 (22.9)	2.895	0.089
Control (46)		28 (60.9)	18 (39.1)		
Total (94)		66 (70.2)	28 (29.8)		
Intervention (47)	Week 6	25 (53.2)	22 (46.8)	1.109	0.292
Control (45)		19 (42.2)	26 (57.8)		
Total (92)		44 (47.8)	48 (52.2)		
Intervention (46)	Month 4	25 (54.3)	21 (45.7)	5.671	0.017*
Control (44)		13 (29.5)	31 (70.5)		
Total (90)		38 (42.2)	52 (57.8)		
Intervention (44)	Month 6	12 (27.3)	32 (72.7)	1.404	0.236
Control (42)		7 (16.7)	35 (83.3)		
Total (86)		19 (22.1)	67 (77.9)		

Note. *df* = 1, BF = Breastfeeding

**P* < 0.05

Table 5. Chi-square comparison of continuation breastfeeding outcomes between groups

Group	Time	Continuation of Breastfeeding Outcomes		X^2	P
		Continuing n (%)	Non-continuing n (%)		
Intervention (48)	Week 1	46 (95.8)	2 (4.2)	1.531	0.263 ^a
Control (46)		41 (89.1)	5 (10.9)		
Total (94)		87 (92.6)	7 (7.4)		
Intervention (47)	Week 6	45 (95.7)	2 (4.3)	5.414	0.020*
Control (45)		36 (80.0)	9 (20.0)		
Total (92)		81 (88.0)	11 (12.0)		
Intervention (46)	Month 4	42 (91.3)	4 (8.7)	7.515	0.006*
Control (44)		30 (68.2)	14 (31.8)		
Total (90)		72 (80.0)	18 (20.0)		
Intervention (44)	Month 6	31 (70.5)	13 (29.5)	1.652	0.199
Control (42)		24 (57.1)	18 (42.9)		
Total (86)		55 (64.0)	31 (36.0)		

Note: $df=1$ ^aThe P -value was derived from Fisher's test* $P < 0.05$ **Table 6.** Effect of intervention on breastfeeding duration (week)

Variable	Mean \pm SD	P -value*	Adj. mean ^a (95% CI)	F (df)	P -value ^b
Intervention	20.80 \pm 6.31	0.025	21.28 (19.03, 23.54)	6.7 (3, 82)	0.011
Control	16.98 \pm 8.97		16.98 (14.64, 19.32)		

*Independent t -test; ^aAdjusted mean using ANCOVA after controlling for age and occupation for this variable; ^bANCOVA

Effect of Intervention on Breastfeeding Discontinuation

The duration of breastfeeding was analysed by Kaplan Meier survival analysis for the main study variable. More mothers were still breastfeeding at 24 weeks in IG (70.5%) than CG (57.1%) and the mean duration was (19.06 weeks) as shown in Figure 3.

The mean discontinuation time was 19.06 weeks (CI : 17.37, 20.75). Mothers who received the intervention had less discontinued breastfeeding (13/44) compared to those who did not receive the intervention (18/42). Mothers who received intervention has a longer mean duration (21.05 weeks) compared to those who did not receive the intervention (16.98 weeks). However, there was no significant difference of mean duration time of mothers who received the intervention (mean: 21.05 weeks, 95% CI : 19.162, 22.938) compared to those who did not (mean:

16.98 weeks, 95% CI : 14.299, 19.663) (P -value = 0.122). Table 7 summarises the findings of the Kaplan Meier analysis.

Discussion

The Effects of Intervention on Breastfeeding Exclusivity

The impact of the prenatal breastfeeding education and postnatal support became much pronounced at the fourth month of postpartum, resulting in significant differences between the groups on exclusive breastfeeding rates. The current study showed 77.1% and 53.2% of mothers in IG exclusively breastfed at the first and sixth weeks of postpartum versus 60.9% and 42.2% in CG, respectively. The low rates of exclusive breastfeeding in the early postpartum period were observed in Peninsular Malaysia. The previous study by Tan (11) reported only 63.3% of mothers exclusively breastfed at the

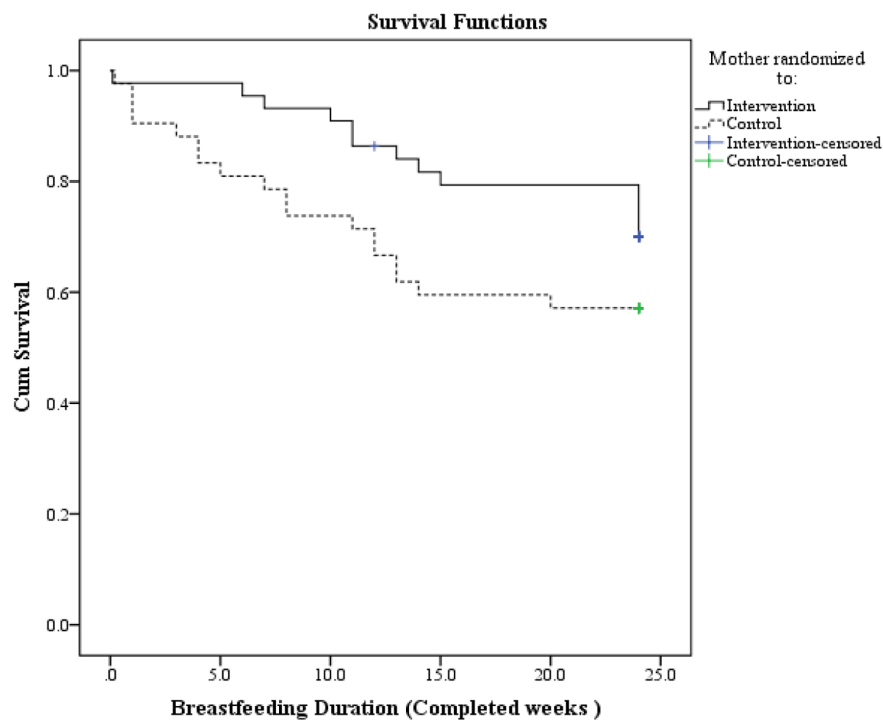


Figure 3. Survival analysis of the discontinuation of breastfeeding for the intervention group versus control group

Table 7. Differences of mean duration breastfeeding discontinuation of mothers

Variables	n	discontinue (%)	Mean (95% CI) (weeks)	Log Rank ^a (df)	P-value
Group					
Intervention	44	13 (29.5)	21.05 (19.162, 22.938)	2.393 (1)	0.122
Control	42	18 (42.9)	16.98 (14.299, 19.663)		

^aKaplan Meier analysis

fourth week of postpartum. Moreover, the rates of mothers practising exclusive breastfeeding at the fourth weeks of postpartum closely matched the rates reported in Kelantan (54.4%) (6). In addition, the rates of exclusive breastfeeding among the mothers from IG were parallel to other reported studies, whereas the CG rates were slightly lower (9–11).

The higher rates of exclusive breastfeeding in the present study compared to those studies were probably due to ineffective telephone lactation counselling at the fourth and sixth months of postpartum in increasing the rate of exclusive breastfeeding (12). What was interesting in this result was that the rates of exclusive breastfeeding were higher than those reported in the Malaysian Third National Health and Morbidity Survey, 2006 (12) (14.5%) but less

than those reported in the Annual Report by the Ministry of Health Malaysia in 2011 (13) (23.3%).

The Effects of Intervention on Breastfeeding Duration

The intervention seemed to have a positive effect on breastfeeding duration. At the sixth month of postpartum, the difference in breastfeeding duration between the groups was less pronounced, where approximately 13.4% more mothers in IG (70.5%) continued to breastfeed compared to CG (57.1%). The fact that the proportion of mothers who continued to breastfeed was higher in IG suggested that the educational intervention was useful yet insufficient to create a statistically significant difference between the two groups. The high rate of breastfeeding on the first week can be

explained by the fact that at the first week of postpartum, the majority of mothers stayed at home after delivery and had not returned to work. Returning to work was one of the factors that may influence women's decision to discontinue breastfeeding (14).

Significant differences in the rate of decline for breastfeeding were identified between the groups at the sixth week and fourth month of postpartum. In comparison, the mothers from the CG experienced a more drastic decline, a significantly greater number of mothers discontinued breastfeeding on the sixth week was 9 (20.0%), followed by a rapid decline in the subsequent fourth month, which was 14 (31.8%). This trend suggested that the prenatal breastfeeding education and postnatal support intervention may have increased breastfeeding duration at the sixth weeks and fourth month of postpartum among the mothers of IG. However, because the discontinuation rate increased after each follow-up week in both groups, the finding suggested that a longer and continuous intervention may be essential to sustain breastfeeding duration among mothers until two years of age of the infants.

Practical Implications for Nursing

It is important to apply the current research findings to establish new and more effective interventions to study these issues. This intervention programme might be valuable to people who are supporting mothers who want to breastfeed such as nurses and lactation consultants. Nurses who work in primary care, antenatal and postnatal wards, labour room, and paediatric and obstetrics and gynaecology units have the opportunity to educate mothers about the importance and benefits of breastfeeding and provide the necessary information so the mothers can make an informed decision.

Study Strengths and Limitations

One of the strengths of this study is the breastfeeding education implemented during the prenatal period and additional support given after the birth within one week of postpartum. We knew that the combination of prenatal and postnatal education was more effective compared to the antenatal education or postnatal support alone. Prenatal education in the present study was an effective programme or important strategy because it applied the four elements

of self-efficacy based on the breastfeeding self-efficacy theory. There were several limitations in this study. Firstly, this study used a non-randomised design in recruitment, thus limiting the generalisability of the results to different care settings. Due to time, financial, and human resource constraints, the intervention was conducted only in one hospital (Hospital USM). Therefore, the effectiveness of the intervention cannot be generalised across other hospitals and may not represent the actual practices in the other states in Malaysia. Secondly, a limitation of the study was that prenatal breastfeeding education and postnatal breastfeeding support were given for one time only. It might be reasonable to provide continuous prenatal education and postnatal support within six months of the postpartum period for several times. Lastly, the current research was not specifically designed to evaluate factors related to breastfeeding exclusivity and duration, thus unable to analyse these variables. Because of the quasi-experimental nature of this study, no definite conclusion regarding the factors affecting breastfeeding duration can be drawn at this moment. Future cross-sectional studies are needed to determine factors influencing breastfeeding exclusivity and duration.

Conclusions

This study attempted to determine the effects of the prenatal breastfeeding education and postnatal breastfeeding support with the aim to increase the rates of breastfeeding and exclusivity among primiparous mothers. The evidence from this study suggested that the breastfeeding intervention programme was an effective approach to increase breastfeeding exclusivity and prolong the duration of breastfeeding among primiparous mothers. It was significant for health care providers to improve and strengthen the breastfeeding programmes to help promote, educate, and support mothers to breastfeed. A point to be noted is that both the intervention and control groups attended the antenatal classes and some breastfeeding lecture or talk by the nursing personnel because Hospital USM is a baby friendly hospital and breastfeeding is encouraged and it should be considered that the antenatal classes might have some effects on these mothers pertaining to breastfeeding exclusively.

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Authors' Contributions

Conception and design: RF
Analysis and interpretation of the data: RF
Drafting of the article: RF
Critical revision of the article for important intellectual content: RF, CRM, RI, MSO
Final approval of the article: RF, CRM, RI, MSO
Provision of study materials or patients: RF
Statistical expertise: RF
Collection and assembly of data: RF

Correspondence

Rosuzeita Fauzi
MSc (Nursing) Universiti Sains Malaysia
Level 13, FSK 6 Building,
Centre for Nursing Studies,
Faculty of Health Sciences,
UiTM Selangor, Puncak Alam Campus,
42300 Bandar Puncak Alam,
Selangor, Malaysia.
Tel: +603 3258 4477
E-mail: rosuzeita@uitm.edu.my/rosuzei@gmail.com

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