

# Investigation of the effect of postpartum home visit intervention on promoting mothers' exclusive breastfeeding in Falavarjan, Isfahan Province: clinical trial research

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**Summary Background.** Exclusive breastfeeding is the most ideal way to feed infants in the first 6 months of life. Various interventions have been made to encourage mothers to maintain exclusive breastfeeding.

**Objectives.** The aim of this study was to investigate the effect of postpartum home visits on exclusive breastfeeding.

**Material and methods.** The study was conducted in March 2020 and is a continuation of the clinical trial from 1988 conducted at the Department Imam Khomeini Hospital Falavarjan, which was performed on 100 mothers. They were randomly assigned into two groups of 50 participant. The intervention group received care at home, and the control group received postpartum care through the health center. Data analysis was performed using SPSS software, version 16. The significance level of the test was considered as 5% ( $p < 0.001$ ).

**Results.** The mean age of the mothers was  $27 \pm 6.89$  years. Exclusive breastfeeding at the end of day 42 after delivery was 84% in the intervention group and 38% in the control group. There was a significant difference ( $p \leq 0.001$ ) between the two groups. 64% of mothers in the breastfeeding intervention group breastfeeding according to the desire and demand of the infant compared to 10% in the control group. The use of pacifier was 16% in the intervention group and 28% in the control group. There was a significant difference ( $p \leq 0.001$ ) between feeding the infant with sugar water, and this was 4% in the intervention group and 28% in the control group.

**Conclusions.** Visiting and educating mothers at home after discharge has a significant effect on exclusive breastfeeding during the neonatal period.

**Key words:** house calls, breast feeding, exclusive breastfeeding, postpartum period.

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## Background

The future of a society is based on the health of the children of that society. In the early stages of life, breast milk is undoubtedly a food that often has features for ideal nutrition [1]. The effect of breast milk on the health of the infant and mother, the growth and survival of the infant, the reduction of mortality and disability, the satisfaction of the emotional needs of the mother and infant and the economic savings in the family and society have been proven [2]. Breastfeeding has preventative effects to reduce complications and death, diarrhea and intestinal bleeding, abdominal pain, asthma, acute respiratory infections, atopic diseases and jaundice during the neonatal period. It also reduces the risk of diabetes, weight gain and obesity in the future. Exclusive breastfeeding reduces the risk of acute respiratory infections by five times and the risk of dying from these diseases by four times [3–5]. In a study by Horta et al., breastfeeding was re-

ported to reduce the risk of type II diabetes by 35% [6]. A meta-analysis of 113 studies also showed that breastfeeding reduced the risk of obesity/overweight by 26% [7]. It is exclusive breastfeeding that is recommended as normal infant feeding in the first six months of life [8]. One of the primary health care goals is maternal and infant health. One way to ensure the health of the infant is to implement an exclusive breastfeeding plan until the age of six months and to continue breastfeeding along with supplementary food until the age of two [9]. Despite numerous recommendations about breastfeeding, rates of breastfeeding are particularly low, even in industrialized countries. The Center for Disease Control reported that the prevalence of exclusive breastfeeding by the sixth month was 21.9% in 2015 [10]. According to the latest data from the World Health Organization, 35% of all children under the age of six months in the world are exclusively breastfed. The goals of exclusive breastfeeding have not been achieved in Iran, and the Ministry of Health in 2006 re-



ported that the exclusive breastfeeding rate in the country was 28%. However, recent statistics of the Ministry of Health have not been reported on [11]. In one study by Dalili et al., exclusive breastfeeding of 31.17% was reported in Tehran [12]. In a study by Mirahmadzadeh et al., the rate of exclusive breastfeeding in Fars was reported to be 50.7% [13]. In the study of Mehrparvar et al. (2008–2009) in Kerman, the rate of exclusive breastfeeding was reported to be 1.6% [14]. A cross-sectional study in Canada found that although about 90% of mothers breastfeed their babies, exclusive breastfeeding for up to six months was seen in only 25% [15]. Decreased rates of exclusive breastfeeding have been reported in other studies with the passing of time after delivery. For example, exclusive breastfeeding in American women at the beginning of the postpartum period is 70.1%, while it reaches 33.2% in the sixth month after delivery [16]. Iran is the first country in the Middle East in which about 82% of hospitals are mother-infant friendly hospital [17]. Although the Ministry of Health has provided extensive measures to increase exclusive breastfeeding, and 9 out of every 10 children up to 12 months of age are breastfed, the rate of exclusive breastfeeding is lower than that recommended by the World Health Organization [18]. Infant-friendly hospitals around the world, including Iran, are trying to train and promote breastfeeding. This policy and plan has been implemented in most countries, including Iran, and thus the primary measures of breastfeeding have been highly successful in most countries and studies. The rate of postpartum breastfeeding in Iran is 98% [19]. However, the rate of exclusive breastfeeding decreases over time, and reaches 28% six months after delivery [17, 20]. The most common breastfeeding barriers reported in the United States include lack of knowledge about the benefits and ways of breastfeeding, lack of family and community support for breastfeeding, embarrassment of breastfeeding in public, returning to work and poor support by employers, inadequate health care support, breastfeeding problems including nipple sores, congestion, mastitis, pain and anxiety due to insufficient milk supply in breastfeeding [21]. Maternal support in the treatment of breastfeeding problems is one of the main factors in the success and empowerment of breastfeeding [22–24]. Community support measures are effective factors in maternal and infant health, which can vary from in-home services to providing services in outpatient clinics [25]. A home visit in the early postpartum period is very important, as it is critical for breastfeeding [26]. Although some plans with the strategy of child-friendly hospitals and with an emphasis on maternal support have improved and have increased breastfeeding to some extent, counseling and support after discharge is still needed to increase exclusive breastfeeding and reduce complications through home visits [27]. Over the past few decades, postpartum home visits to women and infants have received a great deal of attention [28]. The results of a recent study showed that home visits after childbirth are the best way to meet the educational and support needs of the family. As it is difficult for families to come and go from one place to another in the first days after labor, it is better to provide services and care related to this period at home [29]. A study conducted by Bashour et al. in Syria showed that home visits increased the amount of exclusive breastfeeding [30]. One study in Iran by Sakkaki et al. also showed that a home visit increases the amount of exclusive breastfeeding [11].

## Objectives

The aim of this study is to investigate the effect of breastfeeding support with a home visit plan on exclusive breastfeeding. Our hypothesis is that breastfeeding counseling using a home visit plan, direct contact with the mother and training at home will increase the amount of exclusive breastfeeding. This study was conducted considering the importance of exclusive breastfeeding in the first six months of life and its benefits, as well as considering the importance of home visits and the lack of similar studies in Iran.

## Material and methods

This study is a randomized clinical trial that was conducted in 1998 in the delivery ward of the Imam Khomeini Falavarjan Hospital, Isfahan University of Medical Sciences. The research project has been approved by the ethics committee of Shiraz University of Medical Sciences under the code IR.SUMS.REC.1397.917.

A sample size of 46 women in each group was estimated according to the objectives and type of study and was based on previous studies (30–34) in this field, taking into account the assumptions of: 5% error, 80% power and a ratio of 58% and 30% in the two investigated groups, as well as the 1-1 ratio in each of the two groups using the formula

$$n = \frac{2\bar{p}(1-\bar{p})(t_{\alpha,v} + t_{\beta(1,v)})^2}{(\delta)^2}$$

Considering the loss of 10% of sample size, 50 individuals for each group and a total of 100 individuals were considered. Finally, using a simple purposive sampling and based on random permuted block randomization with a block size of 4 (in this method, the letter A is used for the intervention group, and the letter B is used for the control group, and the f blocks are AABB, BBAA, ABAB and BABA, which are used in randomized sampling to complete the sampling), 100 individuals were divided into two groups of intervention (home visit) and control (receiving postpartum care in health centers).

The study inclusion criteria were:

- Agreeing to participate in the study,
- Natural delivery without complications,
- Gestational age between 37 to 42 weeks,
- Infant weight between 2,500 to 4,000 g,
- Length of stay in hospital less than 48 hours,
- Iranian nationality,
- Written consent for participation in the study,
- A completely healthy infant without congenital anomalies or pathological jaundice within the first 24 hours,
- The distance from home to the hospital should be less than 20 km.

The study exclusion criteria were:

- Mothers with high-risk pregnancies, such as: diabetes, high blood pressure and vaginal bleeding,
- Premature infants,
- Neonatal polycythemia,
- Cephalohematoma,
- Mother's unwillingness to continue participating in the project for any reason.

Sampling was performed in March 2020 within one month.

## Intervention method

The study included five sessions of maternal visits. The first visit was made to the hospital before discharge. During the first session, the completed form of maternal consent to participate in the study was received, the initial data collection form and demographic information were completed, training was given to the patient and her companion according to the plan and four more sessions of home visits on the third day (second visit), seventh day (third visit), fourteenth day (fourth visit) and forty-second day (fifth visit) in coordination with the patient, and training was given to the patient and her family. Each home visit session consisted of three parts: The first part included questions and assessments of the mother's physical and mental recovery and the necessary examinations, the second part included planning training for each session, and the third part was the completion of a checklist and questionnaire. Parents' questions were also answered during the visit. The data collection form would be completed on the forty-second day after delivery in accordance with the fifth session of the home visit. The researcher's phone

**Table 1. Home visit training program and educational goals and materials in each visit**

Visit sessions	Visit time	Visit goals	Educational content of the session
First session	After delivery, before discharge from the hospital	<ol style="list-style-type: none"> <li>1. Creating and strengthening self-esteem and emotional support for mothers</li> <li>2. Breast examination in terms of problems and breastfeeding</li> <li>3. Breastfeeding training according to the plan</li> <li>4. Observing breastfeeding and discovering problems</li> <li>5. Completing the information section of the questionnaire and information about delivery and frequent breastfeeding</li> <li>6. Emphasizing exclusive breastfeeding</li> </ol>	<ul style="list-style-type: none"> <li>Training of the benefits of being a mother and baby in a shared room</li> <li>Training of the benefits of colostrum and its impact on the health of the infant</li> <li>Training to not use a pacifier, bottle of milk, dry milk powder, water, sugar water, etc.</li> <li>Learning the correct way of holding the infant and breastfeeding</li> <li>Training of frequent breastfeeding and breastfeeding from both breasts during each feeding</li> <li>Training of the signs of infants preterm hunger</li> <li>Training of hand washing with soap and water before each breastfeeding</li> <li>Training of breast washing only with water</li> <li>Training of how to prevent and treat nipple sores</li> <li>Training the symptom of breast engorgement and its treatment</li> <li>Training of exclusive breastfeeding up to age of six months</li> <li>Training of the mother's diet during breastfeeding</li> </ul>
Second session	Third day after delivery	<ol style="list-style-type: none"> <li>1. Creating and strengthening self-esteem and emotional support for mothers</li> <li>2. Breast examination in terms of problems and breastfeeding</li> <li>3. Breastfeeding training according to the plan</li> <li>4. Emphasizing exclusive breastfeeding</li> <li>5. Emphasizing breastfeeding according to the desire and demand of the infant</li> </ol>	<ul style="list-style-type: none"> <li>Training of the signs of adequate breast milk</li> <li>Training of how to properly try to burp the breastfed infant after each breastfeeding</li> <li>Training of continuous breastfeeding in case of infant illness</li> <li>Training of breastfeeding based on infant desire and demand</li> <li>Training of signs of mastitis and its treatment</li> <li>Training of the effect of breast size in the production of milk</li> <li>Training of the least amount of breastfeeding within 24 hours</li> <li>Training of the correct method to put the infant to sleep after breastfeeding</li> <li>Training of milking and storage of breast milk in the correct way</li> </ul>
Third session	Seventh day after delivery	<ol style="list-style-type: none"> <li>1. Strengthening self-esteem and emotional support for mothers</li> <li>2. Ensuring breastfeeding in the right way by observing breastfeeding</li> <li>3. Answering the mother's questions</li> <li>4. Emphasizing exclusive breastfeeding</li> </ol>	<ul style="list-style-type: none"> <li>Training to use a lactation bra</li> <li>Training of strengthening the emotional relationship between mother and infant by breastfeeding</li> <li>Training to continue breastfeeding at night, especially from 12 pm to 6 am</li> <li>A review of all previous trainings</li> </ul>
Fourth Session	Fourteenth day after delivery	<ol style="list-style-type: none"> <li>1. Strengthening self-esteem and emotional support for mothers</li> <li>2. Answering the mother's questions</li> <li>3. Emphasizing exclusive breastfeeding</li> </ol>	We evaluate the mother to make sure she has learned the material well by asking questions about the training she received during previous sessions. We give the mother an educational pamphlet
Fifth session	Forty-second day after delivery	<ol style="list-style-type: none"> <li>1. Completing the questionnaire</li> <li>2. Answering the mother's questions</li> </ol>	We evaluate the mother to make sure she has learned the material well by asking questions about the training she received during previous sessions with emphasis on exclusive breastfeeding up to six month of age

number was provided to mothers so that they could contact the researcher if any problems or questions arose. The control group could receive care only by visiting health centers. Details of the educational content of each home visit session are given in Table 1. At the end of each session, a checklist was completed to ensure complete training.

Data collection tools included a data collection form, checklist, scale, measuring tape and height gauge. The data collection form contained information related to the demographic characteristics of the units and questions related to the mother's delivery and breastfeeding information. The control group received postpartum care through health centers. They filled out the initial questionnaire and consent form before discharge from the

hospital and received no training. On the 42<sup>nd</sup> day after delivery, the final questionnaire was completed, and their infant's height, weight and head circumference were measured.

### Statistical analysis methods

Quantitative data was reported as mean  $\pm$  SD and qualitative data as percentages (%). Descriptive statistics (mean frequency and standard deviation) and inferential statistics (Fisher's exact test to distribute the frequency of nutrient distribution in both groups and Chi-square test) were used for data analysis. All statistical calculations were performed using SPSS software for Windows, Version 16.0. Chicago, SPSS Inc.

Results

Figure 1 shows the trial profile.

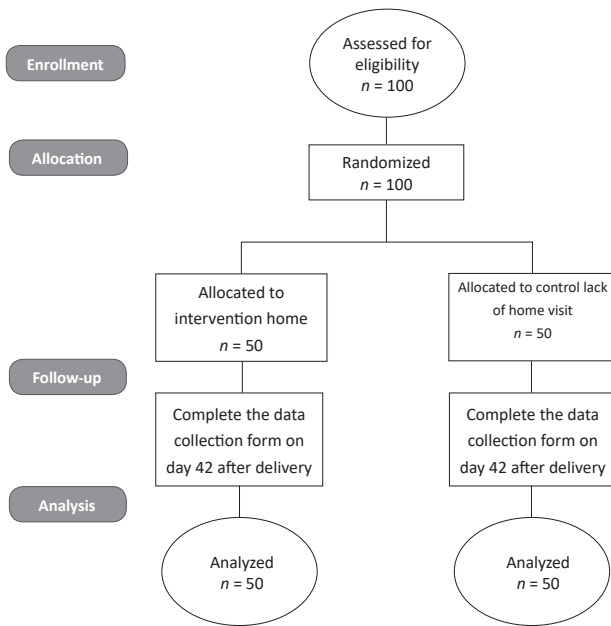


Figure 1. Consort of trial profile

The average age of the mothers was 27 ± 6.89 years. In terms of parity, 62% of mothers were multiparity, with no significant difference between the two groups (p > 0.05). The level of education of 32% of mothers in the intervention group and 48% in the control group was diploma. There was no significant difference between the two groups in the level of education of

the mothers in the intervention group and the control group (p > 0.05). The level of education of 44% of fathers in the intervention group and 54% in the control group was diploma, and there was no significant difference between the two groups of intervention and control in education (p > 0.05). 94% of mothers were housewives, and most fathers were self-employed. 10% of mothers in the intervention group and 54% of mothers in the control group gave their infant water, sugar water or dry milk powder in addition to their own breast milk. 10% of mothers in the intervention group and 34% of mothers in the control group said that the reason for giving other foods to their infant was due to not having enough breast milk. 12% of mothers in the intervention group and 62% of mothers in the control group breastfed their infant when they were restless or crying. Infant feeding based on infant desire and demand was 64% in the intervention group and 10% in the control group. The use of sugar water in infant feeding was 4% in the intervention group and 28% in the control group, and there was significant difference between the two group p < 0.05). The demographic information of the studied units is provided in Table 2.

The mean gestational age was 38 ± 2 weeks. The average number of live births was 1.6 ± 0.99. The delivery information is given in Table 3. The independent t-Test showed that the mean gestational age, maternal age, number of pregnancies and number of live births did not differ significantly between the two groups (p > 0.05). In addition, the type of delivery was normal in all mothers in both groups.

Exclusive breastfeeding in the two groups at the end of the intervention (the forty-second day after delivery) was significantly different and is shown in Table 4. At the end of the forty-second day after delivery, the rate of exclusive breastfeeding was 84% in the intervention group and was only 38% in the control group. Thus, the frequency of exclusive breastfeeding in the intervention group was significantly higher than that of the control group (p < 0.05).

Table 2. Demographic characteristics individual between intervention and control

		Group		p
		Intervention	Control	
Mother age		27.76 ± 6.41	27.08 ± 7.40	0.62
Mother's education	high school	25 (50%)	16 (32%)	0.530
	diploma	15 (30%)	24 (48%)	
	college	10 (20%)	10 (20%)	
Father's education	high school	24 (48%)	20 (40%)	0.543
	diploma	22 (44%)	27 (54%)	
	college	4 (8%)	3 (6%)	
Mother's job	house wife	48 (96%)	47 (94%)	0.153
	university student	0 (0%)	2 (4%)	
	other	2 (4%)	1 (1%)	
Father's job	freelance job	22 (44%)	33 (66%)	0.572
	manual worker	12 (24%)	8 (16%)	
	farmer	2 (4%)	3 (6%)	
	military	0 (0%)	2 (4%)	
	driver	2 (4%)	2 (4%)	
	confectionary	2 (4%)	0 (0%)	
	other	10 (20%)	2 (4%)	

Table 3. Maternal fertility and child birth information for the intervention and control group

		Groups		p
		Intervention	Control	
Gravidity	multipara	31 (62%)	31 (62%)	0.588
	nulipara	19 (38%)	19 (38%)	
Gestational age		38.47 ± 2.72	39.01 ± 1.17	0.20
Number of live birth		1.60 ± 1.07	1.68 ± 0.91	0.69

**Table 4. Comparison of frequency distribution of nutrition between the two groups**

	Groups		p
	Intervention	Control	
Exclusive breastfeeding	42 (84%)	19 (38%)	> 0.001
Formula	2 (4%)	6 (12%)	
Breastfeeding with other thing	6 (12)	25 (50%)	

## Discussion

This study was conducted to investigate the effect of home visits in the postpartum period on the rate of exclusive breastfeeding. Exclusive breastfeeding at the end of day 42 after delivery in the intervention group was higher than that of the control group. The statistical Chi-square test showed a statistically significant difference between the two groups after the intervention ( $p < 0.05$ ). In a study conducted by Bashour et al. in Syria, the closest country to Iran, the rate of exclusive breastfeeding was reported to be 30% in the group that received home visits and 20% in the control group. In this study, four home visits were performed on the first, third, seventh and fortieth days after delivery [30]. In a study by Sakkaki et al., in Tehran, the rate of exclusive breastfeeding in the intervention group was reported to be 82.4% and 57.6% in the control group. In this study, mothers in the intervention group experienced three home visits 3, 10 and 30 days after delivery [11]. In a study by Amiri et al. conducted in Tehran, the reported rate of exclusive breastfeeding in the intervention group who received a home visit was 84% and was 64% in the control group. In this study, mothers received two home visits 3–5 and 13–15 days after delivery, and exclusive breastfeeding was compared for the two groups on the 60<sup>th</sup> day after delivery [31]. The results of studies suggest that providing home care in the postpartum period can have a positive effect on increasing the amount of exclusive breastfeeding. This is because by seeing the mother's living environment and getting to know her family, her surroundings and her culture, we can provide more advice and better breastfeeding training to the mother and her family, which in turn affects her behavior and decision to breastfeed exclusively. In this way, the mother's problems and issues related to breastfeeding can be closely observed and appropriate action can be taken, and the mother's questions and ambiguities can be answered correctly. After implementing the home visit plan, infant formula feeding and breastfeeding along with other things was less in the intervention group than that of the control group.

In this study, these factors do not seem to have a significant effect on infant feeding, because the level of education and job status of the parents in the two groups were similar. Mothers who are not supported and assisted by health workers after discharge and are left in the hands of the family are exposed to premature discontinuation of exclusive breastfeeding. In this study, most of the mothers in the control group stated that they started supplementary feeding with other milk or sugar water due to a lack of breast milk and the infant's hunger. Mothers recognized the infant's hunger from his/her many cries and mentioned that they started this type of nutrition on the advice

of others while in the control group, because the training was given in the presence of the person in charge of the mother's care, and most of them accepted the visitor's recommendations for exclusive breastfeeding. The main reason for the lack of exclusive breastfeeding was breast problem such as invert or flat nipples-fissures in the breast as well as lack of belief in the adequate of milk for their baby [11]. The study by Bashour et al. found that exclusive breastfeeding was the only outcome that was improved by home visits [30]. Edraki et al. also showed that home visits affect the pattern of exclusive breastfeeding in the second, third and sixth months, which increased the duration of exclusive breastfeeding [32]. Pabarga et al. stated that a higher percentage of mothers followed exclusive breastfeeding during a home visit at the end of the first and second months [33]. Therefore, it is essential to support mothers after discharge from the hospital and provide them with ongoing training in maintaining a high level of exclusive breastfeeding. The important point is the lack of adequate education of the mother, especially in the prenatal period and when the mother is hospitalized in the postpartum period.

According to the results of this study, it seems that the training given to mothers during pregnancy and the measures of mother-infant friendly hospitals in promoting exclusive breastfeeding are insufficient. Helping and supporting mothers after discharge from the hospital is very important, especially in the first days when the problems of the mother and infant are at their peak. It can be said that the postpartum period is very important and we (midwifery care team) can't be indifferent to these days without the attention and care of mothers and babies. By considering the mentioned problems, home visits and the education of mothers can be good ways to increase exclusive breastfeeding. It is also recommended that a person in charge of the mother's care be present at the mother's home.

## Conclusions

Visiting and educating mothers at home after discharge has a significant effect on exclusive breastfeeding during the neonatal period. Therefore, this type of care can be recommended to health authorities.

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