International Journal of Engineering & Technology, 7 (4.38) (2018) 1001-1005

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Effect of Breastfeeding Education on Mother's Knowledge and Infant Weight Gain

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Abstract

Breastfeeding education should be delivered by a person who is qualified and expertise in lactation management. This study is conducted to evaluate the effects of breastfeeding education on mothers' knowledge and infants' weight gain. The mothers received individual and group counselling education interventions. The intervention resulted in a significant difference in the level of knowledge regarding post breastfeeding education between groups ($p < 0.001$). However, the infants' weight patterns showed an increase in total of 489 grams for the control group and 356 grams for the intervention group by week four. Support from nurses is vital for the successful assistance of mothers in breastfeeding to empower them and boost their confidence.

Keywords: *Breastfeeding education, knowledge, weight gain, Neonatal Intensive care*

1. Introduction

Breastfeeding education usually occurs during the prenatal and intrapartum periods. It should be taught by someone with expertise or training in lactation management. It may be offered in a hospital or clinical setting, as well as in libraries, community centres, churches, schools, and work sites. Education primarily includes information and resources1. However, first-time mothers report that they find books and written information helpful while experienced women often rely on their experience and communication with a healthcare provider2. Although the clients are usually pregnant or breastfeeding women, fathers and others who support the breastfeeding mother may also be involved in the sessions. The goals of breastfeeding education are to increase mothers' knowledge and skills, help them view breastfeeding as ordinary, and help them develop positive attitudes toward breastfeeding3.

. The government of Malaysia and, in particular, the Ministry of Health has already done an excellent job in promoting breastfeeding. However, their shortcomings are mainly due to the lack of staff to educate and counsel individual mothers on breastfeeding and a lack of continuity of this process at the community and clinic level4. As such, there should be more grassroots-level peer counsellors to help individual mothers. The current peer counselling training is mainly community-based and, as such, mothers are not getting enough assistance when faced with breastfeeding problems. There are some recommendations by the reviewer on breastfeeding such as there should be a national monitoring system by an independent body for all media online and offline with regards to breastfeeding information and counselling. If there are wrong messages or information, then they can advise the media to correct the article or information5. The use of printed breastfeeding information alone (such as pamphlets, books, and posters) did not affect breastfeeding initiation6.

Previous study reported that 69% of breastfeeding initiation rate among mothers of full-term infants compared to 50% among mothers of preterm infants at hospital discharge6. The overall breastfeeding initiation and continuation rates were higher in non-NICU infants of all gestational ages9. However, a positive effect of NICU admission on breastfeeding among preterm infants including the late preterm10. That being said, this may be partially due to exposure to positive messages and educational interventions promoting breastfeeding as well as a presence of lactation consultant services. Therefore, ensuring that parents with infants admitted to the NICU are provided with adequate education regarding breastfeeding is one of the most important steps for successful breastfeeding 11.

Breast milk is the optimal form of nutrition for infants, especially sick, preterm, or otherwise compromised infants11. However, it is a challenge for parents with infants admitted to the neonatal intensive care unit (NICU). Mothers at NICU invariably go through a terrible experience mixed with feelings of helplessness, stress and worry12. Parents are unsure of how to handle their sick infants and provide enough breast milk during hospitalization4. Therefore, they will need effective guidance and beneficial support to successfully undergo these experiences13. Preparation of interventions to support and involve parents in the care of their sick infant can improve confidence and reduce stress for both parents and the baby6.

A mother needs help to ensure that she can position and attach her baby at her breast, guidance on how to interpret her baby's behaviour and respond to it, and education about demand (or unrestricted) breastfeeding as well as exclusive breastfeeding14. If a mother has difficulties, she needs skilled help to overcome them. Thus, mothers need someone who can give her support and confidence. The parents' perspectives were found to be that successful breast milk supply in NICU depends on coherent and accurate knowledge about its techniques and benefits, reinforcement of mothers' motivation and alignment between NICU's routines and parents' needs15. Furthermore, for breastfeeding education to be implemented at scale, different modes of delivery should be con-

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sidered, including one on one, group and peer-led sessions in both ward setting and community-based setting2.
Mothers are consistently given information about the benefits of breastfeeding, it might influence those who have not already made a decision or those whose decision is not final but increasing social support may be more effective in enabling women to decide to breastfeed and to carry out their decision10. However, it may be necessary to use additional strategies, for example including the family, mother, partner and close friends or peers together in antenatal education programs. The guidance consisted are required on practical advice from a hospital nurse trained in breastfeeding management, a breastfeeding brochure, and wall posters illustrating attachment techniques as well as messages such as 'breastfeed frequently' or on demand during the hospital stay16. In an effort to increase breastfeeding rate and awareness among NICU mothers, this study plan attempted to implement different breastfeeding education strategies. For that reason, this study was to carry out to evaluate the effects of breastfeeding education on mothers' knowledge and infants' weight gain in the Neonatal Intensive Care Unit (NICU).

2. Methodology

2.1. Study design

A quasi -experimental study was performed on breastfeeding education strategies involving individual versus group counselling session using pre and post structured knowledge questionnaires to evaluate the effects of breastfeeding education on parents' knowledge before and after receiving an intervention on the control group (n=30) and intervention group (n=25). Respondents were selected using purposive sampling method. To minimize bias and contamination, the chosen respondents are conducted in a separated month which is in the first month for the control group and second month for the intervention group. Mothers' infants who are eligible and consented were approached with the intervention and routine care according to the framework of data collection.

2.2. Study setting

This study was done in the Neonatal Intensive Care Unit in the teaching hospital in Kuala Lumpur. The samples of this study were mothers of admitted to the NICU which is in this unit had 34 beds and manage under Pediatric and Neonatologist, nurses and collaboration with others healthcare provider like dietitian and speech therapy.

2.3. Sample population and size

The study population consisted of a mother with infants between 32 weeks to term gestation with birth weight >2.2 kg in the NICU. The sample size was calculated using sample calculation for testing a hypothesis (clinical trials or clinical intervention studies): Effect size was used to calculate the sample size and Al-Therapy Statistics formula to determine the purposive sample size. The expected effect size was 50% with study power of 80%. The number of samples calculated was estimated 68 (34 samples per arm).Bell et. al. (2013) reported and attrition rate of 20% or more in 18% of the trials from a review of 71 randomized controlled trials in four medical journals. 20-25% or less was generally considered as an acceptable overall dropout rate for an intervention study. Inclusion criteria for the samples are the mother of infants with gestational age 32 weeks to term and birth weight >2,2 kg, mothers of an infant are expected hopitalisation duration one week or more and mother who decided to breastfeed. The exclusion criteria for this study are the mother of the infant with congenital abnormalities, necessitating surgery, the mother with major medical complications and medical illness excluded from this study. Time allocated for data collection for these study only three months. Respondents whom are eligible and consented within the time frame, managed to collect for the control group (n=30) and intervention group (n=25). Hence, the total dropout rate for this study is 8.8%.

2.4. Validity and Reliability of the Instrument

The questionnaire used in this study was developed17 , and it is available in both English and Malay languages. These available tools are valid and reliable for assessing the knowledge of breastfeeding with Cronbach's alpha of above 0.7 for the 47 items of knowledge components on breastfeeding. The questionnaire has 47 items, covering the following scopes of knowledge on breastfeeding; general knowledge, colostrum, advantages to mothers and babies, effective feeding method, duration of feeding, complementary feeding, problems with breastfeeding. Each categorical responses consisted of yes, no, or do not know. A correct response will be scored as '1', whereas wrong or do not know responses will be scored as '0'. Total knowledge score ranges from 0-47, with higher scores indicating more knowledge. Respondents whose scores are less than 50% (i.e., <24) was considered as "unsatisfactory", 50% to <75% (i.e., 24-35) was considered "good", while knowledge scores of 75% or more (i.e., 35-47) was considered "excellent". The questionnaires were divided into 10 sections: Advantages to baby (6 items), Advantages to mother (6 items), Colostrum (4 items), Effective breastfeeding (3 items), Breast milk expression (8 items), Duration of feeding (4 items), Complementary feeding (2 items), Problems with breastfeeding (5 items), Breastfeeding engorgement (2 items), and Practical aspects (7 items).

2.5. Study phases

This programme was designed in order to improve the quality of care and to promote exclusive breastfeeding to mothers by assessing improvements of breastfeeding educational strategies. A quantitative approach has been chosen as the best mechanism to gather relevant information and data regarding the knowledge level. This research used a pre and post-experimental design. Mothers' of infants admitted to NICU were selected using purposive sampling method guided by the stated inclusion and exclusion criteria. Written consent was taken within week 1 of admission to the NICU. The selected sample was purposively selected and organised into control and intervention group. To minimise bias, the researcher started with the control group in the first month and then continued with the intervention group in the second month. The third month was allocated for follow up and recording of the infants' weight. Mothers were given an appointment date for follow up of infants' weight at weeks 2, 3 and 4.

2.6. Intervention programme

Breastfeeding education programme are routinely given for the control group. They receive routine care individual sessions (one to one) which includes a breastfeeding pamphlet and any queries are attended by the healthcare staff. However, for the intervention group, they are required to attend one breastfeeding counselling group session (each session 30-45 minutes) conducted by a breastfeeding counsellor. Breastfeeding flip cards were also used during the session as a teaching guideline. After completing the breastfeeding education for both groups, the recording of the infants' weight on day 1, week 2, 3 and 4 was carried out. In this case, the mothers received appointment date to come to NICU to weigh the baby.

2.7. Ethical approval

The researcher passed the ethics meeting, and approval was given to pursue the research. This study started after receiving approval

from the Ethics and Medical Research Committee, Universiti Teknologi MARA (UiTM): 600-IRMI(5/1/16) REC/171/16.

2.8. Statistical analysis

All data was coded into Statistical Package for the Social Sciences (SPSS) version 23 for analysis. Frequency distribution and means were analysed to describe the demographic data in the intervention and control groups. In order to analyse the differences in mean of knowledge about breastfeeding and mean score of weight gain for pre and post-test intervention between the two groups, an independent 't' test was computed with a statistically significant level of $p<0.05$.

3. Result and discussion

3.1. Demographic data

The study sample consisted of 55 mothers whose infants' were admitted to the Neonatal Intensive Care Unit (NICU) who were divided into a control group with 30 participants and an intervention group with 25 participants. The characteristics consisted of the mother and the baby. The average mean age for mothers in the control group was 31.97 years old (SD 5.85) and 31.3 (SD 3.71) for the intervention group. All of the participants for both groups were married 30 (100%) in control group and 25 (100%). Most of the participants were Muslim which is 30 (100%) in the control group and 22 (88%) in the intervention group. However, the intervention group had 3 (12%) who are Buddhists. The control group had 8 (26.7%) housewives and 22 (73.3%) working mothers. The intervention group had similar results with 10 (40%) housewives and 15 (60%) working mothers. For educational level, the control group had 2 (6.7%) with secondary education, 18 (60%) with a diploma and 10 (33.3%) with a degree and above. For the intervention group, 2 (8%) had secondary education, 11 (44%) with a diploma and 12 (48%) had a degree and above. The participants in the control group with 1-2 children was 17 (56.7%), with 3-4 children was 12 (40%) and those with >5 children was 1 (3.3%). For the intervention group, the participants with 1-2 children was 17 (68%), 3- 4 children was 7 (28%) and >5 children was 1 (4%). In the control group, 10 (3.3%) participants were primigravida while 2 (8%) were multigravida and the intervention group had 20 (66.7%) primigravida and 23 (92%) multigravida. The difference in mean of baby gestational age for both groups is not much different. In control group mean 38.13 (SD 2.047) while the intervention group had a mean of 37.6 (SD 2.255).

3.2. Correlation between parents' knowledge level on breastfeeding post-education with infants' weight gain.

Table 1 portrays the results of the Pearson correlation test on the correlation between knowledge level of breastfeeding post-education with infants' weight. It shows that there is no significant relationship between the level of knowledge and weight pattern, $r = .329$, $n = 30$, $p = .076$ in control group and $r = .134$, $n = 25$, $p = .523$ in intervention group.

Table 1: Correlation between mother's knowledge on breastfeeding with infant's weight gain

				r	Sig (2 tailed)
Control (n=30)	group	Level knowledge Weight	of	.329	.076
Intervention (n=25)	group	Level knowledge Weight	of	.134	.523

p<0.05

3.3. Effect of infants' weekly weight gain post breast-feeding education.

Table 2: shows an average of baby weight gain post breastfeeding education.The control group had a mean baby birth weight on day 1 of 2.88 (SD .36) and intervention group had a mean of 2.97 (SD .31). The mean baby weight in week 2 for the control group was 2.94 (SD .38) and the intervention group had a mean of 3.05 (SD .31). Baby weight in week 3 for the control group had a mean of 3.13 (SD .39) and the intervention group had a mean of 3.18 (SD .29). The mean baby weight in week 4 was 3.37 (SD .39) for the control group and 3.33 (SD .27) for the intervention group.

	Mean	SD	r	Mean	SD	r
Infant birth weight – day 1	2.88	.36		2.97		
Infant birth weight – week 2	2.94	.38	-2.196	3.05	.31	-1.963
Infant birth weight – week 3	3.13	.39	-8.291	3.18	.29	-8.416
Infant birth weight – week 4	3.37	.39	-10.148	3.33	.27	-8.237

Figure 1 shows the infants' weekly weight pattern from birth weight to week 4. The total weight pattern on week four for the control group 489 grams while the intervention group's weight pattern on week four was 356 grams.

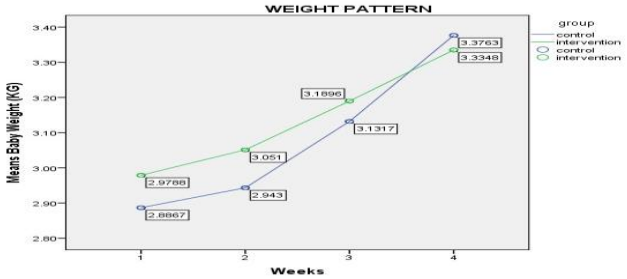


Figure 1: Infant Weight gain pattern followed by week

3.4. Feeding Outcome on Discharge And 28 Days Post Education

Table 3: shows that all participants in the control group 30 (100%) and intervention group 25 (100%) are successfully breastfeeding at discharge and 28 days post education.

Variable	Control		Intervention	
	n	%	n	%
Feeding outcome (practice) on discharge and 28 days post education	30	100	25	100

4. Discussion

The correlation between mothers' level knowledge on breastfeeding with weight pattern at one month was not significant. This shows that knowledge does not influence the weight gain of infants for either groups, control or intervention. This is probably because this study only looked at the correlation between knowledge and infants' weight gain without monitoring the frequency of feeding and frequency of breast milk expression. Practical aspect should be emphasized so that help providers can enhance the mothers' empowerment and increase their confidence level while handling their sick neonate during hospitalisation and can next provide optimal care. This is probably due to a different setting and the small sample size makes finding diversity in the

population more difficult and less significant. The goals of breastfeeding education strategies are to increase mothers' knowledge and skills, help them view breastfeeding as normal and help them develop positive attitudes toward breastfeeding3. The irrespective of breastfeeding education strategies, the infant's weight gain should refer to breastfeeding demand intake and medical condition18. Mothers should be supported in guiding and observing their infants' sign of feeding cues and behavioural state1.

Effect of infant weekly weight gain post education breastfeeding showed little difference between the control and intervention groups with a 133-gram difference. Despite this, control group had higher infant weight gain compared to the intervention group. Thus, a reason that may have influenced this result is because a feeding practice on discharge and 28 days follow up are 100% and the mothers still continued breastfeeding. However, a study was report that showed mixed feeding occured in the intervention group who received individual breastfeeding counselling sessions16. These results showed that learning already takes place during this period. Therefore, 'Breastfeeding guidance' is not always clearly described but consists of different mixtures of practical help, educational messages about technique and feeding pattern, and psychological support. Inaccurate and inconsistent assistance from health staff has been recognized as a major obstacle to breastfeeding16. This support that the planning of infant discharge from NICU of infant should occur in collaboration with the family and peer counsellor support group and include a plan for transition to full oral feeding, promoting, protecting breastfeeding and breast milk feeding19. Furthermore, peer counsellors should also plan for a follow up soon after discharge, individualized according to the infant's condition and assist mothers with breastfeeding problems. Peer support after discharge reduces the risk of no breastfeeding, increases the amount of breast milk provided by mothers, and contributes to longer duration of breastfeeding18. It should occur in collaboration with the family and peer counsellor support group and include a plan for transition to full oral feeding, promoting, protecting breastfeeding and breast milk feeding18.

5. Conclusion

In conclusion, this study supports that an environment of care delivered is a strong predictor of choice and success in breastfeeding education. Also, the NICU should also emphasise the importance of nurses and lactation counselor in the decision to initiate and continue breastfeeding. Mothers in NICU rely on nurses to provide accurate, complete and consistent information about breastfeeding their high-risk infant. Many of the mothers of term and preterm infants have not had an opportunity to prepare for motherhood before the birth of their baby. Some may have planned on taking a breastfeeding or parenting class, but the early arrival dampened these plans. Therefore, future studies should test the efficacy of an intervention to support breastfeeding individualized care plan (ICP) practices in the NICU. Hence, the intervention centred on nurses change through an educational initiative, modifications to the individualized care plan (ICP) with a breastfeeding protocol, and educational materials for mothers with infants in the NICU. It was hypothesized that the intervention plan would foster change in nurses which would then enable positive changes in effective breastfeeding practices in the NICU. The method of study suggested would be an observational study. Hence, health professionals could closely observe the skill breastfeeding and breast milk pattern among mothers in NICU, not only for mothers of infant late preterm and term but mothers of preterm infants. Also, the data collection period should be six months to enable data collection from a large enough sample size.

Acknowledgment

This work was supported by Grant Lestari funding 600-IRMI/MyRA5/3/Lestari (0122/2016) funding by Universiti Teknologi Mara, UiTM, and Special thanks to the participants were involved in the intervention programmed and Nursing for Centre, Faculty Health Sciences.

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