

Original Article

Designing and Evaluating an Empowering Program for Breastfeeding: A Mixed-Methods Study

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Introduction

One goal of the third millennium is planning and policymaking for empowering women to promote their health condition.¹ In addition, psychological empowerment of women may enhance their maternal role and alleviate their distress.² Empowerment is defined as power, control, independence and development, which is closely related to individuals' knowledge and experience, choice, option and decision-making.³ Kabeer considers empowerment as development of individuals' abilities to make substantial decisions for life, while these capabilities had been previously overlooked.⁴ Sardenberg defines empowerment as interrelated stages of change in consciousness, which mostly happens in individuals' minds. The main goal of empowerment is to grant individuals the right to make decisions based on the provision of education, critical thinking and raising knowledge and skills to create the change.⁵

Empowering mothers in breastfeeding is a key factor affecting motivational, psychological and flexibility

aspects of breastfeeding. Breastfeeding empowerment can maintain the continuation of breastfeeding.^{6,7} A study showed that breastfeeding empowerment, along with encouraging women to participate and helping with resolving breastfeeding problems, improves self-efficacy and control over the environment. It also encourages active participation and proactive interventions to find solutions for environmental problems.⁷

The significance of breastfeeding for the health and vitality of the woman and infant is widely acknowledged.⁸ It also reduces infant mortality, reduces complications in women and reduces healthcare costs.⁹ According to the World Health Organization (WHO), all infants should be exclusively breastfed for at least 6 months. Also, they should receive complementary foods with continuous breastfeeding up to 2 years after birth.¹⁰ However, across the world, in the Eastern Mediterranean Region and in Iran, only 37%, 36%, and 28% of infants are exclusively breastfed for 6 months, respectively.¹¹ Successful breastfeeding depends on various psychological and physiological factors

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of mothers. Interruptions in breastfeeding are related to lack of knowledge about breastfeeding during pregnancy, lack of intent for breastfeeding, postpartum problems and concerns, women's concerns about their adequacy for breastfeeding, lack of spousal support, emotional stress, lack of self-efficacy, unavailability of healthcare providers to help with breastfeeding problems and lack of support and encouragement by healthcare workers and family.¹²⁻¹⁴ Besides, psychological and motivational factors for continuous breastfeeding are of great importance.^{7,15,16}

Studies on breastfeeding are mostly quantitative and have limitations in terms of identifying comprehensive factors affecting breastfeeding in a local context. While quantitative research can explain the cause and effect relationships, understanding phenomena in natural conditions and providing an in-depth understanding of them require qualitative research. In addition, compared to qualitative and quantitative studies alone, mixed-methods studies may provide better understanding of the phenomena. Mixed-methods studies help with the evaluation of a phenomenon from various angles by using both qualitative and quantitative methods, thus improving the accuracy and rigor.¹⁷ Despite numerous programs proposed for promoting breastfeeding, breastfeeding empowerment has been undermined. Also, empowering women is a multidimensional and complex phenomenon, which is described by different behaviors and norms in different communities which change over time.¹⁸ Mixed-methods studies are the best option for examining various aspects of this phenomenon. Since no mixed-methods studies have been conducted on breastfeeding empowerment among Iranian women, the aim of this mixed-methods study is to design and evaluate an empowering program for breastfeeding in the Iranian context.

Patients and Methods

Design

A mixed-methods study with a sequential exploratory design (QUAL → quan) was used based on the philosophy of pragmatism.¹⁹ The philosophy of pragmatism emphasizes the application of ideas and practicing them in human experiences.¹³

Setting

The setting of this study was Isfahan city – a multicultural and metropolitan region in central Iran.

Qualitative Phase

Design

In this phase, women's experiences of breastfeeding empowerment were explored using conventional content analysis. Qualitative studies produce rich data with the purpose of gaining a full understanding of phenomena in natural contexts.^{20,21}

Sample

The participants were selected purposively using the following inclusion criteria: Iranian national, able to speak Farsi, having the experience of breastfeeding, willingness to participate in the study and sharing experiences. Those participants who were unwilling to continue participation at any stage of the study were excluded.

Eventually, 18 women were selected among those who referred to healthcare centers and hospitals. Maximum variation in sampling was considered in terms of age, number of children, type of childbirth, successful or failed breastfeeding, education and employment. It helped to achieve a variation in the phenomena under study and guarantee the credibility of research.

In addition, the findings of the study guided the researchers to invite key family members and healthcare staff for taking part in interviews using the snowball sampling method. Key family members were selected according to the findings of the women's perspectives. Also, we selected healthcare staffs who were actively involved in counseling and/or planning for breastfeeding services including breastfeeding consultant in the healthcare center, pediatrician, pediatric nurse, midwife, and children's health policymakers.

Data Collection

All interviews were conducted in Farsi. The time and location of the interviews were proposed by the participants. The goals and general rules were explained at the beginning of the interview sessions. The researcher started the interviews using the following general question: "Please describe your breastfeeding experiences". The participants' answers were followed by more questions. The interviews lasted 30–95 minutes and were tape-recorded. The nonverbal reactions of the participants were also noted for future analysis. Sampling and data collection continued until the researcher felt that no new data were collected to enhance the variations of findings.

Data Analysis

Data collection and analysis were performed simultaneously. The data were analyzed using conventional content analysis based on the Hsieh and Shannon's approach. For this purpose, the unit of analysis and preliminary codes were determined. Next, the codes were classified and compared to identify subcategories and main categories as the main products of data analysis.²²

Quantitative Phase

Design

Data analysis in the qualitative phase led to development of a practical educational-supportive family-centered empowering program for breastfeeding. This program was confirmed by experts using the Delphi technique. Strategies for promoting breastfeeding empowerment

were extracted from the results of the qualitative phase and a thorough literature review, and then prioritized by experts. Those strategies with the highest scores were used for designing the program. Subsequently, a randomized clinical trial was used to implement the program. This study was a single blind clinical trial for research samples in 2 intervention and control groups.

Sample

The intervention and control groups were selected out of pregnant women who referred to the 2 selected comprehensive health centers. We selected pregnant women who met the inclusion criteria and, based on their referral on different days of the week (odd and even days), randomly assigned them to the control (routine care) or intervention (family-accompanied education and counseling) groups.

The inclusion criteria were primiparous and singleton pregnancy, age over 18 years, low-risk pregnancy, 32–36 weeks of gestational age, ability to complete the questionnaires, and willingness to participate in the research.

Contraindications to breastfeeding in the postpartum period such as prematurity and failure to complete the study led to exclusion of samples.

The sample size was determined using the following equation:

$N = (Z_1 + Z_2)^2 2s^2 / d^2$ with the power of the study at 80%, type I error at 5% and $d = 0.7$ according to the results of a study in Korea.⁷ In addition, assuming 10% attrition, the sample size was determined to be 35 people in each group.

Intervention

In the intervention group, 2 two-hour small-group breastfeeding education sessions were held for each woman with her key family members. The educational content was designed based on the findings of the qualitative study and included the benefits of breastfeeding, appropriate techniques for breastfeeding, prevention and treatment of problems in breastfeeding, mother's milk expression and storage, increasing mother's milk and nutrition during pregnancy and postpartum period, caring for the child, and family's collaboration and support for breastfeeding. Teachings were in the form of lectures, discussions, simulation, educational software and booklet. At the end of each session, the researcher answered the questions from the mother and family members and gave them a manual and software about breastfeeding. Next, 3–5 days after childbirth, the researcher held one breastfeeding counseling session for the mother, her husband and key family members. The researcher was certified for lactation consultation and was responsible for the education and counseling sessions. Also, the participants were encouraged to call the researcher at any time in case of needing support without any constraints. The control group received

routine care and education consisting of one education session about breastfeeding during pregnancy.

Measurement

In the quantitative phase, a questionnaire was developed for data collection based on the qualitative study. The questionnaire's content validity was assessed by 15 experts. It collected data regarding the women's demographic information, childbirth condition and exclusive breastfeeding. Also, it included 45 questions on a 5-point Likert scale (from "absolutely agree" to "absolutely disagree") in 7 areas of mothers' breastfeeding empowerment. The score ranged from 45 to 225. To confirm the instrument's reliability, the intra cluster correlation (ICC) was calculated and reported to be 0.91 (95% CI= 0.87, 0.95; $P < 0.001$). Moreover, the internal reliability was evaluated using the Cronbach's alpha coefficient based on a pilot study with 30 individuals, which was reported to be 0.91.

Data Collection

Women's breastfeeding empowerment was evaluated using a researcher-made questionnaire 2 weeks, 2 months and 4 months after childbirth in both groups.

Statistical Analysis

Statistical analysis was performed using Stata version 16 for Windows (Stata Corp., College Station, TX, USA). Demographic variables were compared between the intervention and control groups using the independent t test, Mann-Whitney test and chi-square test. Independent t test and paired t test were applied to compare the mean score of total breastfeeding empowerment and its 7 areas in the intervention and control groups at 2 weeks, 2 months and 4 months after delivery. In addition, we used chi-square test to compare exclusive breastfeeding between the 2 groups at the same target points. The significance level of P value was <0.05 .

Results

Since we used a mixed-methods study with a sequential exploratory approach, the results are presented in 2 parts as follows: first, the results of the qualitative phase with the purpose of describing the experiences of breastfeeding empowerment in women and identifying associated factors; and second, the results of the quantitative stage with the aim of identifying the impact of the educational-supportive family-centered program on breastfeeding empowerment from the perspectives of the women.

Results of the Qualitative Phase

In this phase, 33 individual interviews and 2 group discussions were held. Of 39 participants, the age range of 18 individuals was 22–37 years. They lived in Isfahan and already had a history of caring for 1–3 mature or premature

infants from a few days to 47 months. The majority of them had high school education, were housewives and mostly had one child (Table 1). Five key family members were also interviewed, including 2 fathers and 3 grandmothers. Also, 16 interviews were held with the healthcare staff of breastfeeding counseling services. The staff mostly had more than 10 years of work experience and a Bachelor's degree more than 1500 codes were found during the data analysis of 39 interviews. The reduction process continued until categories and subcategories were developed. Three main categories describing women's breastfeeding empowerment were developed: "adequate knowledge and skills about breastfeeding", "overcoming breastfeeding problems" and "perception of family support for breastfeeding" (Table 2).

Adequate Knowledge and Skill about Breastfeeding

We found "adequate knowledge and skill about breastfeeding" to be a factor in developing breastfeeding empowerment. Also, "acquiring knowledge and practical skill about breastfeeding" and "ability of breastfeeding self-assessment" were the cornerstones of breastfeeding empowerment.

Acquiring Knowledge and Practical Skill of Breastfeeding

The participants stated that breastfeeding empowerment was developed through acquiring knowledge and practical skill about breastfeeding. Access to adequate information,

familiarity with the benefits and practical skills of breastfeeding and its techniques played key roles in breastfeeding. It was taught practically to mothers during pregnancy and before starting breastfeeding. Moreover, healthcare staff should observe how mothers breastfeed a few days after childbirth and rectify mistakes. A mother stated, "Teaching the correct method of breastfeeding during pregnancy, such as how to hold the child, helped me a lot so I could breastfeed easily."

Ability of Breastfeeding Self-assessment

Another factor was "ability of breastfeeding self-assessment". If the mother was able to properly assess the breastfeeding status, she could apply solutions in case of low milk supply and look for help. They thought that the mother's familiarity with lactogenic foods and complementary medicine methods such as acupuncture influenced breastfeeding continuance and empowerment. A mother said, "Teaching methods for increasing the mother's by the healthcare staff really improved my breastfeeding and helped me to breastfeed appropriately."

Overcoming Breastfeeding Problems

The women emphasized "overcoming breastfeeding problems" and stated that "knowledge and skill for preventing and solving breastfeeding problems", "self-efficacy for solving breastfeeding problems" and "feeling of adequacy for breastfeeding" led to breastfeeding empowerment.

Knowledge and Skill for Preventing and solving Breastfeeding Problems

From the participants' perspective, breastfeeding problems, especially in the first week postpartum, were common and threatened breastfeeding continuance. Therefore, overcoming these problems is required for breastfeeding empowerment. Mothers with the knowledge and skill for preventing and solving common breastfeeding problems are more prepared to face and solve related problems. Therefore, they recommended that mothers should be adequately educated during pregnancy about how to

Table 1. Sample Characteristics of 18 Mothers Interviewed About Breastfeeding

Characteristic	No. of Women
Age (y)	
20-30	9
31-40	9
Education	
Primary school	4
High school	4
Higher	10
Number of babies	
1	10
2	4
3	4
Employment	
Employed	4
Housewife	10
Student	4
Method of delivery	
Spontaneous vaginal delivery	10
Elective caesarean	5
Urgency caesarean	3
History of breastfeeding (month)	
1-12	6
13-24	5
25 or higher	7
Breastfeeding status	
Successful	14
Failed	4

Table 2. Empowerment in Breastfeeding from the Participant's Perception

Main category	Sub-category
Adequate knowledge and skill about breastfeeding	Acquiring knowledge and practical skill of breastfeeding
	Ability of breastfeeding self-assessment
Overcoming breastfeeding problems	Knowledge and skill for preventing and solving breastfeeding problems
	Self-efficacy for solving breastfeeding problems
	Feeling of adequacy for breastfeeding
Perception of family support for breastfeeding	Perception of the husband's support for breastfeeding
	Family's participation in the breastfeeding process

prevent common breastfeeding problems. A mother said, *“I have already read a book about the right method of putting the breast in the baby’s mouth. Also, I was taught in the hospital that the areola should be completely placed inside the baby’s mouth to avoid sore nipples; so, I do not have any problem.”*

Self-efficacy for Solving Breastfeeding Problems

The mother might act more empowered when she feels self-efficacious for solving breastfeeding problems, remains patient and calm when faced with problems, trusts her own ability to handle breastfeeding problems, tries to solve problems and never surrenders to problems. Mothers should be referred to healthcare centers when facing breastfeeding problems. They believed that breastfeeding counseling services should be delivered around-the-clock. Also, the 24-hour telephone counseling service played a supportive role for mothers and helped them adapt to breastfeeding. A mother said, *“In the first week after childbirth, I suffered from severe breast hyperemia and was afflicted by milk fever, and I was treated with help and advice from a breastfeeding counselor.”*

Feeling of Adequacy for Breastfeeding

The participant’s perspective of their empowerment was related to the feeling of adequacy for breastfeeding; thus, the women’s assurance of the infant’s adequate growth and health was one of the key aspects of breastfeeding empowerment. Also, the women’s worries about the adequacy of milk in terms of quantity and quality, uncertainty about the infant’s adequate growth, inability to meet the infant’s needs and assessing milk adequacy for the infant’s growth hindered maternal empowerment. Along with teaching the methods of assessing milk adequacy to mothers, the child growth chart should be evaluated and interpreted on every visit so that the mother would be ensured that her milk is adequate for the infant’s growth and health. A mother said, *“I thought that my milk supply was low and didn’t meet my child’s needs. They measured her weight and height, and assessed her growth process. It gave me peace of mind.”*

Perception of Family Support for Breastfeeding

From the participants’ perspectives, family support facilitated breastfeeding empowerment such that the women considered successful breastfeeding related to “perception of husband’s support for breastfeeding” and “family’s participation in the breastfeeding process”.

Perception of the Husband’s Support for Breastfeeding

The women highlighted the vital role of the husbands in supporting breastfeeding. Also, the husband’s participation in taking care of the child and the breastfeeding process, as well as empathy and involvement in solving breastfeeding problems helped the women to adapt to multiple roles.

In this respect, keeping positive relationships and marital interactions were key factors in successful and continuous breastfeeding. The husband’s belief and faith in breastfeeding and encouraging the mother to breastfeed supported breastfeeding. A mother said, *“During the first month after childbirth, the child needs to be greatly taken care of; my husband and family were of great help, especially because I had no experience with my first child. So, I was less tired and could breastfeed more easily.”*

The participants stated that the father’s presence beside the mother for taking care of the infant improved breastfeeding. They also noted that the spouse had a key role in increasing the mother’s resistance to others’ false beliefs. Informing the spouse regarding the common beliefs about breastfeeding in the society and taking care of the infant is a significant factor in breastfeeding support.

Family’s Participation in the Breastfeeding Process

In the first days after childbirth, Iranian family members provide support and help the mother with childcare. Therefore, they play an important role in the breastfeeding process such that their presence beside the mother not only has a supportive role, but also shares their experiences and helps the mother to adapt with breastfeeding. On the other hand, they may share their positive or negative experiences of breastfeeding. The participants recommended that healthcare centers should become aware of the experiences of these key individuals during pregnancy and regularly instruct them to contribute to early initiation and continuation of breastfeeding. The family and friends play a key role in continuing breastfeeding, if they have appropriate knowledge, attitude and skills about breastfeeding. A mother said, *“What the healthcare staff taught my husband and mother about the benefits and effects of breastfeeding and how they should support and help me in breastfeeding were really helpful.”*

Results of the Quantitative Phase

Drawing on the results of the qualitative phase, an empowerment program was designed, implemented and evaluated in the quantitative phase. The aim of the clinical trial study was to explore the impact of the educational-supportive family-centered program on breastfeeding empowerment from the perspectives of those women who were referred to Isfahan healthcare centers in 2015. Of 73 women who initially entered the study, 3 mothers in the control group left the study at the end of the fourth month. Therefore, the data collected from 70 women who were equally divided to the groups were used for data analysis. The average age was 27.2 ± 3.7 years 27.7 ± 3.9 years in the intervention and control groups, respectively. The 2 groups did not show significant differences in terms of childbirth method, gender of infant, education degree, job, age and receiving education for breastfeeding in the hospital (Table 3).

Table 3. Demographical Characteristics of Mother in the Intervention and Control Groups

		Intervention Group, No. (%)	Control Group, No. (%)	P Value
Childbirth method	NVD	20 (57)	15 (43)	0.075
	C/S	15 (43)	20 (57)	
Gender of infant	Female	13 (37)	15 (43)	0.377
	Male	22 (63)	20 (57)	
Education degree	Middle school or lower	4 (11)	4 (12)	0.370
	High school diploma	8 (23)	5 (14)	
	Some college or more	23 (66)	26 (74)	
Job	Housewife	23 (66)	30 (86)	0.125
	Clerk	12 (34)	5 (14)	
Age (y)		27.2 ± 3.7	27.7 ± 3.9	0.601
Husband Age (y)		31.37 ± 4.68	31.70 ± 3.67	0.739
Breastfeeding education in the hospital (min)		24.28 ± 23.82	21.84 ± 22.40	0.09

Two weeks after childbirth, the total mean scores of breastfeeding empowerment were 199.8 ± 20.6 and 174.5 ± 22.3 in the intervention and control groups, respectively, showing a statistically significant difference ($P < 0.001$). Moreover, the total mean scores of breastfeeding empowerment were significantly higher in the intervention group at 2 weeks, 2 months and 4 months after childbirth, indicating that the program improved the mean score of breastfeeding empowerment after childbirth. The intervention group also showed a significant increase in the mean scores of the 7 areas of breastfeeding empowerment including knowledge, attitude and skill of breastfeeding, skills of preventing and solving breastfeeding problems, breastfeeding adequacy, negotiation and gaining the family's support and breastfeeding self-efficacy at 2 weeks and 2 and 4 months after childbirth (Table 4).

Changes in the total mean scores of breastfeeding empowerment were not significantly different in each of the 2 groups at 2 weeks, 2 months and 4 months after childbirth, indicating that breastfeeding empowerment was developed and established 2 weeks after childbirth. Moreover, at the end of the second week and 2 months, the rates of exclusive breastfeeding were 66% and 94% in the control and intervention groups, respectively, which were significantly different ($P = 0.003$). The results also showed a statistically significant difference in exclusive breastfeeding at the end of the fourth month after childbirth (86% in the control and 66% in the intervention group; $P = 0.044$).

The extent of family's support for breastfeeding was also compared between the groups 2 weeks after childbirth, yielding 53% in the control group and 77% in the intervention group. Also, a statistically significant difference was reported between the groups in terms of family support and participation of the families in mothers' breastfeeding.

Discussion

This is the first mixed-methods study on breastfeeding empowerment in Iran. In the qualitative phase, the main categories were presented and mixed with the results

of literature review. The participants in the qualitative study described breastfeeding empowerment in 3 aspects: "adequate knowledge and skill about breastfeeding", "overcoming breastfeeding problems" and "perceiving family's support for breastfeeding". The educational-supportive family-centered program covered all these aspects.

The participants believed that "acquiring knowledge and practical skills about breastfeeding" developed breastfeeding empowerment such that mothers' access to adequate information and practical breastfeeding skills and familiarity with the proper techniques of breastfeeding led to successful breastfeeding. These techniques should be taught during pregnancy. The findings of the clinical trial showed that those pregnant mothers who participated in breastfeeding education sessions on the importance of breastfeeding, proper techniques of breastfeeding, how to express and store mother's milk, prevention of common breastfeeding problems, lactogenic foods, caring for the infant, and family support and participation in breastfeeding were empowered with significantly higher mean scores at 2 weeks, 2 months and 4 months after childbirth. Breastfeeding empowerment was developed and established 2 weeks after childbirth; therefore, empowerment should be established during pregnancy and in the first 2 weeks after childbirth. Kang et al reported similar results in South Korea. Breastfeeding empowerment played an important role in promotion of breastfeeding such that increased breastfeeding empowerment enhanced exclusive and continuous breastfeeding.⁷ Ong et al also showed that mothers have inadequate knowledge of the different aspects of child care including breastfeeding skills, and need to learn more about it.²³

The participants also highlighted the role of knowledge and belief in breastfeeding. They stated that being aware of the benefits of breastfeeding for health are important factors in breastfeeding empowerment. For instance, if the mother believes in breastfeeding, she tries to acquire the necessary breastfeeding knowledge and skills for adapting with breastfeeding difficulties and problems. The

Table 4. The Mean Score of the Total Breastfeeding Empowerment and its 7 Areas in the Intervention and Control Groups at 2 Weeks, 2 and 4 Months After Delivery

	2 Weeks			2 Months			4 Months					
	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)	Difference (95% CI)	P Value	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)	Difference (95% CI)	P Value	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)	Difference (95% CI)	P Value
Total breastfeeding empowerment	199.80 ± 20.62	174.50 ± 22.35	-25.30 (-35.36, -15.23)	<0.001	204.86 ± 16.64	183.14 ± 23.00	-21.71 (-31.24, -12.19)	<0.001	206.24 ± 17.35	188.51 ± 21.41	-17.72 (-27.14, -8.30)	<0.001
Knowledge	21.42 ± 2.30	19.15 ± 2.26	-2.27 (-3.33, -1.20)	<0.001	21.14 ± 2.72	18.97 ± 2.13	-2.17 (-3.32, -1.01)	<0.001	21.50 ± 3.20	18.91 ± 2.13	-2.58 (-3.88, -1.28)	<0.001
Attitude	27.25 ± 2.91	25.31 ± 3.32	-1.94 (-3.40, -0.47)	0.010	28.45 ± 2.40	25.47 ± 3.83	-2.98 (-4.50, -1.46)	<0.001	28.35 ± 2.52	26.14 ± 3.05	-2.21 (-3.55, -0.86)	0.002
Skills of proper breastfeeding technique	50.25 ± 9.93	42.15 ± 7.83	-8.09 (-12.25, -3.93)	<0.001	49.88 ± 4.40	45.66 ± 6.44	-4.21 (-6.83, -1.59)	0.002	50.82 ± 4.08	47.25 ± 5.90	-3.56 (-6.01, -1.11)	0.005
Skills of preventing and solving breastfeeding problems	24.82 ± 3.57	20.31 ± 4.54	-4.51 (-6.43, -2.59)	<0.001	26.25 ± 3.27	21.80 ± 3.99	-4.45 (-6.18, -2.71)	<0.001	26.67 ± 3.19	23.17 ± 3.83	-3.50 (-5.20, -1.80)	<0.001
Breastfeeding adequacy	17.42 ± 2.35	15.23 ± 2.92	-2.19 (-3.43, -0.94)	0.001	18.31 ± 1.98	16.44 ± 2.43	-1.86 (-2.92, -0.81)	0.001	18.11 ± 2.18	16.54 ± 2.86	-1.57 (-2.80, -0.34)	0.013
Negotiation and gaining the family's support	26.08 ± 3.98	23.57 ± 3.80	-2.50 (-4.32, -0.68)	0.008	27.57 ± 2.98	24.63 ± 3.36	-2.93 (-4.43, -1.42)	<0.001	26.82 ± 3.56	24.57 ± 3.64	-2.25 (-3.98, -0.51)	0.012
Breastfeeding self-efficacy	31.88 ± 3.51	27.92 ± 4.04	-3.96 (-5.74, -2.18)	<0.001	32.65 ± 2.82	28.83 ± 3.98	-3.82 (-5.46, -2.18)	<0.001	32.85 ± 3.21	30.45 ± 4.16	-2.39 (-4.18, -0.60)	0.009

findings of the clinical trial showed that family-centered education about breastfeeding during pregnancy had benefits for the mother, infant, family and society health. The Islamic perspective on breastfeeding is that Islam and the Quran recommend mothers to breastfeed their child up to the age of 2 years.²⁴ The mother-infant bonding and attachment significantly increased the breastfeeding empowerment score and enhanced exclusive breastfeeding in the intervention group at 2 weeks, 2 months and 4 months after childbirth. The results of other studies also show that mother's faith and belief, as well as knowledge of breastfeeding benefits had a great impact on her decision to breastfeed and raised the likelihood of breastfeeding initiation and continuance.^{25,26}

From the participant's perspectives, mother's skills and ability to utilize proper breastfeeding techniques, self-assessment of the breastfeeding status and use of proper milk-increasing strategies were key factors in breastfeeding empowerment. They underscored the importance of counselors' support for breastfeeding in the first days of childbirth and stated that practical breastfeeding instructions were vital in the first days of breastfeeding and played a key role in reinforcing the self-efficacy of women to continue breastfeeding. As for the quantitative study, the education of proper breastfeeding techniques during pregnancy using simulation, holding family-centered breastfeeding counseling sessions after childbirth, observing mother's breastfeeding techniques and rectifying mistakes, and analyzing the breastfeeding status significantly increased mothers' empowerment for exclusive breastfeeding. In Hall and Hauck's study, the participants stated that accurate information and practical instructions about breastfeeding were helpful.²⁷ In addition, the results of Azhari et al showed that teaching proper breastfeeding techniques enhanced women's self-efficacy and exclusive breastfeeding.²⁸

In addition, in the qualitative phase, the participants believed that overcoming breastfeeding problems improved breastfeeding empowerment. Also, knowledge and skills of preventing and solving breastfeeding problems and self-efficacy were important factors in breastfeeding empowerment. They also highlighted the necessity of access to breastfeeding counselors to receive practical instructions for solving problems in the first days after childbirth, so that mothers easily adapted to breastfeeding. Accordingly, in the quantitative study, education about the prevention and treatment methods of breastfeeding problems during pregnancy, were presented to the women using educational software and booklets. In breastfeeding counseling sessions, 3-5 days after childbirth, the questions and concerns of mothers and families and the collaborative role of the family were discussed. Also, the participants had access to the researcher at any time for more advice, if required. Two weeks, 2 months and 4 months after childbirth, the mean scores of empowerment

showed significant improvement in the intervention group. These findings were in line with the results of other studies indicating that support for mothers in treating breastfeeding problems was the principal reason for breastfeeding success and empowerment.^{23,29,30} Powell et al also argued that providing information about breastfeeding problems in educational sessions or clinical visits led to mothers' greater empowerment and preparedness.³¹

Moreover, according to the qualitative phase, the feeling of breastfeeding adequacy, as one of the main aspects of breastfeeding empowerment, depended on certainty about infant's adequate growth and receiving positive feedbacks from family and friends. Informing women about the signs of breastfeeding adequacy and analysis of these signs by healthcare personnel in each visit improved breastfeeding empowerment. In the quantitative phase, removing false beliefs about breastfeeding, education about the maternal and infant needs and how to assess the child growth process after childbirth improved breastfeeding adequacy in the intervention group at 2 weeks, 2 months and 4 months after childbirth. These findings were in line with the results of Olang et al who argued that a main reason for interrupted exclusive breastfeeding was mothers' concern about the inadequacy of their milk to fulfill their infant's needs.¹² In a meta-analysis by Nelson, mothers' concerns about their ability to lactate adequately and the quality of milk to meet their child's needs were emphasized.³²

The findings of the qualitative study showed that the husband played a key role in supporting breastfeeding. Also, the husband's participation in the process improved the experience of breastfeeding by mothers and increased the likelihood of successful breastfeeding. Mothers' multiple tasks and inadequate preparedness to take care of themselves and their infants make them exhausted and confused. If husbands take on a fraction of these tasks, mothers will have the opportunity to rest, feed and breastfeed. The participants also stated that postpartum pain and problems hindered taking the role of childcare, indicating the necessity of the family's presence to the mother and child care. In addition, due to early discharge from the hospital and lack of breastfeeding counseling, family members are actively present for supporting and deciding about the infant's nutrition. Also, the mother needs an empowered family who can support the child in the breastfeeding process. The participants suggested the supportive role of the family in breastfeeding and the participation of families in healthcare and breastfeeding educational classes. Also, it was said that family participation should be facilitated, the healthcare center should become aware of the experiences of key family members to contribute to early initiation and continuation of breastfeeding, and educational-supportive packages for mothers and families should be provided. The findings of the clinical trial also showed that educating the husband and key family members and their participation

in breastfeeding counseling sessions, as well as addressing their questions and concerns, improved breastfeeding empowerment and exclusive breastfeeding. Moreover, the rate of family support for mother's breastfeeding was 45% higher in the intervention group. These findings were in agreement with other studies indicating that the social support of the family and friends during pregnancy and after childbirth was of great importance to mothers. Also, the presence of key family members in clinical visits was a factor for continuing breastfeeding, which should be highlighted by caregivers.^{31,32}

Strengths and Limitations

This research highlights the aspects of women's breastfeeding experiences and provides new insight on breastfeeding counseling. The relatively small sample size and reflecting the perspectives of a limited number of women limit the generalizability of this study to all women. The randomization method was one of the shortcomings of the study (e.g. lack of block permuted randomization). However, we employed various methods to increase rigor and transferability of the result to similar communities. The questionnaire of women's breastfeeding empowerment was designed based on the qualitative phase of this study. This questionnaire covered all areas of breastfeeding empowerment and can be used by future studies.

In conclusion, this study showed that in addition to the mother and father, the family is a key component of breastfeeding empowerment. Therefore, it should be instructed for empowering women in breastfeeding. Key family members should be chosen according to the mother's opinions. In addition, proper breastfeeding techniques should be taught practically and visually during pregnancy, so that the mother and her family become fully prepared for breastfeeding before the birth of the infant. Breastfeeding techniques should also be taught practically after childbirth in the presence of the family. Also, in joint sessions, their problems should be addressed. In addition, the mother and her family need around-the-clock support and care for successful breastfeeding. This support can be provided over the phone or virtual services. Moreover, breastfeeding empowerment should be attempted and established 2 weeks after childbirth. Empowering programs should be implemented prior to this period during pregnancy and in the first 2 weeks after childbirth.

Authors' Contribution

ZH conceptualized, designed and managed the study; collected the data analysis; wrote the manuscript. SH collaborated in conceptualized and designed the study; collaborated in quality control; approved the manuscript. MK collaborated in conceptualized the study; collaborated in quality control. FM edited and critically reviewed the manuscript.

Study Highlights

- Breastfeeding empowerment can improve the continuance of breastfeeding.
- To empower women for breastfeeding, the mother, father and key family members should be educated using practical and visual teaching techniques during pregnancy and postpartum period.
- Since breastfeeding empowerment is established 2 weeks after childbirth, empowering programs should be implemented prior to this period for promoting breastfeeding.

Conflict of Interest Disclosures

The authors have no conflicts of interest.

Ethical Statement

The ethics committee affiliated with Medical Sciences University in which the authors worked approved the research (Decree code: 297006). It was also registered in the Iranian Registry of Clinical Trials (identifier: [IRCT2015081723657N1](https://doi.org/10.1186/1745-7214-6736(05)17872-6)). In addition, after explaining the goal and method of the research, written informed consent was obtained from the participants.

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