



Research article

Investigating the influence of family-oriented counselling on breastfeeding continuity in mothers experiencing distractions: A randomized controlled trial

Elahe Arezi^a, Azam Maleki^{b,*}, Elham Jafari^a^a School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran^b Social Determinants of Health Research Center, Health and Metabolic Diseases Research Institute, Zanjan University of Medical Sciences, Zanjan, Iran

ARTICLE INFO

Keywords:

Technology
Breast feeding
Counselling
Women's health services

ABSTRACT

The prevalence of distraction among breastfeeding mothers is on the rise, primarily attributed to the escalating use of media technologies. This study aimed to assess the influence of family-oriented counselling on the continuity of breastfeeding in mothers experiencing distractions. This randomized controlled trial included 120 eligible lactating mothers who accessed postpartum services at comprehensive health centers in Zanjan, a city in northwest Iran from August 21, 2022 to May 10, 2023. Participants were assigned to two groups through block randomization with a block size of four. The intervention group received Family-Oriented Counselling in three sessions at weekly intervals, and the control group received standard postpartum care. The study measured outcomes using the Maternal Distraction Questionnaire and breastfeeding patterns before, monthly, and up to 4 months after counselling. Data analysis employed statistical methods, including the Chi-square test, independent *t*-test, repeated measures ANOVA, and the Kaplan-Meier method, with a significance level set at $P < 0.05$. The results showed that the continuation of exclusive breastfeeding was 33 (55 %) in the intervention group and 21 (35 %) in the control group. This difference was statistically significant ($p = 0.001$). The reduction in distraction scores over time was more pronounced in the intervention group compared to the control group. The between-group effect was found to be statistically significant with an eta effect size of 0.73 ($p = 0.001$). In conclusion, the study suggests that the implementation of a family-centered intervention was effective in promoting the continuation of breastfeeding and reducing maternal distractions both during breastfeeding and non-breastfeeding activities. This approach proves to be a valuable step in enhancing the health of both mother and child. The findings underscore the importance of considering such interventions in health policymaking.

1. Introduction

Exclusive breastfeeding, which entails feeding a child only breast milk for the initial 6 months of life, provides essential psychological and immunological advantages for mother and their infants [1]. Despite the many benefits of exclusive breastfeeding, some

* Corresponding author. Safa St., Behind the Building of Shafiyeh Specialized Clinic, Social Determinants of Health Research Center, Health and Metabolic Diseases Research Institute, Zanjan University of Medical Sciences, Zanjan, 4515613191, Iran.

E-mail addresses: arezi.eli@gmail.com (E. Arezi), malekia@zums.ac.ir, malekia41@yahoo.com (A. Maleki), ejafari@zums.ac.ir (E. Jafari).

<https://doi.org/10.1016/j.heliyon.2024.e30687>

Received 19 February 2024; Received in revised form 1 May 2024; Accepted 2 May 2024

Available online 3 May 2024

2405-8440/© 2024 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

mothers may stop before the recommended duration or introduce unnecessary fluids and extra feeding [2]. Recognizing exclusive breastfeeding as the best standard in infant nutrition is influenced by multiple factors. Understanding these influences is valuable for devising strategies to prevent early discontinuation of exclusive breastfeeding [3,4].

In today's society, media technologies have become seamlessly integrated into daily life, providing a constant flow of information, entertainment, and social interaction. More than 88 % of the Iranian population aged 10–65 are social media users. The primary reasons for using social media include communication with others (48.9 %), staying informed with news (40.7 %), and browsing the internet (40.6 %) [5]. Several studies have highlighted the benefits of using smartphones or mobile phone apps for promoting health, exchanging health information, and aiding in patient screening, control, and management [6,7]. Mobile applications are a common tool for mothers caring for their babies to access parenting information and enhance breastfeeding practices [8]. mHealth interventions like SMS and smartphone apps could be valuable tools to enhance standard clinical care for preventing and treating postpartum depression [9]. Prolonged smartphone use has been shown to negatively impact users' physical health and psychosocial well-being, potentially leading to addiction and dependence [10,11]. The growing use of technology poses risks, with new mothers experiencing increased levels of parenting stress as their usage of social media, especially Facebook, increases [12]. Parental distraction by smartphones in the presence of infants is also linked to negative outcomes for a child's social-emotional functioning and breastfeeding [13–15].

Golen et al.'s in the United States, reported a 52 % prevalence of distraction among mothers with children under 6 months, with the most common distraction being TV watching. Distraction occurred at least once during breastfeeding in 83 % of cases, and technological distraction was noted in 78 %. The study found a significant correlation between mothers' distraction and parity and age, with higher distraction levels in multiparous and older women. However, mothers' distraction did not show a significant relationship with mothers' education, gender, or the child's weight [16].

Maintaining focus during breastfeeding is vital for milk production, effective milk transfer, nurturing the mother-baby bond, and promoting a positive breastfeeding experience. However, media technologies can sometimes interfere with this important aspect [17].

Family-centered care, a contemporary approach used in areas such as medicine, nursing, and midwifery, emphasizes the significance of engaging family members. Family-centered care training focuses on preparing a chosen family member with specific skills and knowledge to enhance support for another family member [18]. In family-centered intervention, education is tailored to consider the strengths, abilities, and needs of all family members. Primary evidence suggests that family-centered education, particularly in the realms of pregnancy and childbirth, is effective in dispelling mothers' misconceptions about milk sufficiency [19,20]. Certainly, contradictory findings have been documented. Shinta Kristianti et al. demonstrated that there was no significant relationship between social support from both family and health workers and exclusive breastfeeding [21].

Certainly, family-oriented counselling has been selectively employed to enhance breastfeeding outcomes, albeit to a limited extent [22,23]. Information on the effectiveness of interventions to reduce distractions from media technologies in breastfeeding mothers is limited. Breastfeeding is crucial for child development, making it important to develop interventions that can help lactating mothers stay focused and continue breastfeeding. This study aimed to evaluate the impact of family-oriented counselling on breastfeeding continuity among mothers facing distractions.

2. Materials and methods

2.1. Study design and research setting

This randomized controlled trial involved 120 eligible lactating mothers who sought postpartum services at comprehensive health centers in Zanjan city from August 21, 2022 to May 10, 2023. The eligibility criteria comprised mothers aged 18 or older, within two weeks to 42 days postpartum, cohabiting with a spouse, practicing exclusive or combined breastfeeding, and having at least one instance of media distraction as indicated by a Maternal Distraction Questionnaire. Additionally, participants needed to be residents of Zanjan and express a willingness to participate in the research. Inclusion criteria for newborns involved being born without medical or obstetrical complications, full-term, and capable of breastfeeding. Family members (preferably husbands) needed to have at least basic literacy, provide consent for participation in counselling sessions, and collaborate with lactating mothers at home. Exclusion criteria included bottle feeding, restrictions on breastfeeding (including medication use by the mother), and the presence of any condition in either the mother or baby that impedes the continuation of breastfeeding.

The sample size, calculated using the results from Su and Ouyang's study [24] for the variable of breastfeeding continuity ($P1 = 0.51$, $P2 = 0.26$, $Z1-\alpha = 1.96$, $\beta = 0.20$, $\alpha = 0.05$), initially determined as 54 individuals in each group with a 10 % dropout rate, was adjusted to 60 people in each group to account for potential dropouts.

2.2. Participant recruitment

Sampling was conducted from all 21 comprehensive urban health centers in Zanjan City. The researcher spent at least two weeks in each center. Lactating mothers were selected during routine postpartum care visits and then assigned to two groups using block randomization with a block size of four. This process involved two allocations to the intervention group (AA) and two allocations to the control group (BB) within each block, resulting in a total of six modes. Blocks of four were determined using a random number table to ensure that each group had a sample size of 60 individuals.

The blocking process was carried out by an individual not involved in the sampling. Random sequences, generated for each block, were documented on cards and sequentially placed inside envelopes. The envelopes were sealed and positioned within a box. At the

intervention’s commencement, the researcher opened an envelope, revealing the assigned group for that participant (Fig. 1).

2.3. Intervention

The control group received standard postpartum care. In Iran, similar to many other countries, breastfeeding education programs are taken immediately after childbirth in a hospital. Postpartum routine care in health centers included three visits in 3, 15, and 40 days after birth. The main counselling topics included personal hygiene, breastfeeding, immunization, use of vitamins, examinations related to postpartum hemorrhage or infections, baby care, family planning, and nutrition. The intervention group received three additional visits after enrollment. The intervention was conducted in three face-to-face sessions with the participation of at least one family member, preferably the spouse, based on a protocol similar to that of comparable studies [20,25]. In this study, the participant’s spouse provided support during all counselling sessions. The women in this research found great benefits in implementing strategies with their husbands to minimize disruptions during breastfeeding and infant care. Husbands can help minimize distractions during breastfeeding by creating a peaceful environment, such as designating a quiet space and turning off loud devices. They can also assist with household chores to reduce the partner’s workload. Providing emotional support is crucial, especially in reducing smartphone use. Encouraging bonding activities and establishing a feeding routine together can strengthen the parent-infant bond. Open communication about the importance of reducing smartphone use during feeding is key. The meetings lasted between 45 and 60 min, with sessions held at one-week intervals. There was no attrition in the study and after the interventions. Details of the counselling session content are outlined in Table 1.

2.4. Data collection tools

The primary outcome of the study was the continuation of breastfeeding and the secondary outcome was the amount of distraction of the mothers, which was measured before and then monthly until 4 months after the end of the counselling sessions using the Maternal Distraction Questionnaire and the breastfeeding pattern was measured by the World Health Organization classification.

2.4.1. Demographic characteristic

Demographic characteristic was collected through a questionnaire, encompassing details such as age, education, occupation, number of children (parity), age and education of the spouse, type of delivery, and the baby’s gender.

2.4.2. Maternal distraction questionnaire (MDQ)

The MDQ is a self-report questionnaire developed by Golen and Ventura, comprising 18 questions designed to assess various

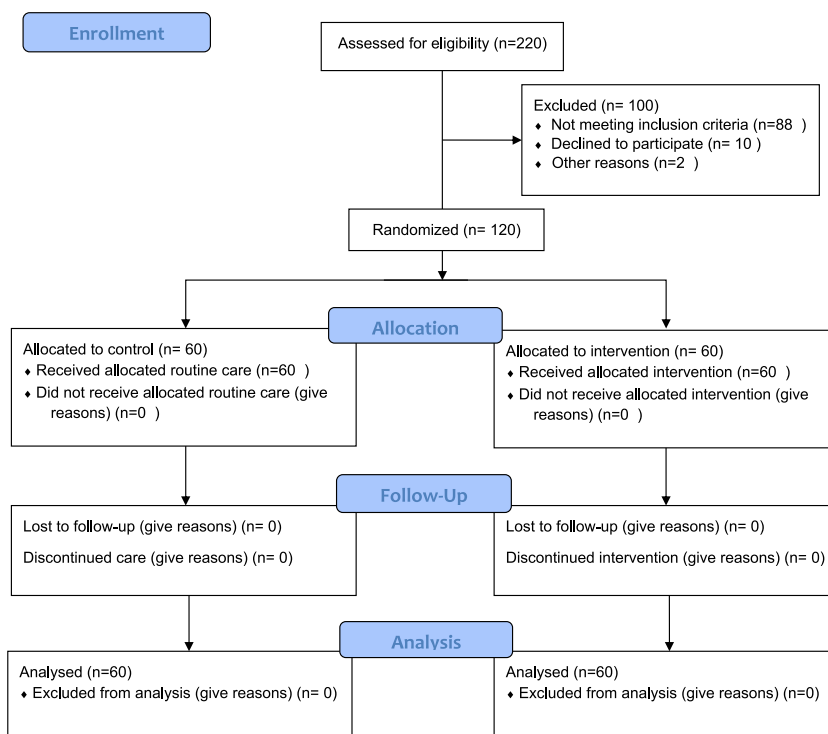


Fig. 1. The process of participant enrolment.

Table 1
The content of counselling sessions [20,25].

Session	Content	Example father activity
The first session	<ul style="list-style-type: none"> - The consultant and client get acquainted, establishing a comfortable rapport. - Objectives, scheduling, and meeting logistics are discussed in detail to ensure alignment. - Exploring attitudes towards media and its impact on daily life, followed by specific techniques for managing technology-related distractions. - Discussing the crucial role of eye contact in breastfeeding for both mother and baby's health, with practical exercises to emphasize its significance. - Highlighting the pivotal role of the family in supporting healthy behaviours, with a focus on cultural nuances and sensitivity. - Assessing family involvement in baby care and support for lactating mothers, promoting open dialogue to address cultural expectations and dynamics - Delving into the health benefits of breastfeeding and factors influencing its continuation, with culturally tailored advice and strategies. - Providing detailed guidance on proper breastfeeding techniques and addressing common challenges, supplemented by interactive role-playing exercises. 	<p>Encourage fathers:</p> <p>To create a peaceful space for breastfeeding by designating a quiet corner or room</p> <p>To keep the environment quiet by turning off loud devices or appliances</p> <p>To take on household chores to reduce your partner's workload, allowing her to focus on breastfeeding without distractions.</p> <p>To take over phone calls or messages to allow your partner uninterrupted time with the baby feeding.</p> <p>To Provide emotional support especially if mothers find it challenging to reduce smartphone use, by reassuring them and encouraging them to prioritize the bonding experience during feeding times.</p> <p>To engage in bonding activities with the baby, such as eye contact, skin-to-skin contact, and reading to the baby to strengthen the parent-infant bond and reduce the need for smartphone distractions.</p> <p>Encourage open communication between parents about the importance of reducing smartphone use during feeding interactions and work together to find strategies that support this goal effectively</p>
The second session	<ul style="list-style-type: none"> - Identifying external and internal distractions affecting mothers, followed by hands-on activities to recognize and manage distractions effectively. - Introducing practical strategies such as mindfulness techniques and time management skills, supplemented by interactive exercises and role-playing scenarios. - Facilitating open discussion on the importance of family support in minimizing distractions during baby care, with opportunities for participants to share their experiences and insights. - Monitoring family involvement in supporting lactating mothers, with culturally relevant resources and contact numbers provided for further support outside of counselling sessions. - Equipping mothers with a distraction booklet to track and manage distractions, supplemented by culturally sensitive resources and support networks. - Reviewing common breastfeeding challenges and offering culturally appropriate solutions, with a focus on understanding and addressing cultural influences on breastfeeding practices- 	
Third session	<ul style="list-style-type: none"> - Encouraging participants to share innovative approaches to reduce distractions during breastfeeding and childcare, fostering a collaborative environment for idea-sharing and problem-solving. - Establishing commitment to distraction reduction strategies through personalized pledges or agreements, tailored to individual cultural backgrounds and preferences. - Recapitulating session content and addressing any outstanding concerns, with opportunities for open discussion and reflection. - Ensuring ongoing family support for baby care and feeding, with culturally sensitive guidance provided to address any challenges or concerns. - Revisiting breastfeeding challenges and offering additional advice, with culturally tailored resources and support networks provided for ongoing assistance. - Providing mothers with new distraction notebooks and reviewing progress, supplemented by ongoing support and guidance tailored to cultural consider- 	

activities mothers engage in during interactions with their babies. The initial section of the questionnaire focuses on the frequency of common maternal activities during breastfeeding and baby care. These activities encompass watching TV, talking on the phone or texting, using the computer, and reading a magazine. The scoring of each question was based on a 5-point Likert scale, ranging from 1 (never) to 5 (always). The second parts consist of two questions evaluating the level of attention or distraction exhibited by mothers during feeding interactions and other caregiving moments. The distraction queries employ a 5-point Likert scale ranging from 1 (not at all distracted) to 5 (completely distracted). Additionally, there is a question assessing the degree of the mother's attention to the baby during feeding or non-breastfeeding caregiving, rated on a 5-point Likert scale from 1 (not much attention) to 5 (very careful attention). Ventura assessed the reliability of the questionnaire, reporting a Cronbach's alpha of 0.86 for technology activities and 0.84 for non-technology activities. The internal correlation coefficient was also noted as 0.86. These values indicate a high level of internal

consistency, suggesting that the questionnaire reliably measures the intended constructs [26]. The Persian version of the questionnaire was utilized in this study. The internal consistency of the entire instrument was confirmed with a Cronbach's alpha coefficient of 0.75 [27].

2.4.3. The continuation of breastfeeding

The study used the World Health Organization's system to evaluate breastfeeding continuation, which categorizes feeding practices into five levels based on the proportion of breast milk and formula used [28]. To better understand breastfeeding patterns in this study, a simplified three-level classification system was implemented: Exclusive breastfeeding, Mix, and bottle feeding.

2.5. The data analysis

The data analysis was conducted using SPSS version 16 software. Demographic characteristics between the two groups were compared using the Chi-square test and Fisher's exact test. The normality of data distribution was assessed using the Kolmogorov-Smirnov test, confirming a normal distribution. The independent *t*-test was used for quantitative variables. To examine the impact of time and group on average distraction, repeated measures ANOVA was employed. Survival analysis, specifically the Kaplan-Meier method, was used to assess the continuation of exclusive breastfeeding. The significance level for all analyses was set at $P < 0.05$, indicating statistical significance.

3. Results

3.1. The baseline data

The findings regarding the demographic characteristics of the participants revealed several key points. The majority of individuals in both groups were aged 25 to 34 and a university education. They were mainly homemakers with Multiparous parity. The gender ratio of the infants leaned towards males, with a significant number delivered via cesarean section. Regarding the partners' characteristics, the age bracket of partners in both groups ranged from 30 to 39. Nevertheless, the educational background varied between the intervention and control groups, with a greater proportion of partners in the intervention group holding a university degree, whereas in the control group, a larger percentage had a diploma. Before the intervention, more than 36 % in the intervention group and 41 % in the control group had exclusive breastfeeding. It is noteworthy that the comparison of demographic variables between the two groups did not reveal any statistically significant differences (p -value < 0.05) based on the data presented in [Table 2](#).

3.2. The distracting activities

The study compared the level of distracting activities among mothers during baby feeding in the pretest and 4th month follow-up periods. Results indicated that mothers in the intervention group were frequently engaged in distracting activities, particularly before the intervention, ranging from sometimes to most of the time. However, after the intervention, the frequency of distractions decreased significantly, with activities such as using a computer, talking on the phone, texting, using mobile apps, and reading non-digital

Table 2
Comparison of frequency of demographic characteristics between two groups.

		Intervention n (%)	Control n (%)	P value
Age (year)	19–24	15 (24.6)	16 (26.2)	0.361
	25–34	34 (55.7)	27 (44.3)	
	35–44	12 (19.7)	18 (29.5)	
Education	Elementary - Middle School	19 (31.1)	14 (23)	0.590
	High School -Diploma	20 (32.8)	23 (37.7)	
	University	22 (36.1)	24 (39.3)	
Occupation	Employed	11 (18)	12 (19.7)	0.817
	Housewife/Self-Employee	50 (82)	49 (80.3)	
Parity	1	27 (44.3)	26 (42.6)	0.855
	More than 1	34 (55.7)	35 (57.4)	
Type of delivery	NVD	22 (36.1)	18 (29.5)	0.440
	CS	39 (63.9)	43 (70.5)	
Baby sex	Male	38 (63.3)	31 (51.7)	0.196
	Female	22 (36.7)	29 (48.3)	
Spouse's age (year)	22–29	9 (14.8)	11 (18)	0.385
	30–39	43 (70.5)	36 (59)	
	40–47	9 (14.8)	14 (23)	
Spouse's education	Elementary - Middle School	18 (29.5)	14 (23)	0.503
	High School -Diploma	20 (32.8)	26 (42.6)	
	University	37.7 (23)	21 (34.4)	
Breastfeeding pattern	Mixed	38 (63.3)	31 (51.7)	0.196
	Exclusive breastfeeding	22 (36.7)	29 (41.3)	

materials showing a shift from never to rarely. This suggests that mothers in the intervention group reduced their engagement in distracting activities during feeding sessions (Fig. 2).

The study's findings regarding distracting activities of mothers during breastfeeding and baby care demonstrated a noteworthy trend. The average overall score of mothers' activities exhibited a substantial decrease from 45.86 during the pre-consultation stage to 26.47 by the end of the 4-month follow-up period. Interestingly, the reduction in the average overall score was more pronounced in the intervention group compared to the control group.

Mauchly's test indicated that the assumption of sphericity, reflecting the adequacy of the samples, was satisfied in both the intervention and control groups (p -value = 0.001). The overall analysis of distraction levels over time revealed statistically significant differences. The effect size, indicated by eta, was substantial at 65 %, signifying that changes over time significantly influenced the dependent variable, with a consistent decrease over the studied period. Moreover, the interaction effect between time and group was also statistically significant, with an eta effect size of 17 %. This implies that the impact of time on the dependent variable varied between the intervention and control groups. Specifically, the reduction in distraction scores over time was more pronounced in the intervention group compared to the control group.

Finally, the between-group effect was found to be statistically significant with an eta effect size of 0.73. This indicates that irrespective of time variations, there were significant differences between the groups concerning the dependent variable. Notably, the intervention had a substantial impact, reducing distraction scores by 73 %. The p -value, indicating the significance of these results, was less than 0.001, further supporting the robustness of these findings (Table 3).

The results of the pairwise comparison of the mean difference in mothers' distraction, utilizing Bonferroni's post hoc test by groups. Significant differences were found in various months for both the intervention and control groups. In the intervention group, there were significant differences in distraction levels between different periods, except for the second-third and second-fourth months ($p < 0.05$). However, in the control group, there were significant differences in all months except for two pairs ($p < 0.05$). The intervention consistently reduced distraction scores in the intervention group over time (Table 4).

3.3. Continuation of exclusive breastfeeding

The results showed that the continuation of exclusive breastfeeding was 33 (55 %) in the intervention group and 21 (35 %) in the control group. This difference was statistically significant. The log-rank test was also used to compare the differences between the groups. The difference in survival time between the groups was statistically significant (Table 5).

More than 98 % of mothers in both groups had started exclusive breastfeeding from the first day after delivery. Although the drop in exclusive breastfeeding can be seen in several periods after delivery, the biggest drop in exclusive breastfeeding in the counselling group was on day 115 and in the control group on day 105 (Fig. 3).

3.4. Effect of distraction scores on exclusive breastfeeding

In this study, distraction scores were utilized as a covariate and the effect of distraction scores on exclusive breastfeeding was analyzed through the analysis of covariance. After considering the predictors, the Corrected Model showed the Type III Sum of Squares was 11061.757, and the F -value was 49.136, which was statistically significant with a p -value of 0.001. The Partial Eta Squared value of 0.457 indicates that 45.7 % of the variance in the breastfeeding variable is explained by the predictors in the mode. The distraction variable, when included in the analysis as a covariate, showed a substantial effect on breastfeeding continuity, as evidenced by its

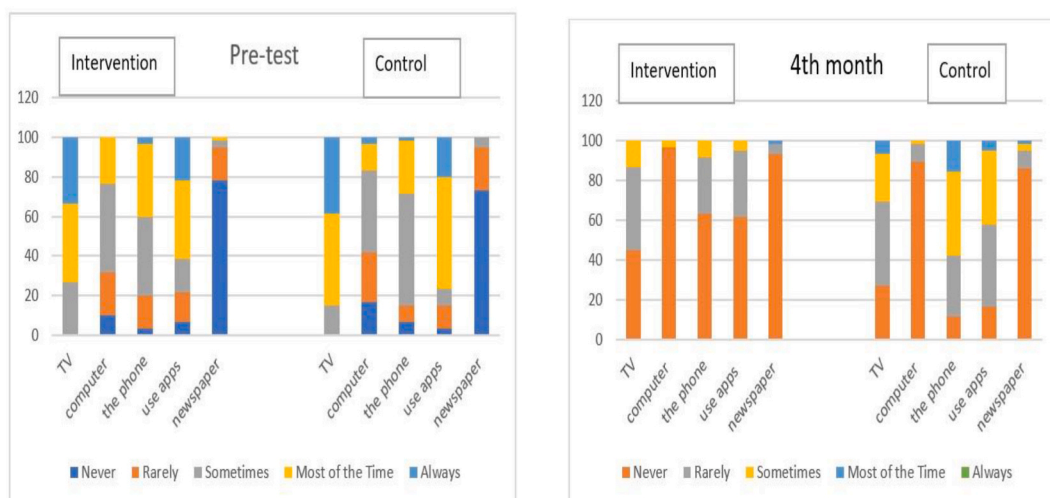


Fig. 2. The percentage of distracting activities during the feeding of the baby in two time periods (pretest and 4th month follow-up periods).

Table 3

Comparison of repeated measure test results mean scores of the maternal distraction in two study groups.

	Mean \pm SD (before)	Mean \pm SD (follow up 1)	Mean \pm SD (follow up 2)	Mean \pm SD (follow up 3)	Mean \pm SD (follow up 4)	Repeated measure test		
						Within- subject	Between- group	Time ^a group
Intervention	45.98)6.24)	29.06)5.22)	26.54)5.30)	26.00)4.21)	26.43)3.63)	F = 220.363	F = 23.998	F = 309.412
Control	47.33)6.54)	40.41)7.71)	39.93)5.22)	36.23)3.18)	35.15)2.68)	P = 0.001	P = 0.001	P = 0.001
P-value	0.250	0.001	0.001	0.001	0.001	Eta = 0.65	Eta = 0.73	Eta = 0.17

* Independent t-student, SD: Standard deviation; *Independent Test.

^a ANOVA (Analysis of variance) with repeated measures, Mauchly's Test of Sphericity (Mauchly's W = 0.26, p = 0.001), Wilks' Lambda (Value = 0.187, F = 121.02, p = 0.001, Partial Eta Squared = 0.81).**Table 4**

Pairwise Bonferroni comparison changes in the mean score of the maternal distraction at different times in two groups.

Group	(1) time	(2) time	M D	SE ^a	P value	95 % Confidence Interval for Difference			
						Lower Bound	Upper Bound		
Intervention	Pre	1	16.74	1.34	0.001	12.83	20.65		
		2	19.32	1.36	0.001	15.33	23.31		
		3	19.89	1.24	0.001	16.27	23.52		
		4	19.39	1.18	0.001	15.92	22.85		
	1	2	2.57	0.44	0.001	1.27	3.87		
		3	3.15	0.41	0.001	1.93	4.37		
		4	2.64	0.43	0.001	1.37	3.91		
		3	0.57	0.32	0.794	-0.36	1.51		
	2	4	0.068	0.37	1.000	-1.01	1.15		
		4	-0.50	0.23	0.336	-1.19	0.17		
		Control	Pre	1	7.21	1.01	0.001	4.25	10.17
				2	7.86	0.82	0.001	5.45	10.26
3	11.68			0.80	0.001	9.32	14.04		
4	12.82			0.90	0.001	10.18	15.46		
1	2		0.64	1.19	1.000	-2.84	4.13		
	3		4.47	1.12	0.002	1.18	7.75		
	4		5.61	1.10	0.001	2.40	8.82		
	3		3.82	0.74	0.001	1.65	5.99		
2	4		4.96	0.80	0.001	2.60	7.32		
	4		1.14	0.54	0.404	-0.44	2.72		

^aStandard error.^bMean Difference.**Table 5**

The Kaplan-Meier survival time of exclusive breastfeeding in two groups.

group	Total N	N of Events	Censored		Estimate	SE ^a	Log Rank
			N	Percent			
Intervention	60	27	33	55.0 %	111.083	1.534	Chi-Square = 9.18 P value = 0.002
Control	60	39	21	35.0 %	101.533	1.902	
Overall	120	66	54	45.0 %	106.308	1.297	

^a Standard Error.

significant Type III Sum of Squares (8325.682), high F-value (73.965, $p < 0.001$). The Partial Eta Squared value of 0.387 for the distraction variable indicates that it explains a considerable portion (38.7 %) of the variance in breastfeeding continuity. This suggests that distraction scores play a meaningful role in predicting exclusive breastfeeding outcomes when considering other predictors in the model. The predictor "group" had a Type III Sum of Squares of 1794.432 and a significant F-value of 15.942 ($p < 0.000$). The Partial Eta Squared value of 0.120 indicates that this predictor explains 12 % of the variance in the dependent variable.

4. Discussion

The study was conducted to determine the effect of family-oriented counselling on the continuation of breastfeeding in women with distraction. The study results indicated a statistically significant difference in the continuation of exclusive breastfeeding between the intervention group and the control group (55 % vs. 35 %). Our study findings are consistent with Ke J et al., 's 2015 research conducted in China. In their study, two sessions of family-focused breastfeeding education during pregnancy, along with three home visits and

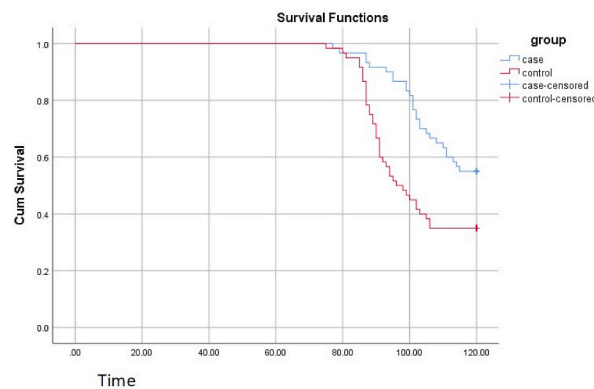


Fig. 3. The comparison of the survival time of breastfeeding continuation between two groups.

eight postpartum phone calls, notably boosted the likelihood of exclusive feeding in the intervention group. The odds of exclusive feeding were increased by 44 % compared to the control group. Moreover, the intervention group demonstrated a greater improvement in awareness levels over time compared to the control group. Notably, the positive effects of family-oriented support persisted in the intervention group during the 1-6-month follow-up [25]. While the overall cultural contexts between Iran and China may differ, the effectiveness of the intervention might suggest that family-oriented breastfeeding support could be a universally beneficial approach.

In a study by Kohan et al., in 2017, introducing two sessions of family-oriented education during pregnancy and one session of family-oriented counselling in the first week post-delivery led to an increase in the average score of breastfeeding sufficiency. The test group also showed higher rates of exclusive breastfeeding continuation at both the two-week and two-month intervals compared to the control group [20]. Another study by Kohan et al. in Isfahan (2016) found that two weeks after childbirth, the control group had higher breastfeeding self-efficacy scores than the intervention group [22]. In a study by Sakkaki et al. the implementation of home visit programs was found to be effective in promoting the continuation of exclusive breastfeeding for six months following cesarean delivery. Moreover, the rate of sustained breastfeeding was notably higher in mothers who received support from their spouse, mother, or mother-in-law [29]. Despite variations in research populations, the results of the mentioned studies align with the findings of the present study. This suggests that the implementation of family-oriented interventions, particularly in women experiencing distraction while feeding the baby, proves to be effective in improving breastfeeding outcomes. The efficiency of these interventions is evident in their ability to provide breastfeeding support counselling by healthcare workers, aiding in the decision to initiate breastfeeding, addressing challenges during breastfeeding, and optimizing infant feeding practices [30]. In the context of breastfeeding, family-oriented interventions, including counselling, prove effective by involving and educating family members, thereby creating a supportive environment that enhances successful breastfeeding practices [19].

The current study's results revealed a 73 % reduction in the scores measuring mothers' activities during breastfeeding or baby care as a result of the intervention. The literature review indicated a scarcity of studies investigating the effectiveness of family-centered counselling in reducing distraction among lactating mothers. Notably, a comparable study was not found. In the study conducted by Tomfohrde et al., in 2016, it was revealed that over 90 % of mothers engage in social media or email usage while breastfeeding. Notably, 28 % of women reported using social media or email "full time" during breastfeeding. The primary reasons cited for utilizing social media during breastfeeding included efforts to "stay awake," not paying attention to the passage of time to allow the baby enough time to feed with breast milk, overcoming discomfort during breastfeeding, searching for news, and finding information about breastfeeding and baby care [31].

In a longitudinal study conducted by Lotte Muskens and colleagues in 2024, it was found that the use of social media during pregnancy exhibited a consistent upward trend, with approximately 10.5 % of pregnant women likely being addicted to social networks. The study also revealed that primiparous women tended to spend more time on social media compared to multiparous women. However, equality in media usage between primiparous and multiparous women was observed only in the second trimester [11].

The use of media technology during activities such as breastfeeding varies among mothers due to cultural and social differences [16,27]. Working mothers may use media technology to stay connected to work or entertain their children. They may rely on video calls to check in with their colleagues or use educational apps to keep their kids engaged while they work [32]. In some cultures, breastfeeding is considered a private and intimate activity, often carried out in a separate space. In contrast, in other cultures, breastfeeding is more of a public activity, often done in the presence of others [33]. In these cases, the use of media technology during breastfeeding may be accepted and even encouraged as a means to stay connected and engage in social activities.

Additionally, over time and as social conditions change, the patterns of technology use may evolve. It's essential to recognize that mothers' attention and early interactions with their babies play a crucial role in shaping cognitive development, psychomotor abilities, and the creation of a safe environment for children [13]. When mothers use smartphones while breastfeeding, there is a noted decrease in their attention to their babies [17]. Women must strike a balance between technology use and quality time spent with their children. Using smartphones while feeding can diminish eye contact, impacting the establishment of a secure attachment between parent and child. Shared gaze is vital for ideal development, as infants depend on cues from the caregiver's facial expressions for a feeling of

security [34,35].

To foster the holistic development of healthy and intelligent children, parents should prioritize strong parent-child communication. This involves continuing breastfeeding for its health benefits and adopting a mindful approach to integrating technology into family life. Rather than hindering communication, technology should be seen as a supplementary tool. Parent-child communication forms the foundation for emotional bonds, cognitive development, and a supportive family environment. Breastfeeding, a key component, not only provides essential nutrients but also nurtures a secure bond between parent and infant. However, with the prevalence of smartphones, parents must be cautious about technology use during crucial interactions like breastfeeding. Balancing technology integration with quality parent-child communication involves establishing healthy usage habits, designating specific device-free times, and prioritizing focused interactions with children.

4.1. Limitations & strengths

The study represents the first randomized clinical trial conducted within Iranian culture aimed at reducing distractions for lactating mothers. Data collection employed a reliable tool with established psychometric properties. However, limitations include its exclusive focus on mothers within 42 days postpartum and reliance on self-report questionnaires, potentially impacting the generalizability of the results. The study's clinical trial design restricted the collection of qualitative data, limiting insights into participants' experiences. Future research should analyze the experiences of women receiving counselling to reduce distractions during breastfeeding to understand the effectiveness of such interventions on breastfeeding outcomes and maternal well-being.

5. Conclusion

In conclusion, the study suggests that the implementation of a family-centered intervention was effective in promoting the continuation of breastfeeding and reducing maternal distractions both during breastfeeding and non-breastfeeding activities. This approach proves to be a valuable step in enhancing the health of both mother and child. The findings underscore the importance of considering such interventions in health policymaking.

Ethics approval and consent to participate

This article was a part of the MSc thesis and approved by the Ethics Committee of the Vice Chancellor for Research of Zanjan University of Medical Sciences, Iran, with the approval number IR.ZUMS.REC.1401.136. All procedures of the study were following the protocol of the regional ethical research committee and with the declaration of Helsinki 1964. After informing the study's purposes, written consent was obtained from all women. They were informed that their participation was voluntary, confidential, and anonymous, and was apprised of their right to withdraw from the research at any time. (All of the women provided written informed consent).

Consent for publication

Not Applicable.

Funding

This article was part of MSc thesis and funded by the Research Deputy of Zanjan University of Medical Sciences, Iran, with the approval number (The code " A-11-344-29").

Trial registration

The study was registered at the Iranian Registry of Clinical Trials website under the code IRCT20150731023423N21. <https://irct.behdasht.gov.ir/user/trial/63595/view>.

Availability of data and materials

The datasets used during the current study are available from the corresponding author on reasonable request. Additionally, the dissertation datasets are available on the Zanjan University of Medical Sciences repository via this link: <https://repository.zums.ac.ir/cgi/search/simple>.

CRedit authorship contribution statement

Elahe Arezi: Writing – original draft, Software, Data curation, Conceptualization. **Azam Maleki:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Elham Jafari:** Writing – original draft, Methodology, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We would like to thank the Social Determinants of Health Research Center, Zanjan University of Medical Sciences, and the vice-chancellor of research and technology for their financial support to carry out the study. We would like to thank the Clinical Research Development Center of Ayatollah Mousavi Hospital, Zanjan University of Medical Sciences for their collaboration and computer advice.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2024.e30687>.

References

- [1] J.C. Muro-Valdez, et al., Breastfeeding-related health benefits in children and mothers: vital organs perspective, *Medicina* 59 (9) (2023) 1535.
- [2] M. Ranjbaran, et al., Prevalence of exclusive breastfeeding in Iran: systematic review and meta-analysis, *Epidemiol. Health Syst. J.* 3 (3) (2016) 294–301.
- [3] P.T. Mundagowa, et al., Determinants of exclusive breastfeeding among mothers of infants aged 6 to 12 months in Gwanda District, Zimbabwe, *Int. Breastfeed. J.* 14 (2019) 1–8.
- [4] R. Bajoulvand, et al., Predicting exclusive breastfeeding among Iranian mothers: application of the theory of planned behavior using structural equation modeling, *Iran. J. Nurs. Midwifery Res.* 24 (5) (2019) 323.
- [5] M. Chegeni, et al., Prevalence and motives of social media use among the Iranian population, *J. Environ. Public Health* (2022) 2022.
- [6] J. Zhao, B. Freeman, M. Li, Can mobile phone apps influence people's health behavior change? An evidence review, *J. Med. Internet Res.* 18 (11) (2016) e287.
- [7] J. Kim, et al., Depression screening using daily mental-health ratings from a smartphone application for breast cancer patients, *J. Med. Internet Res.* 18 (8) (2016) e5598.
- [8] C.M.M. Diniz, et al., Contributions of mobile applications on the breastfeeding practice: integrative review, *Acta Paul. Enferm.* 32 (2019) 571–577.
- [9] C. Zhou, et al., The effectiveness of mHealth interventions on postpartum depression: a systematic review and meta-analysis, *J. Telemed. Telecare* 28 (2) (2022) 83–95.
- [10] L. Li, T.T. Lin, Examining how dependence on smartphones at work relates to Chinese employees' workplace social capital, job performance, and smartphone addiction, *Inf. Dev.* 34 (5) (2018) 489–503.
- [11] L. Muskens, et al., Browsing throughout pregnancy: the longitudinal course of social media use during pregnancy, *Midwifery* 129 (2024) 103905.
- [12] M.K. Bartholomew, et al., New parents' Facebook use at the transition to parenthood, *Fam. Relat.* 61 (3) (2012) 455–469.
- [13] S. Myruski, et al., Digital disruption? Maternal mobile device use is related to infant social-emotional functioning, *Dev. Sci.* 21 (4) (2018) e12610.
- [14] M. Davidovitch, et al., The role of cellular phone usage by parents in the increase in ASD occurrence: a hypothetical framework, *Med. Hypotheses* 117 (2018) 33–36.
- [15] A.K. Ventura, S. Teitelbaum, Maternal distraction during breast-and bottle feeding among WIC and non-WIC mothers, *J. Nutr. Educ. Behav.* 49 (7) (2017) S169–S176. e1.
- [16] R.P. Golen, A.K. Ventura, What are mothers doing while bottle-feeding their infants? Exploring the prevalence of maternal distraction during bottle-feeding interactions, *Early Hum. Dev.* 91 (12) (2015) 787–791.
- [17] L.G. Nomkin, I. Gordon, The relationship between maternal smartphone use, physiological responses, and gaze patterns during breastfeeding and face-to-face interactions with infant, *PLoS One* 16 (10) (2021) e0257956.
- [18] H. Dalvand, M. Rassafiani, H. Bagheri, Family centered approach: a literature review, *Mod. Rehabil. J.* 8 (1) (2014).
- [19] P. Liu, et al., Effectiveness of a family-centered behavioral and educational counselling approach to improve periodontal health of pregnant women: a randomized controlled trial, *BMC Oral Health* 20 (1) (2020) 1–11.
- [20] S. Kohan, Z. Heydari, The effect of family-oriented educational-supportive programs on adequacy of exclusive breastfeeding from the perspective of mothers, *J. Babol Univ. Med. Sci.* 19 (3) (2017) 53–58.
- [21] N. Masruroh, N.Z. Istanah, Family support for increasing exclusive breastfeeding, *J. Aisyah: J. Ilmu Kesehatan* 4 (1) (2019) 59–62.
- [22] S. Kohan, et al., Promoting breastfeeding empowerment in primiparus women: effect of family-center education and support, *Daneshvar Med.* 24 (125) (2016) 51–58. <https://www.sid.ir/paper/30401/en>.
- [23] S. Kristianti, S. Pratamaningtyas, The family support and provider support to increase exclusive breastfeeding coverage, *Health Notions* 2 (1) (2018) 113–117.
- [24] M. Su, Y.-Q. Ouyang, Father's role in breastfeeding promotion: lessons from a quasi-experimental trial in China, *Breastfeed. Med.* 11 (3) (2016) 144–149.
- [25] J. Ke, Y.-Q. Ouyang, S.R. Redding, Family-centered breastfeeding education to promote primiparas' exclusive breastfeeding in China, *J. Hum. Lactation* 34 (2) (2018) 365–378.
- [26] A.K. Ventura, et al., Development and validation of the maternal distraction questionnaire, *Heliyon* 6 (2) (2020) e03276.
- [27] E. Arezi, A. Maleki, E. Jafari, The effect of media distractions on women during breastfeeding and infant care: a descriptive cross-sectional study, *Breastfeed. Med.* 19 (4) (2024) 90–284.
- [28] W.H. Organization, Indicators for Assessing Breast-Feeding Practices: Report of an Informal Meeting, 11-12 June 1991, World Health Organization, Geneva, Switzerland, 1991.
- [29] M. Sakkaki, M. Khairkhal, Promotion of exclusive breastfeeding: teaching good positioning and support from fathers and families, *Nurs. Midwifery J.* 10 (6) (2013).
- [30] M. Inoue, et al., Infant feeding practices and breastfeeding duration in Japan: a review, *Int. Breastfeed. J.* 7 (1) (2012) 1–15.
- [31] O.J. Tomfohrde, J.S. Reinke, Breastfeeding mothers' use of technology while breastfeeding, *Comput. Hum. Behav.* 64 (2016) 556–561.
- [32] S.J. Blithe, Mobile working mothers and the simultaneous shift, *Electron. J. Commun.* 25 (1) (2015).
- [33] C.M. Anderson, Negotiating Infant Feeding in Private and Public Spaces: a Study of Women's Experiences, University of Glasgow, 2010.
- [34] R. Hood, et al., "It helps and it doesn't help": maternal perspectives on how the use of smartphones and tablet computers influences parent-infant attachment, *Ergonomics* 67 (2) (2024) 148–167.
- [35] C. Inoue, Y. Hashimoto, M. Ohira, Mothers' habitual smartphone use, infants during breastfeeding, and mother–infant bonding: a longitudinal study, *Nurs. Health Sci.* 23 (2) (2021) 506–515.