Original Article

Effect of telephone follow-up on postdelivery breastfeeding and maternal attachment

Mohsen Adib-Hajbaghery[1], Tayebeh Hashemi-Demneh[2]

[1]Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, [2]Department of Nursing, Alborz Hospital of Karaj, Karaj, Iran

Abstract

Context: Encouraging breastfeeding is a public health priority. However, no study is available from Iran on the effect of telephone follow-up on postpartum maternal attachment to the newborn.

Aims: To assess the impact of postpartum telephone follow-up on breastfeeding and maternal attachment.

Setting and Design: A clinical trial was conducted on 120 mothers who had a delivery at Alborz Hospital of Karaj during the spring of 2014.

Material and Methods: Mothers were randomly assigned into three groups of 40. The groups one and three received breastfeeding training (BFT) and the groups one and two received telephone follow-up. Data were collected using a questionnaire. All groups had a pretest and a posttest on their knowledge, attitude, and performance toward breastfeeding. Mothers' attachment to their newborn was assessed at the end of the study.

Statistical Analysis Used: Analysis of variance, Tukey, and Paired t tests were used for data analysis.

Results: The BFT plus telephone follow-up could increase the mothers' scores in breastfeeding. However, telephone follow-up could not affect the maternal attachment scores. The mean attachment score was significantly higher in mothers with a planned pregnancy ($P < 0.001$), higher financial income ($P < 0.01$), and a girl baby ($P < 0.014$).

Conclusions: This study confirmed the beneficial effect of BFT and telephone follow-up on mothers' knowledge, attitude, and performance toward breastfeeding. Therefore, integration of BFT and telephone follow-up in postpartum care programs are suggested.

Keywords: Attachment, Breastfeeding, Education, Follow-up, Maternal, Telephone

Address for correspondence: Dr. Mohsen Adib-Hajbaghery, Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, Iran.
E-mail: adib1344@yahoo.com

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INTRODUCTION

Breastfeeding has a major role in the children's growth and development. The mother's milk is the main source of infant's nutrition in the first 4–6 months and then up to 2 years, along with supplementary feeding.[1] Despite the benefits of breastfeeding, some mothers have serious difficulties in starting and continuing breastfeeding.[2,3]

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Encouraging breastfeeding is a public health priority in many countries. Early breastfeeding and increasing its duration, not only improves mothers' relationship to their newborns[4] but also decreases their stress and anxiety.[1-4]

Maternal attachment is defined as a stable emotional bond between mother and infant. According to attachment theory,

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mothers with sufficient information on breastfeeding and stronger attachment to her newborn, tend to start and continue a successful breastfeeding.[5]

In a recent study, significant associations were found between breastfeeding and the baby-mother psychological attachment, as well as the mother's capacity in responding to the baby's emotional needs.[6,7] In a study by Tharner *et al*. also a connection was observed between breastfeeding duration and the attachment responses between mother and baby.[8] In another study, education of mothers on attachment behaviors during pregnancy increased their fetal attachment and reduced their anxiety.[9]

In recent years, telephone counseling has increasingly used for postdischarge follow-up and patient education, especially for patients with difficulties in the direct clinical referral.[10] A Korean study in patients with heart failure has shown that telephone follow-up could not only increase the patients' sense of responsibility and skills in self-care but also have decreased their level of stress.[11] A study in Iran has also shown that telephone follow-up could reduce hospital readmissions in patients with heart failure.[12] It has also been shown that telephone counseling could increase the quality and the duration of breastfeeding in Iranian nulliparous women.[13]

However, no study is available on the effect of telephone follow-up after the second delivery. Moreover, no study is available from Iran on the effect of telephone follow-up on the mothers' postpartum attachment to their newborns. Therefore, this study aimed to assess the impact of postpartum telephone follow-up on breastfeeding and the maternal attachment to the newborn.

MATERIALS AND METHODS

Study design and participants

This is a clinical trial study conducted on three groups of mothers who had a delivery at Alborz hospital, Karaj, Iran, during the spring of 2014. The sample size was calculated using the results of a study by Akbarzadeh *et al*. on the effect of learning attachment behaviors on maternal-fetal attachment.[9] In that study, the mean and standard deviation of maternal attachment in the intervention and control group were as follow at the end of the study: $\mu_1 = 64.6$, $\mu_2 = 61.1$, $sd_1 = 3.5$, $sd_2 = 5.1$. Then, considering $\beta = 0.20$, $\alpha = 0.05$, 25 patients were estimated to be needed in each group. However, we recruited 40 patients in each group to compensate the possible attrition. Sampling was carried out consecutively, and patients were randomly allocated into three intervention groups.

Inclusion criteria were as follows – Having a singleton delivery, starting breastfeeding, having a healthy hearing and ability to speech in Farsi, living in Karaj and suburbs, having access to a telephone or mobile phone, having a healthy newborn, accepting to have a postpartum visit in the next 10 days for performing the posttest of the study and also for screening the baby and the mother's health. Exclusion criteria were as follows – death of infant, sever infant or maternal illness or hospitalization leading to the lack of breastfeeding.

Instruments

The study data were collected using a three-part instrument including a demographic questionnaire, a breastfeeding questionnaire (BFQ), and a questionnaire for assessing mother's attachment to the newborn (MANB). The demographic questionnaire consisted of 15 questions about mother's characteristics, including age, living place, education level, occupation, number of children, sufficiency of monthly income, parity, sex of the newborn, those who lived with her, husband's education level, history of infertility, acceptance of the pregnancy (wanted/unwanted), type of delivery, and smoking. Moreover, there were questions on having skin contact with the newborn immediately after delivery, starting breastfeeding immediately after delivery.

The BFQ was designed through literature review.[14,15] This part consists of 30 questions in three subscales of mother's knowledge (13 items), performance (5 items), and attitude toward breastfeeding (12 items). The 13-item knowledge subscale is scored as yes = 1 or no = 0. The items of performance are scored on a three-point Likert scale with options of never = 0, sometimes = 1, and always = 2. The items of attitude subscale are also scored on a three-point Likert scale with options of quite disagree = 0, having no idea = 1, and quite agree = 2. The maximum score in the knowledge, performance, and attitude subscales could be 13, 10, and 24, respectively, and higher scores show higher knowledge, better performance, and positive attitude. The content validity of the BFQ was confirmed by ten nursing and midwifery educators at Kashan University of medical sciences (KAUMS). For reliability assessment, the BFQ was administered to 15 mothers who were not included in the main study. The reliability of the knowledge subscale was then calculated through the Kauder–Richardson method as 0.80 while the performance and attitude sections were examined through Cronbach's alpha method and were calculated as 0.74 and 0.78, respectively.

The MANB was designed based on the Cranley's attachment scale.[16] The original Cranley's attachment scale contains 24

items and has previously translated into Persian by Abasi *et al*.[17] However, in the present study, through the process of content validity assessment we added 9 items to the scale according to the expert opinions. Therefore, the MANB scale used in this study consists of 33 questions that are answered on a three-point Likert scale with options of no = 0, having no idea = 1, and yes = 2. The content validity of the MANB was assessed and confirmed by ten nursing and midwifery educators at KAUMS. The reliability of the MANB was also examined through Cronbach's alpha that was 0.75 for the total scale. For this reason, the MANB was administered to 15 mothers who were not included in the main study.

Procedures

For participant recruitment, the researcher was present at the prepartum unit of the hospital for one month. She assessed all pregnant women to find the ones with inclusion criteria. Then, they were briefed about the study purposes and were invited to fill out the study instruments if they agreed to take part in the study.

All data were gathered by the investigators. The demographic questionnaire was completed through individual interviews after delivery when the mothers had no pain and were physically in good condition. Other interventions in the three groups were as follows:

- The Group 1 received breastfeeding training (BFT), then answered the BFQ and received telephone follow-up and finally passed the posttest at the end of the study
- The Group 2 answered the BFQ at the beginning of the study but did not receive BFT. This group received telephone follow-up and finally passed the posttest at the end of the study
- The Group 3 first answered the BFQ, then received BFT, but did not receive telephone follow-up. This group finally passed the posttest at the end of the study [Figure 1].

All telephone follow-ups were conducted in the 3rd–5th postdischarge day before mothers refer to the clinic for health visit and screening. Each mother was contacted for two times with an interval of 48 h. All telephone contacts were made between 10 am to 16 pm and lasted for at least 10 min. In telephone contacts, mothers were questioned about the state of breastfeeding and the mother's relationship with the baby or any problems experienced by mother. Then, the researcher answered the mothers' queries on problems or difficulties occurred. Furthermore, all mothers were advised to refer to the clinic with their baby on the first 10 days after hospital discharge. Moreover, a telephone number was provided to all mothers to ask their questions and receive guidance if necessary.

All mothers were referred to the clinic for their health visit and screening of newborn within the 7–10 days after

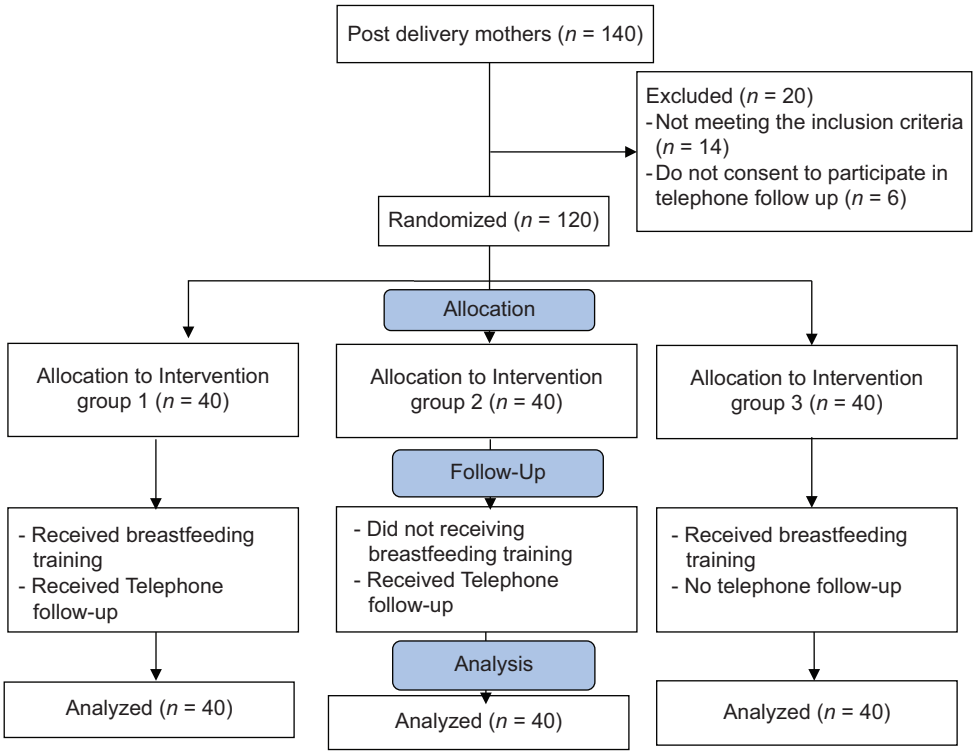

Figure 1: The consort flowchart of the study of the effect of telephone follow-up on postdelivery breastfeeding and maternal attachment

discharge. At this time, the BFQ was answered again, and also the MANB questionnaire was answered.

Ethical considerations

Data collection and intervention was started after the permission was received from the Research Council of Nursing and Midwifery School of Kashan University of Medical Sciences. The aim of this study was explained to all the participants, and they signed a written informed consent form. Moreover, the participants were assured that their personal data would be kept confidential and that they are free to participate in the study. Permissions were obtained from the hospital authorities, as well.

Data analysis

Data analysis was performed using SPSS 11.5 software (SPSS, Inc., Chicago, Illinois, USA). Descriptive statistics (frequencies, means, and standard deviations) were calculated for mothers' characteristics. Analysis of variance and Tukey *post hoc* tests were used to compare the mean scores of BFQ and MANB in the three groups. Moreover, Paired *t*-test was used to compare the mean scores of BFQ subscales (i.e., knowledge, attitude, and performance) in each group at the start and the end of the study. Analysis of covariance was also conducted to examine the effects of mothers and the babies' characteristics on breastfeeding. Statistical significance was considered at $P < 0.05$.

RESULTS

A total of 120 mothers participated in this study. The demographic characteristics of the participants are presented in Table 1. No statistical significant differences were observed in the three groups except for the number of children ($P = 0.001$). Table 2 compares the three groups regarding overall breastfeeding mean scores and its three subscales at the beginning of the study. Although the analysis of variance showed significant differences between the three groups; however, the Tukey *post hoc* analysis could not find any significant differences between the mean scores in the intervention groups 1 and 3 ($P > 0.05$), while all the mean scores were significantly lower in the group 2 (that did not receive BFT) than the groups one and three (that have received BFT) ($P \leq 0.006$).

Table 3 also compares the three groups regarding overall breastfeeding mean scores and its three subscales at the end of the study. All the mean scores were increased in all the three groups and especially in the group 2. However, all the mean scores were yet higher in the groups 1 and 3

Table 1: Comparison of demographic and profile of the three intervention groups

Variables	Groups			*P*
	Group 1 (breastfeeding trainings-telephone follow-up)	Group 2 (no breastfeeding trainings-telephone follow-up)	Group 3 (breastfeeding trainings-no telephone follow-up)	
Age of mother	28.28±4.88	29.28±7.13	29.12±4.38	0.691
Number of children	1.42±0.84	0.62±0.77	1.6±0.9	0.001
Type of delivery*				
Normal vaginal delivery	17 (42)	18 (45)	21 (52.5)	0.87
Cesarean section	23 (57.5)	22 (55)	19 (47.5)	
Sex of the newborn*				
Male	21 (52.5)	20 (50)	20 (50)	0.067
Female	19 (47.5)	20 (50)	20 (50)	
History of infertility*				
Yes	4 (10)	7 (17.5)	3 (7.5)	1.965
No	36 (90)	33 (82.5)	37 (92.5)	
Having skin contact*				
Yes	34 (85)	39 (97.5)	37 (92.5)	3.864
No	6 (15)	1 (2.5)	3 (7.5)	
Pregnancy*				
Wanted	30 (75)	34 (85)	25 (62.5)	5.306
Unwanted	10 (25)	6 (15)	15 (37.5)	

*All data presented as: *n* (%) or mean±SD. SD: Standard deviation

Table 2: Comparison of the three groups in terms of overall breastfeeding mean scores and its three subscales at the beginning of the study

Variables	Group			*P*
	Group 1 (breastfeeding trainings-telephone follow-up)	Group 2 (no breastfeeding trainings-telephone follow-up)	Group 3 (breastfeeding trainings-no telephone follow-up)	
Knowledge	10.92±1.01	9.38±1.24	11.20±0.97	0.001
Performance	7.50±1.56	6.32±0.84	7.42±1.70	0.004
Attitude	21.13±2.86	19.52±2.46	21.45±3.02	0.006
Total	39.55±4.18	35.24±3.65	40.08±4.81	0.001

than in the group 2. Analysis of variance showed significant differences between the three groups, however, the Tukey *post hoc* analysis could not find any significant differences between the mean scores in the intervention groups one and three ($P > 0.05$), while all the mean scores were significantly lower in the group two (that did not receive BFT) than the groups 1 and 3 (that have received BFT) ($P \leq 0.001$).

To examine the possible effect of mothers' and babies' characteristics on breastfeeding, analysis of covariance was done and showed that among all variables, only the mothers' study group, having immediate skin contact with baby, and age of mother had statistically significant effects on breastfeeding. Table 4 shows that 42% of changes in breastfeeding can be explained by the model including these three variables.

Table 5 compares the mean scores of maternal attachment regarding the study groups and some demographic and clinical variables. The mean maternal attachment scores were significantly higher in mothers with a planned pregnancy ($P < 0.001$), higher financial income ($P < 0.01$) and those with a girl baby (0.014). No significant differences were found in maternal attachment regarding the study groups, type of delivery, history of infertility, and having immediate skin contact with the newborn.

Table 3: Comparison of the three groups in terms of overall breastfeeding mean scores and its three subscales at the end of the study

Variables	Group			*P*
	Group 1	Group 2	Group 3	
Knowledge	12.55±0.64	11.50±0.91	12.50±0.91	0.001
Performance	9.60±0.92	8.30±1.26	9.60±1.12	0.001
Attitude	23.35±1.12	21.95±1.33	23.45±2.25	0.001
Total	45.50±1.86	41.75±2.19	45.55±4.01	0.001

Table 4: The results of analysis of covariance when the patients' and babies' characteristics entered the model (breastfeeding score at the start of the study was used as dependent variable)

Source	Type III sum of squares	df	Mean square	*F*	*P*
Corrected model	91.06[a]	4	22.767	21.168	<0.001
Intercept	282.86	1	282.86	263.01	<0.001
Study group	84.79	2	42.39	39.42	<0.001
Having immediate skin contact with baby	12.32	1	12.32	11.45	<0.001
Age of mother	4.45	1	4.45	4.14	0.044
Error	123.68	115	1.07		
Total	13455.25	120			
Corrected total	214.74	119			

[a] $R^2 = 0.42$ (adjusted $R^2 = 0.40$)

Table 5: Comparison of mean scores of maternal attachment in terms of some of demographic and clinical variables

Variable	Attachment	*P*
Study group		
Group 1	62.85±3.54	0.328
Group 2	61.63±4.41	
Group 3	61.75±4.04	
Having skin contact		
Yes	62.01±4.03	0.55
No	62.80±4.05	
Pregnancy		
Wanted	62.92±3.60	0.001
Unwanted	59.65±4.23	
History of infertility		
Yes	63.71±2.99	0.05
No	61.86±4.11	
Sufficiency of monthly income		
Yes	62.34±3.83	0.01
No	59.21±5.16	
Sex of the newborn		
Male	61.20±4.35	0.014
Female	62.98±3.46	
Type of delivery		
Normal vaginal delivery	62.54±3.57	0.23
Cesarean section	61.67±4.36	

DISCUSSION

This study was conducted to investigate the effect of BFT and telephone follow-up on breastfeeding and postpartum maternal attachment to the newborn. The present study showed that the groups that received BFT had higher levels of knowledge toward breastfeeding both before and after the telephone follow-up. Evidence showed that almost all mothers have physical problems during breastfeeding. These problems along with inadequate knowledge about the benefits of breastfeeding might contribute to delay or early cessation of breastfeeding.[18,19] A training program such as the one implemented in this study can improve the mother's knowledge Therefore, nurses and midwives are responsible to train mothers on the technique and the health benefit of breastfeeding both for mothers and infants. Some of the studies also showed that such training programs might be more effective if conducted in the fires post deliver days and be reinforced repeatedly in the first 6 months.[20]

The present study also showed BFT not only increased the knowledge of mothers but also improved their attitude toward breastfeeding both before and after the telephone follow-up. Attitude is defined as; acquired internal states that influence the choice of personal action toward some class of things, persons, or events.[21] Previous studies also showed that mothers breastfeeding attitude depend on their knowledge and the level of confidence to this knowledge.[18]

The present study showed that the groups that received BFT had better performance toward breastfeeding both before and after the telephone follow-up. Conversely,

Sharifirad *et al*. have reported that although BFT offered by health-care centers, hospitals, and through public media have positive effects on mothers' knowledge about the benefits and importance of breastfeeding, but have limited effects of their performance in successful breastfeeding.[1] Perhaps, only theoretical teaching might not be adequately effective in solving the difficulties in breastfeeding. It seems that good knowledge, skill, and attitude and confidence to exercise existing learnt knowledge are the prerequisites for good performance on breastfeeding.

Results of the present study showed that telephone follow-up had positive effects on mothers' knowledge and performance in breastfeeding. The mean scores of breastfeeding were increased in all group; however, the level of increases was much higher in those without BFT but with telephone follow-up. Similarly, Raisi Dehkordi *et al*. investigated the effect of telephone follow-up on mothers' performance in breastfeeding and reported that the intervention could increase the duration of breastfeeding.[15] Evidence showed that people usually forget a considerable part of the material they are taught in a single session. Then, training should be repeated and reinforced if it should be effective.[22] As presented in this study, telephone follow-up is a good method for strengthening the results of the training sessions. Studies also showed that telephone follow-up is a good method not only for supporting mothers and increasing their knowledge and practice in breastfeeding[23-25] but also in improving the maternal and infants health and decreasing their morbidity.[26] It seems that telephone follow-up and counseling act as a supportive method for mothers and decreases their problems through providing supportive information that might consequently increase the mothers' peace of mind and confidence in breastfeeding. Therefore, breastfeeding skills should not only be taught to mothers but also should be strengthened through appropriate supportive follow-up methods. Several studies on telephone follow-up showed its positive effects on patients with diabetes, heart failure, and also on mothers performance in breastfeeding.[6,10,15]

The present study also showed that telephone follow-up positively affected on mothers' attitude toward breastfeeding. A recent qualitative study also showed that mothers who received telephone follow-up were highly satisfied and felt strengthened, supported, empowered, and secure, as a result of the continuous telephone support provided by staff who were knowledgeable and experienced.[27] Another study in Sweden has also shown that telephone follow-up not only improved maternal feelings toward their preterm babies but also increased their confidence and performance in breastfeeding, and also increased the duration of breastfeeding.[6] Studies showed that mothers's attitude toward breastfeeding depend on the level of confidence, intention, and support they received from the healthcare providers and their family.[18] Telephone follow-up can be a good, accessible, and cost-effective strategy for supporting the mothers in the process of initiation and continuation of breastfeeding. This strategy can be implemented according to the individual needs of mothers, and it is recommended to be started from the early postdelivery days and be continued at least for 6 months (McCann *et al*. 2010). Through telephone follow-up nurses not only inspire the mother a sense of being supported but also can assess mothers problems, provide them solutions, strengthen their intention and confidence, and self-esteem, and motivate them for continuing breastfeeding.[28,29]

In the present study, no significant difference was found between the mean scores of maternal attachment to the baby in the three groups. These findings signify that neither BFT nor telephone follow-up significantly affected the maternal attachment score. No previous study assessed the effect of telephone follow-up on maternal attachment. However, it seems that all mothers irrespective of their breastfeeding practice or receiving telephone follow-up would develop a sense of attachment toward their neonate. The insignificant effect of telephone follow-up on maternal attachment might be attributed to the short-term follow-up in the present study.

In the present study, no significant relationships were found between maternal attachment and variables such as the type of delivery, history of infertility, and having immediate skin contact with the newborn. A Canadian study reported that the establishment of skin contact between mother and baby could not only facilitate breastfeeding and increase its duration but also improved the mothers' attachment to their babies.[2]

The present study showed that the mean maternal attachment score was significantly higher in mothers with a planned pregnancy. Two earlier studies in Iran also reported the same findings.[30,31] However, another study in England reported that also those women with an unplanned pregnancy are more vulnerable to attachment difficulty, both women with planned and unplanned pregnancies would finally accept their pregnancy and will develop a good attachment to the baby if receive appropriate social support.[32] Although the conflict between studies can be attributed to the cultural difference, it seems that mothers with an unplanned pregnancy worry more about the risks toward the pregnancy and the baby and these worries

negatively affect the development of attachment to the baby.

The present study also showed that the mean maternal attachment score was significantly higher in mothers with higher financial status. A previous study in Iran has reported the same finding.[30] However, another study in Iran could not find a relationship between the mothers financial status and their attachment to the baby.[33] It seems that maternal attachment behaviors are influenced by the woman's financial status. Perhaps, women with low economic status are more preoccupied with her financial problems, and costs the newborn bring in their family life. These worries may negatively affect the development of attachment relationship.

The present study showed that the mean maternal attachment score was significantly higher in mothers with a girl newborn. An earlier study in Iran also reported that mothers who are satisfied with the sex of their babies are express more attachment behaviors.[30] However, a study in England reported that at the beginning of pregnancy most mothers have a preference for a particular gender. For example, some of the woman wants a girl so she can perpetuate the special relationship she enjoyed with her mother. However, at the end of pregnancy women are most worried about the baby's health.[32]

Although we did not study the effect of breastfeeding on maternal attachment, however, a previous study has shown that mothers with problems in breastfeeding had a lower level of attachment to their babies.[34]

This study had some limitations that may limit the generalizability of the results. Due to the nature of the present study, the researchers were not blind to the groups and the interventions they received. Moreover, the time of follow-up was short. Therefore, more studies with larger sample size and more extended follow-up are suggested. Furthermore, we did not assess the effect of breastfeeding on maternal attachment. Therefore, replicating the study and assessing the effect of breastfeeding and its duration on maternal attachment and vice versa is suggested. Moreover, we did not train the mothers on attachment behavior. Therefore, it is suggested that mothers be educated on such behaviors. Then, the effects of such behavior may be assessed.

CONCLUSIONS

This study confirmed the beneficial effect of BFT and telephone follow-up on the mothers' knowledge, attitude, and performance toward breastfeeding. Therefore, integration of BFT and telephone follow-up in postpartum care programs are suggested. In addition, training the mothers on attachment behavior might be beneficial in strengthening the breastfeeding behaviors. The mothers training on BFT and attachment behaviors also would help them manage their anxiety and problems in breastfeeding and improves the mothers and their newborns' health.

Conflicts of interest

There are no conflicts of interest.

Authors' contributions

Tayebeh Hashemi-Demneh participated in study design and conceptualization, data collection, and manuscript writing. Mohsen Adib-Hajbaghery participated in study design, supervision, data analysis and interpretation and manuscript revisions.

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