

Breastfeeding versus Formula Feeding: Main Reasons and Determinants

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Abstract

Background: It is critical to identify the factors that influence mothers' decision to discontinue breastfeeding and use formula. The purpose of this study is to compare the characteristics of breast-fed and formula-fed subgroups in order to identify the factors influencing the discontinuation of exclusive breastfeeding in a group of Iranian infants.

Methods: The data of the two groups of women who fed their infants with breast milk (n = 275) or formula (n = 275) were gathered by the use of a questionnaire including questions regarding maternal demographics, breastfeeding-related problems, infant disorders, and factors that influence formula preference. Face-to-face interviews with the mothers of the children were used to obtain the questionnaire data by a trained interviewer. In SPSS version 22, descriptive and inferential statistics were used to analyze the data.

Results: Lack of weight gain (32.8 %), inadequate breast milk (51.3 %), return to work (9.1%), teething (0.7%), mothers' disorders (3.6 %), and infants' disorders (2.5 %) were the most common reasons for starting formula feeding. Physicians (34.5 % versus 21.5 %), health providers (26.5 % versus 30.5 %), health assistants (26.9% versus 26.7 %), and books (12.0 % versus 16.7%) are the main sources of information about the types of infantile feeding in the groups of mothers who use formula or breast-feeding, indicating a significant difference between the sources used by the two groups (p = 0.001).

Conclusion: Formula use is primarily motivated by two factors: apprehension over the insufficiency of breastfeeding and a lack of time to do so. As a result, comprehensive education for mothers about the necessary cases of formula feeding is critical.

Key Words: Breastfeeding, Exclusive nutrition, Formula feeding.

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1- INTRODUCTION

All infants should be breastfed; and breastfeeding should be started as soon as possible after birth and continued exclusively for up to 6 months (1, 2). Breast milk is the best milk for infants for a variety of reasons, including immune enhancement, psychological communication between mother and child, proportion of proteins and other nutrients for the baby, delivering adequate amounts of fat and fluid in primary and terminal milk, supplying most mineral requirements, constant availability, and proper temperature (3-5). Breastfeeding significantly reduces the prevalence of malnutrition, respiratory infections, and diarrhea, which are the leading causes of infant death (6). Breast feeding infants accompanies a lower risk of otitis media, meningitis and type 1 diabetes mellitus, as well as a better IQ (7, 8). According to previous research, 77 out of 1,000 formula-fed infants are admitted to the hospital during their first four months of life, compared to only 5 out of 1,000 breastfed infants (9). Breastfeeding exclusively reduces infant mortality and morbidity by three to five times (10). Formula feeding or the early commencement of supplemental feeding is dangerous for the baby and can interfere with breastfeeding and cause food allergies (11). Despite these benefits, many mothers want to cease breastfeeding for a variety of reasons or supplement it with excessive fluids and nourishments (12). In this regard, identifying the factors that influence breastfeeding is critical in order to lead breastfeeding promotion programs that focus on these causes in order to improve mothers' ability and willingness to breastfeed. Factors impacting lactation continuity come in a variety of forms. Infant restlessness, other people's recommendations, and the subjective feeling of infant milk deficiency are among the most important causes of breastfeeding discontinuity from the

perspective of mothers (13). As a result, the current study was designed to compare the characteristics of groups of mothers using breast and formula-feeding in order to establish the factors influencing the discontinuation of exclusive breastfeeding in infants referred to Shahrekord city health centers, Iran.

2- MATERIALS AND METHODS

This cross-sectional study was conducted on all mothers with newborns who were referred to Shahrekord health centers for vaccination from 2018 to 2019. After determining the sample size (550 people), Shahrekord Health Center provided us with a list of urban and rural Shahrekord city centers as well as their care-taking children aged less than one year. Given that if the questionnaires were distributed at random, the balance between breast-feeding and formula-feeding children might not be established, the sample size was divided into two equal groups of 275 people who were fed with breast milk or formula.

The data for the study were gathered using a questionnaire with 14 questions that included maternal demographic information, breastfeeding-related problems, and infant disorders factors; the questionnaire was utilized in previous studies (14). The psychometric analyses (item clarity, face validity, content validity and reliability coefficient calculation) were also performed on the instrument. In order to determine the face and content validity of the questionnaire, it was reviewed by five faculty members from Shahrekord University of Medical Sciences' Department of Pediatrics. According to their suggestions and comments, certain changes were made to the wordings and phrases of the items, and then the content of the instrument was found valid for gathering the data of interest. Content validity index and ratio were obtained over 0.79 and 0.59, respectively; and its reliability was calculated using the split-

half method, with a Cronbach's alpha coefficient of 0.82. The questionnaire includes 14 questions about maternal delivery, where they live, mothers' job status, age at pregnancy, mothers' education level, birth weight, type of infant feeding, time of starting supplement feed, reason for formula consumption, and factors that led the mother to breastfeed her infant by formula (such as recommendations of a physician or health professional, having diarrhea, colic, media otitis, respiratory diseases, etc.) and a history of being admitted to the hospital as an infant. The questions were then answered by eligible mothers who were referred to health centers for vaccination of their children and were willing to participate in the study. Face-to-face interviews with the mothers of the children were used to obtain the questionnaire data by a trained interviewer.

2-1. Inclusion and Exclusion criteria

Inclusion criteria included Iranian mothers with children aged 6 to 12 months, a clean medical record, and willingness to participate in the study. Mothers who did not complete the study's special questionnaire or who were unwilling to participate in the study were excluded.

2-2. Data Analysis

The data was described as mean, standard deviation (SD), and percentage. The Kolmogorov–Smirnov test was used to determine the normal distribution of data, based on which it was revealed that all data had a normal distribution. T-test was used to compare continuous variables, while the chi-square test was implemented to compare categorical ones. The statistical software IBM SPSS Statistics for Windows, Version 22 (Armonk, NY: IBM Corp.) was used for the analysis. Statistical significance was defined at a P-value of less than 0.05. Shahrekord Medical School Research Committee approved the

research plan after the ethical committee approved it (IR.SKUMS.REC.1396.6).

3- RESULTS

Purpose of the study was to look into the factors that influence the continuation of exclusive breastfeeding in Shahrekord health centers in 2018. In total, 550 consecutive infants referred to Shahrekord health centers were divided into two groups: breast-fed and formula-fed. Chi-square test was first used to analyze the data. Mode of delivery ($p=0.336$), region of residence as rural or urban areas ($p=0.322$), mothers' job status ($p=0.256$), pregnancy rate ($p=0.149$), and type of underlying disorders of the mothers ($p=0.144$) were similar in both formula-fed and breast-fed subgroups, as shown in **Table 1**; but maternal age at gestation was lower in the formula-fed group ($p=0.044$). In terms of infant characteristics, formula-fed infants had a lower birth weight ($p=0.041$).

The formula-fed mothers started supplement feeding earlier than the other mothers ($p=0.001$). Preterm birth was the most common underlying disorder in the formula-fed group ($p=0.001$). Furthermore, the rate of infant hospitalization was significantly higher in the formula-fed group ($p=0.001$). Physicians (34.5 % versus 21.5 %), health providers (26.5 % versus 30.5 %), health assistants (26.9% versus 26.7 %), and books (12.0 % versus 16.7%) were the main sources of information about the types of infantile feeding in the two groups of mothers, indicating a significant difference between the sources used by the two groups ($p=0.001$). In the group of formula feeding mothers, the suggested person to consume formula were physicians in 37.1%, friends in 17.8% and health providers in 17.8%, while the mothers themselves decided to use formula in 27.3 %. About 58.5 % of them began formula feeding when their infants were less than 3 months old, 35.0 % when they

were 3 to 6 months old, and 6.5% when they were 6 to 12 months old. Lack of weight gain (32.8 %), inadequate breast milk (51.3 %), return to work (9.1%),

teething (0.7 %), mothers' disorders (3.6 %), and infants' disorders (2.5 %) were the most common reasons for starting formula feeding.

Table-1: Comparing the characteristics of the mothers in breast-feeding and formula-feeding groups (n = 550)

Variable		Formula-feeding N (%)	Breast-feeding N (%)	P value
Mode of delivery	Cesarean section	133 (48.4)	127 (46.2)	0.336
	Normal vaginal	142 (51.6)	148 (53.8)	
Area of residence	Rural	65 (23.6)	70 (25.5)	0.322
	Urban	201 (76.4)	205 (74.5)	
Age at pregnancy	<18 years	28 (10.2)	11 (5.4)	0.044
	18 to 30 years	144 (54.9)	151 (54.9)	
	30 to 40 years	95 (34.5)	105 (38.2)	
	>40 years	8 (2.9)	8 (2.9)	
Mothers' education level	Illiterate	3 (1.1)	3 (1.1)	0.389
	Primary	11 (4.0)	9 (3.3)	
	Middle	25 (9.1)	29 (10.5)	
	Secondary	37 (13.5)	22 (5.8)	
	Diploma	103 (37.5)	98 (35.6)	
	Academic	96 (34.9)	114 (41.5)	
Job status	Employed	45 (16.4)	38 (13.8)	0.256
	Housewife	230 (83.6)	237 (86.2)	
Underlying disorders	Hepatitis	1 (0.4)	0 (0.0)	0.144
	Abscess	3 (1.1)	1 (0.4)	
	Depression	8 (2.9)	8 (2.9)	
	Hypertension	16 (5.8)	10 (3.6)	
	Infections	8 (2.9)	5 (1.8)	
	Endocrine	40 (14.5)	30 (10.9)	
	None	199 (74.0)	221 (80.4)	

4- DISCUSSION

The superiority of breast milk over formula is well known, but the need for additional assistance, as well as concerns about the inadequate composition of breast milk, leads people to seek refuge in the formula. Overall, the question of whether breastfeeding is always preferred to formula or, conversely, if formula can better suit the demands of the infant remains a point of contention. Breastfeeding is definitely superior to formula feeding, as demonstrated in the

current study, in terms of both infant and maternal outcomes.

We were able to obtain some significant results in this regard. First, we discovered that mothers with a lower gestational age and neonates with a low birth weight tended to use formula feeding rather than breastfeeding. It's possible that such mothers were concerned that their milk compounds were insufficient for their newborns, so they not only wanted to utilize formula, but also used it sooner. This was more noticeable among

premature infants and those who required hospitalization, particularly in the neonatal intensive care unit. Overall, the main

reasons for utilizing formulas were related to children's issues. Previous research has also yielded similar results.

Table-2: Comparing the characteristics of the infants in breast-feeding and formula-feeding groups (n = 550)

Variable		Formula-feeding N (%)	Breast-feeding N (%)	P value
Weight at birth	<1000 gr	5 (1.8)	0 (0.0)	0.041
	1000 to 1500 gr	7 (2.5)	9 (3.3)	
	1500 to 2000 gr	34 (12.4)	15 (5.5)	
	2000 to 2500 gr	89 (32.4)	82 (29.8)	
	>2500 gr	140 (50.9)	169 (61.5)	
Time of starting supplement feed	<6 months	186 (67.6)	141 (51.3)	0.001
	>6 months	89 (32.4)	134 (48.7)	
Underlying disorders	Cleft-palate	1 (0.4)	0 (0.0)	0.001
	Small chin	2 (0.7)	1 (0.4)	
	Colic	33 (12.0)	22 (8.0)	
	Prematurity	65 (23.6)	27 (9.8)	
	Metabolic	4 (1.5)	1 (0.4)	
	Mental retardation	0 (0.0)	1 (0.4)	
	Genetic disease	1 (0.4)	2 (0.7)	
	Respiratory	10 (3.6)	6 (2.2)	
	Otitis	8 (2.9)	7 (2.5)	
	None	151 (54.9)	208 (75.6)	
Rate of hospitalization	Yes	132 (48.0)	86 (31.3)	0.001
	No	143 (52.0)	189 (68.7)	

The most common reasons for formula supplementation, according to Pierro in 2016 (15), were a sense of insufficient milk production in one-third of mothers (36.4 %), a desire for sleep in one-third of mothers, and a plan to breast and bottle feed in the remaining one-third. They also discovered that being exclusively breastfed was linked to being a primiparous mother, having a higher education level, and having been breastfed as a child. Single marital status, mother's birth in the United States, Catholic religion, multiparity, and cesarean delivery were all linked to exclusive formula feeding. Maternal feeding habits were also influenced by religious and cultural considerations. In another study by Boban et al. (16), the most common maternal reasons for

supplementing were lack of milk followed by crying baby, cesarean section, newborn weight loss, and sore nipples. Of all the reasons given, 24.6 % were deemed medically acceptable. Another survey conducted by Gagnon et al., in 2005, (17) found that births between 7 PM and 9 AM, as well as high maternal trait anxiety increased the chances of using milk supplementation. Planning to exclusively breastfeed, planning to breastfeed for >or=3 months, childbirth education and completion of community college, male infant, and breastfeeding at delivery were also protective against supplementation. Exclusive breastfeeding methods were very low among mothers working in governmental and non-governmental organizations in the study area of a

research conducted in 2019 (18) by Tadesse et al.; as a result, it is mentioned that working mothers may be unable to breastfeed exclusively. Thus, a proper work environment for breastfeeding should be created, and information, education, and communication programs tailored to working mothers should be provided to encourage exclusive breastfeeding practices.

Overall, we now know that breastfeeding can successfully reduce the incidence of allergy and infectious disorders in infants, and that this advantage can be greater if breastfeeding is continued for a longer period of time (2, 19). Exclusive breastfeeding for at least 6 months is strongly advised around the world. In this regard, public health is actively focusing on lowering the use of formula during birth hospitalization in order to promote breastfeeding length (20).

Another critical issue is the primary but dependable source of information on the requirement or importance of utilizing formula in place of breast milk. Although physicians were the primary source of information about the relevance and kind of infantile feeding in both the formula-fed and breast-fed groups in our study, some parents turn to books and media, including non-scientific and unofficial sources. It appears that full training for mothers on the requirement of utilizing the formula or the dangers of its unintended use should begin even before pregnancy begins.

4-1. Limitations of the study

One of the limitations of this study could be the mothers' lack of participation, as well as the health centers' lack of cooperation; though the researcher has been describing the study's purpose in an attempt to justify and persuade the mothers to participate. Despite this, since a small number of mothers did not engage in the study and did not enter it, the results of the study were almost unaffected. It is

proposed that more prospective research be conducted. In future studies, it is also suggested that the baby's term and birth weight be taken into account as influencing factors in breastfeeding success.

5- CONCLUSION

The primary causes for using formula instead of breastfeeding, according to our research, are the lack of weight gain, insufficient breast milk, returning to work, early teething, mothers' disorders, and infants' disorders. In fact, formula use is primarily motivated by two factors: concerns about breastfeeding insufficiency and a lack of breastfeeding time. As a result, extensive education for mothers about the necessary causes of formula feeding is essential.

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