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Investigation of feeding characteristics of babies for 0-12 months: Aydın province sampling

Bebeklerin 0-12 ayda beslenme özelliklerinin incelenmesi: Aydın ili örneği

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Abstract

Purpose: Mothers' practices of complementary feeding and exclusive breastfeeding may differ relative to various factors. The objectives of this research were to investigate the mothers' practices of their babies' nutrition and the factors affecting them in the sample of Aydın province.

Materials and methods: The analytical and cross-sectional designed research was carried out in a total of 23 Family Health Centers in the Efeler district of Aydın province. The research sample consisted of 350 mothers with 12-24 months old babies. The research data was collected using data collection forms, which were filled out by face-to-face interviews with mothers after their verbal approval was obtained.

Results: The exclusive breastfeeding duration was 6 (0-9) months, and the time to start complementary feeding was 6 (4-10) months. The exclusive breastfeeding duration of babies of high school graduate mothers was shorter. Babies in extended families had longer exclusive breastfeeding duration, and there was a weak positive correlation between the numbers of family members and exclusive breastfeeding duration. Mothers with lower income levels started complementary feeding earlier, and mothers who started complementary feeding earliest were high school graduates among the education groups.

Conclusion: The research showed that the rate of starting complementary feeding early (30.6%) was not low, and mothers had insufficient knowledge about exclusive breastfeeding and appropriate complementary feeding practices. Therefore, training courses on baby nutrition should be given to mothers.

Key words: Breastfeeding, complementary feeding, infant, infant health.

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Öz

Amaç: Annelerin bebeklerini sadece anne sütüyle besleme süreleri ve tamamlayıcı beslenmedeki uygulamaları çeşitli etkenlere göre değişmektedir. Bu araştırmanın amacı, Aydın ili örneğinde annelerin bebek beslenmesindeki uygulamalarını ve bunları etkileyen faktörleri incelemektir.

Gereç ve yöntem: Analitik ve kesitsel tipteki araştırma, Aydın ilinin Efeler ilçesindeki toplam 23 adet Aile Sağlığı Merkezi'nde yürütülmüştür. Araştırma örneklemi, 12-24 aylık bebeği olan 350 anneden oluşmaktadır. Araştırma verileri, sözlü onamları alındıktan sonra anneler ile gerçekleştirilen yüz yüze görüşmelerde doldurulan veri toplama formları aracılığıyla toplanmıştır.

Bulgular: Bu araştırmada sadece anne sütüyle beslenme süresi 6 (0-9) ay ve tamamlayıcı beslenmeye başlama zamanı 6 (4-10) ay olarak bulunmuştur. Lise mezunu annelerin bebeklerini sadece anne sütüyle besleme süreleri daha kısaydı. Geniş aile yapısındaki bebeklerin sadece anne sütüyle beslenme süreleri daha uzundu ve ailedeki birey sayısı ile sadece anne sütüyle beslenme süresi arasında pozitif yönlü zayıf bir ilişki vardı. Daha düşük gelir düzeyine sahip anneler, tamamlayıcı beslenmeye daha erken başlamıştı ve öğrenim grupları arasında tamamlayıcı beslenmeye en erken başlayan anneler lise mezunlarıydı.

Sonuç: Bu araştırma, tamamlayıcı beslenmeye erken başlama oranının (%30,6) düşük olmadığını ve annelerin bebekleri için sadece anne sütüyle beslenme ve uygun tamamlayıcı beslenme konusunda yeterli bilgiye sahip olmadığını göstermiştir. Bu nedenle bebek beslenmesi konusunda annelere eğitimler verilmelidir.

Anahtar kelimeler: Emzirme, tamamlayıcı beslenme, tamamlayıcı besinler, bebek beslenmesi.

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Introduction

In the first two years of life, when growth and development are rapid, nutrition is crucial to ensure optimal growth and development and to prevent diseases. Malnutrition in this period can cause emotional and cognitive disorders, and developmental delay, which is difficult to correct later, and an increase in childhood diseases and mortality [1-3]. It was determined that the rates of childhood malnutrition in developing countries were high at the 6th month when complementary feeding (CF) started, and the main reason for this malnutrition was inappropriate CF practices [4].

According to the recommendation of the World Health Organization (WHO), babies should be exclusively breastfed for the first six months of life, and thereafter should receive appropriate CF with continued breastfeeding up to 2 years or beyond [5]. In CF the number of meals, and the amount and consistency of foods should be appropriate for the baby's age and should be sufficient to meet the baby's energy and nutrient requirements [6].

According to Turkey Demographic and Health Survey (TNSA) 2018 data, while the rate of exclusive breastfeeding (EBF) is 59% in 0-1 month-old babies, it decreases to 45% in 2-3 months old babies and 14% in 4-5 months old babies. Also, 40.7% of babies younger than 6-months-old were exclusively breastfed, and 11.8% of them were fed with complementary foods accompanied by breastfeeding [7]. In the study conducted by Ozkul Saglam et al. [8], it was found that the duration of EBF was 4.8±2.1 months, and the time to start CF was 5.7±1.2 months. In the study of Yesilcicek Calik et al. [9], it was determined that only 9% of mothers exclusively breastfed their babies for the first six months, while in the study of Gumustakim et al. [10], it was determined that 25.6% of babies started to receive complementary foods before the sixth month.

This research aimed to examine the (i) EBF duration, (ii) time to start CF, (iii) common CF practices in 0-12 months period, and (iv) factors affecting them.

The questions sought to be answered by this research were:

1.How long is the EBF duration?

2.When do mothers start CF for their babies?

3.What are the CF practices of mothers in the 6-8 months period and the 9-12 months period?

4.Do the mothers' descriptive characteristics affect their babies' nutrition?

5.Which are the factors affecting the mothers' practices in their babies' nutrition?

Materials and methods

Research design and participants

The analytical and cross-sectional research was carried out in a total of 23 Family Health Centers (from Center No.1 to Center No.24, excluding Center No.17) located in the Efeler district of Aydın province. Center No.17 was not included in the scope of the research, as it may cause difficulties both in obtaining permission and in researching within the institution since it is the Prison FHC and affiliated with the Ministry of Justice. According to the data of the Turkish Statistical Institute (TUIK) [11], the population of Aydın is 1.110.972. Efeler, which is the central district of Aydın, constitutes 26.45% of the total provincial population with a population of 293.816. Efeler district was chosen as the place where the research was carried out because it has people from various socio-economical classes that can reflect the Aydın sample, receives migration, and has a cosmopolitan structure.

The universe of this research consists of all mothers living in the Efeler district of Aydın province and having at least one 12-24 months old baby. Unlike the literature, this research was conducted with mothers with babies aged 12-24 months [1, 8, 12, 13]. With this, it was aimed to examine mothers' complementary feeding practices for their babies in the 0-12 months period separately as 6-8 months and 9-12 months periods. To make it easier for mothers to remember the correct answers to the questions in the data collection form regarding these practices, the upper age limit for the babies was determined as 24 months. The sample of this research was calculated using the sampling method for the unknown universe (by using $n=t^2pq/d^2$ formula). In this calculation, the rate of 30.1%, which is the rate of babies exclusively breastfed for the first six months according to TNSA 2013 data [14], was used.

The sample was found to be 323 mothers with 95% probability (α=0.05) and 0.05 deviation (d=0.05). By adding 10% missing probability to this calculation, the sample was determined as 350 mothers.

Inclusion criteria of mothers for this research were determined as being 18 years old or older, having at least one 12-24 months-old baby, being able to understand and speak Turkish, willing to participate in the research, and not having any physical or mental problem that may prevent communication and not having any chronic disease that may affect the baby's nutrition. In addition, the absence of any metabolic disorder in the 12-24 months old babies of the mothers participating in this research was another inclusion criterion. The exclusion criterion was the mother's willingness to leave the research at any stage of the research.

Data collection

A data collection form, which was prepared by the researcher to question the descriptive characteristics of mothers and their babies, and the practices of the mothers in their babies' nutrition, was used to collect the research data. It was prepared based on the literature [8, 10, 15]. The data collection form contains 7 questions about the descriptive characteristics of the mothers, 5 questions about the descriptive characteristics of their babies, and 18 questions about the mothers' practices in the nutrition of their babies, a total of 30 questions.

Between the dates 10 June and 20 December 2019, FHCs within the scope of the research were visited for collecting research data in order of number, starting from Center No.1, by the researcher. The researcher continued data collection for two working days between 8:30 a.m. and 5:30 p.m. for each FHC. After, all FHCs within the scope of the research were visited once, the data collection process was terminated when the research sample reached 350 mothers. During the researcher was in an FHC for data collection, mothers who applied to that FHC for various reasons were informed about the research. Then, volunteer mothers who met the inclusion criteria were included in the research by convenience sampling method after their verbal consent was obtained. The data collection forms were filled out by the researcher with mothers in face-to-face interviews in a suitable environment of the FHC. And it took approximately 10-15 minutes to fill out the forms. During the data collection process, 354 mothers who met the inclusion criteria were invited to the research, but 4 mothers were excluded from the research since they left the interview unfinished due to reasons such as their baby's discomfort after vaccination. Therefore, the research was completed with 350 mothers.

Statistical analysis

Statistical analysis of the obtained data was performed using the IBM SPSS Statistic 22 program. Descriptive statistics were presented as number and percentage, mean and standard deviation, or median and minimum-maximum values. The relation between quantitative variables was analyzed by Pearson Correlation analysis. The differences between mothers' practices in their babies' nutrition relative to the descriptive characteristics of mothers and their babies were analyzed with Mann- Whitney U Test, Kruskal-Wallis Test, and Post Hoc Test (Bonferroni) for quantitative data. And Chi-Square Test was used for comparisons between categorical data. In the evaluation of the results, the statistical significance level was accepted as $p<0.05$. The statistical significance level was analyzed as $p<0.01$ during the tests and as $p<0.001$ in some analyses.

Ethical considerations

This research was produced from a graduate study of the first author. For the graduate study, an application was made to the Aydın Adnan Menderes University Faculty of Health Sciences Non-Invasive Clinical Research Ethics Committee. The application file was examined with the protocol number 2018/67 at the meeting of the board on 06.02.2019, and pre-approval was given with decision number 7. After necessary documents were prepared, an application was made to Aydın Provincial Health Directorate, and the permission of Aydın Provincial Health Directorate dated 10.05.2019 and numbered 69836136-605.01 was obtained. The study was explained to the responsible physicians of FHCs visited for the study, and their approval was received. Likewise, other health workers in the FHCs were also informed about the study. After the study was completed, final approval for the research was obtained from the Aydın Adnan Menderes University Faculty of Health Sciences Non-Invasive Clinical Research Ethics Committee.

Results

The descriptive characteristics of the mothers, who participated in the research, and their babies are shown in Table 1. The mean age of 350 mothers included in this research was 29.72±4.584 (19-45) years, the number of children was 2 (1-7), and the number of family members was 4 (3-10). In this research, 38.0% of mothers were university graduates, 71.4% of them were unemployed, 61.1% of them had an income above minimum wage, and 98.3% of them had a nuclear family. The median age of the babies was 18 (12-23) months, median gestational age was 39 (26-43) weeks, median birth weight was 3200 g (870-4500), and median birth length was 50 cm (33-60). In this research, 54.3% of babies were born with cesarean section, and 57.1% of them were girls (Table 1).

Table 1. Descriptive characteristics of mothers and their babies (n=350)

Characteristics of Mothers	**Number (n=350)**	**Percentage (%)**
Education Level		
Illiterate	10	2.9
Primary School	46	13.1
Middle School	60	17.1
High School	93	26.6
University	133	38.0
Postgraduate	8	2.3
Employment Status		
Employed	100	28.6
Unemployed	250	71.4
Household Income		
Minimum wage and below	136	38.9
Above minimum wage	214	61.1
Family Structure		
Nuclear Family	344	98.3
Extended Family	6	1.7
	Mean/Median	**Standard deviation/Min-Max**
Age (year)	29.72	4,584
Number of Children*	2	1-7
Number of Family Members*	4	3-10
Characteristics of Babies	**Number (n=350)**	**Percentage (%)**
Birth Type		
Vaginal	160	45.7
Caesarean Section	190	54.3
Gender		
Girl	200	57.1
Boy	150	42.9
	Median	**Min-Max**
Gestational Age (week)	39	26-43
Age (month)	18	12-23
Birth Weight (g)	3200	870-4500
Birth Lenght (cm)	50	33-60

***** Since the number of children and the number of individuals in the family do not show normal distribution, they are given with the median and minimum-maximum values

EBF Duration and time to start CF

It was found that the median EBF duration of babies was 6 (0-9) months, the median time for mothers to start giving water to their babies was 12 (1-28) weeks, and the median time for mothers to start CF for their babies was 6 (4-10) months. In this research, babies' chronological ages were taken as the basis for time to start complementary feeding. Also, it was determined that 50.3% of the mothers exclusively breastfed their babies for the first six months, 28.6% started giving water to their babies at the 24th week, and 66.0% started CF at the 6th month.

CF practices in 6-8 months and 9-12 months periods

While the number of the mothers who started CF for their babies in the 6-8 months period was 346, all of the mothers participating in the research started CF for their babies in the 9-12 months period. CF practices of mothers in 6-8 months and 9-12 months periods are shown in Table 2. In the 6-8 months period, 69.4% of mothers fed their babies with 1-2 meals per day, 46.3% of them fed their babies with a tea glass of complementary foods, and 97.7% of them fed their babies with puree consistency of foods. In the 9-12 months period, 82.9% of mothers fed their babies with 3-4 meals per day, 67.1% of them fed their babies with a water glass of complementary foods, and 70.9% of them fed their babies with finger foods.

Table 2. Complementary feeding practices of mothers in 6-8 months and 9-12 months periods

	6-8 Months		9-12 Months	
	Number (n=346)	Percentage (%)	Number (n=350)	Percentage (%)
Number of Meals				
1-2 meals per day	243	69.4	22	6.3
3-4 meals per day	100	28.6	290	82.9
5-6 meals per day	3	0.9	38	10.9
Amount Per Meal				
A tea glass	162	46.3	96	27.4
A water glass	31	8.9	235	67.1
A soup bowl	0	0	15	4.3
A Turkish coffee cup	153	43.7	4	1.1
Consistency of Foods*				
Fluid	306	87.4	0	0
Puree	342	97.7	58	16.6
Mashed with a fork	20	5.7	185	52.9
Finger foods	3	0.9	248	70.9
Family Foods	0	0	164	46.9

* n is folded because more than one answer is given to this question

No significant difference was found when the number of meals per day in CF in the 6-8 months period was evaluated relative to the descriptive characteristics of mothers and their babies. However, it was determined that the age, the number of children and family members of the mothers who fed their babies 1-2 meals per day in CF in the 9-12 months period were significantly higher than those in the other group (p=0.005, p=0.004, and p=0.006, respectively).

A statistically significant difference was found when the amount consumed by the babies per meal in CF relative to the descriptive characteristics of the mothers was examined. The amount consumed by the babies of employed mothers was higher than the babies of unemployed mothers in both 6-8 months and 9-12 months periods (p=0.001 and p=0.002, respectively).

The factors affecting the EBF duration and time to start CF

The relations between some descriptive characteristics of mothers and their babies and the EBF duration and time to start CF were examined with the Pearson Correlation test and shown in Table 3. It was detected that there were weak positive correlations between the EBF duration and the number of family members (p=0.030 and r=0.116), gestational age (p<0.001 and r=0.206), birth weight (p=0.016 and r=0.129). Additionally, weak positive correlations were found between the time to start CF and the number of children (p=0.005 and r=0.151), the number of family members (p=0.005 and r=0.151) (Table 3).

Information about the EBF duration, time for mothers to start giving water to their babies, and time to start CF relative to other descriptive characteristics of mothers and babies are shown in Table 4 with median and minimum-maximum values.

Statistically significant differences were found in the EBF duration and the time to start CF relative to mothers' education levels (p=0.031 and p=0.003, respectively). It was observed that the EBF duration was the shortest

Table 3. The relations between some of the descriptive characteristics and the duration of exclusive breastfeeding, time to start complementary feeding (n=350)

Characteristics of Mothers		**Duration of Exclusive Breastfeeding**	**Time to Start Complementary Feeding**
Age	r	-0.090	0.037
	p	0.094	0.489
Number of Children	r	0.102	0.151**
	p	0.058	**0.005****
Number of Family	r	0.116*	0.151**
Members	*p*	**0.030***	**0.005****
Characteristics of Babies		**Duration of Exclusive Breastfeeding**	**Time to Start Complementary Feeding**
Gestational Age	r	0.206***	0.097
	p	**0.000*****	0.071
Birth Weight	r	0,055	0.032
	p	0.301	0.545
Birth Lenght	r	0.129*	0.011
	p	**0.016***	0.835

*p<0.05, **p<0.01, ***p<0.001

in the group of mothers who graduated from high school. In addition, it was determined that as the education level of the mothers increased, they started to give water to their babies later. And the mothers who started CF earliest were in the high school graduate or illiterate group. When the Post Hoc Test (Bonferroni) was performed among the education groups of the mothers, it was found that the EBF duration of babies of high school graduate mothers was significantly shorter than university graduate mothers (p=0.041). Additionally, it was found that the time to start CF of high school graduate mothers was significantly earlier than both primary school and secondary school graduate mothers (p<0.001 and p=0.010, respectively).

It was determined that unemployed mothers started giving water to their babies significantly earlier (p<0.001) while mothers with minimum wage and below income started both CF and giving water to their babies significantly earlier (p=0.008 and p=0.009, respectively). Statistically significant differences were found in the EBF duration of babies relative to the family type and birth type. According to the results, babies in extended families and babies born by vaginal birth had significantly longer EBF duration (p=0.014 and p=0.001, respectively) (Table 4).

It was detected that 67.7% of the mothers participating in the study gave yogurt, 6.0% of them gave fruit puree, and 16.9% of them gave soup to their babies as the first complementary food. Statistically significant relationships were found between the first complementary food given to the babies and the education and income levels of the mothers (p=0.010 and p<0.001, respectively). As the education level of the mothers increased, the rate of giving yogurt as the first complementary food increased (the rate was 78.0% for mothers with university degrees). In addition, the rate of giving yogurt as the first complementary food of mothers with an income above minimum wage (74.8%) was higher than those with the minimum wage and below income (56.6%). It was determined that the first complementary food given by mothers to their babies differed relative to the number of children and family members (p=0.001 and p=0.002, respectively). When the Post Hoc Test (Bonferroni) was performed, it was found that the number of children and family members of mothers who gave soup to their babies as the first complementary food was significantly higher than those who gave yogurt (p<0.001 and p<0.001, respectively) and those who gave fruit/vegetable puree (p=0.001 and p<0.001, respectively).

During the transition to CF, 31.7% of the mothers gave new food to their babies every day, 15.7% of them with a one-day break, 50.3% of them with a few days break. It was determined that the interval of mothers giving new complementary foods to their babies in CF depends on their education level and employment status (p<0.001 for both of them) and differs relative to the number

Table 4. Differences in the duration of exclusive breastfeeding, time to start giving water, and time to start complementary feeding with respect to other descriptive characteristics (n=350)

	Duration of Exclusive Breastfeeding (Month)			Time to Start Giving Water (Week)			Time to Start Complementary Feeding (Month)		
	Median	**Min-Max**	***p***	**Median**	**Min-Max**	***p***	**Median**	**Min-Max**	***p***
Mothers'									
Education Level									
Illiterate	5	0-6		6	1-24		6	4-6	
Primary School	6	0-9		8	1-24		6	4-10	
Middle School	6	0-8	**0.031***	10	1-28	**0.000*****	6	4-9	**0.003****
High School	4	0-6		12	1-24		6	4-6	
University	6	0-7		16	1-24		6	4-7	
Postgraduate	6	0-6		24	4-24		6	5-6	
Employment Status									
Employed	6	0-6	0.663	20	1-24	**0.000*****	6	4-7	0.567
Unemployed	6	0-9		11	1-28		6	4-10	
Household Income									
Minimum wage and ↓	5	0-8	0.528	11	1-28	**0.009****	6	4-8	**0.008****
Above minimum wage	6	0-9		16	1-24		6	4-10	
Family Structure									
Nuclear family	6	0-9	**0.014***	12	1-28	0.960	6	4-10	0.050
Extended family	6	6-7		10	1-24		6	6-7	
Babies'									
Birth Type									
Vaginal	6	0-8	**0.001****	12	1-24	0.597	6	4-9	0.174
Cesarean section	5	0-9		16	1-28		6	4-10	
Gender									
Girl	6	0-9	0.133	12	1-28	0.708	6	4-10	0.209
Boy	6	0-8		12	1-24		6	4-9	

*p<0.05, **p<0.01, ***p<0.001

of children and family members (p=0.005, p=0.014, respectively). While most of the university graduate mothers (68.8%) gave new complementary foods to their babies with a few-day break, most of the mothers who graduated from secondary school (65.0%) and high school (60.2%) gave new complementary foods to their babies more frequently. It was found that most of the employed mothers (72.0%) gave new complementary foods to their babies with a few-day break, whereas most of the unemployed mothers (55.2%) gave new complementary foods to their babies more frequently. In addition, the number of children and family members of mothers who gave new complementary foods to their babies with a one-day break or more frequently was higher than mothers who gave new complementary foods to their babies with a few-day break.

Discussion

EBF duration and time to start CF

In the study conducted by Baysal [16] in Denizli, it was found that the EBF duration (including water) was 6.0±1.2 months, and the time to start CF was 6.0±1 months. Similar to these findings, it was observed that the EBF duration was 6 (0-9) months, and the time to start CF was 6 (4-10) months in this research. While the rate of mothers who exclusively breastfed their babies for the first six months was 63.2% in Baysal's study [16], the rate in this research was 50.3%. In a study conducted in a hospital in Istanbul, the EBF duration was 4.3±2.0 months, and the rate of EBF for the first six months was 37.5% [17].

In the study of Aggarwal et al. [18], it was observed that 17.5% of mothers started CF at the 6th month as recommended, while 5.5% of them started CF before the 6th month [18]. In a multicenter study conducted in FHCs located in five different provinces of Turkey, it was found that CF was started for 25.6% of babies before the 6th month and 51.2% of them after the 6th month [10]. In this research, it was determined that 66.0% of the mothers started CF at the 6th month, and 30.6% earlier. Also, it was noted that none of the mothers started CF before the 4th month. The reason for the similarities and differences among the results obtained from these studies about the EBF duration and time to start CF may be due to the similarities and differences in the sociodemographic characteristics of the mothers participating in these studies.

In the study of Kaynar Tuncel et al. [19], it was found that the mean time for mothers to start giving water to their babies without giving any complementary food was 23.7±28.7 days. Unlike this finding, in this research, the time for mothers to start giving water to their babies was found to be 12 (1-28) weeks. The fact that the majority of the mothers participating in this research (38.0%) were university graduates and the majority of the mothers participating in the study of Kaynar Tuncel et al. [19] (50.4%) were primary school graduates suggests that this difference between these two studies may be related to the education levels of the mothers.

CF practices of mothers in 6-8 months and 9-12 months periods

In the study of Fein et al. [20], it was found that most of the babies were fed at least five times per day in CF in the 6-12 months period, and the rate of the babies fed less than five meals was less than 20%. In the study conducted by Aggarwal et al. [18] with 6-24 months old babies, it was determined that 8.3% of babies were fed one meal, 52.4% of them were fed two meals, 31.5% of them were fed three meals, and 7.8% of them were fed more than three meals per day. In this study, it was observed that 69.4% of mothers fed their babies 1-2 meals per day in the 6-8 months period, and 82.9% of them fed their babies 3-4 meals per day in the 9-12 months period. This situation shows that there may be differences in CF practices between countries despite global recommendations, as can be seen between different provinces of a country.

Turkey Dietary Guidelines (TUBER) [21], published in 2019 by the Republic of Turkey Ministry of Health, recommends in the complementary feeding babies be fed with 2-3 meals per day in the 6-8 months period and 3-4 meals per day in the 9-11 months period. WHO [22] recommends babies be fed with 2-3 meals (and 1-2 snacks depending on the child's appetite) per day in the 6-8 months period and 3-4 meals (and 1-2 snacks depending on the child's appetite) per day in the 9-11 months period. According to these recommendations, in this study, it is seen that mothers do not feed their babies frequently enough in the 6-8 months period, but they feed their babies frequently enough in the 9-11 months period.

TUBER recommends in complementary feeding babies be fed with 150-200 g complementary foods per meal in the 6-8 months period and 210-280 g complementary foods per meal in the 9-11 months period [21]. WHO recommends babies be fed with ½ of a 250 ml cup complementary foods per meal in the 6-8 months period and ½ of a 250 ml cup or bowl complementary foods per meal in the 9-11 months period [22]. In this study, 46.3% of mothers fed their babies with a tea glass amount complementary foods per meal in the 6-8 months period, and 67.1% of them nourished their babies with a water glass amount complementary foods per meal in the 9-12 months period. When these findings are compared with these recommendations, approximately half of mothers in this study feed their babies with adequate complementary foods in the 6-8 months period. However, it is remarkable that 43.7% of mothers fed their babies with a Turkish coffee cup amount complementary foods per meal in the 6-8 months period. According to the TUBER's suggestions, most mothers in this study fed their babies with sufficient amounts of complementary foods in the 9-11 months period, but according to the WHO's recommendations, they nourished their babies with more quantities of complementary foods in the 9-11 months period.

TUBER recommends in complementary feeding babies be fed with soup, thick and well-mashed puree in the 6-8 months period, and with semi-solid, rough, thinly chopped, finger-sized foods in the 9-11 months period [21]. WHO recommends babies be fed with thick porridge, well-mashed foods initially, and then with well-mashed family foods in the 6-8 months period; and with finely chopped or mashed foods and foods that babies can pick up in the 9-11 months period [22]. In this study, 97.7% of mothers fed their babies with purees in the 6-8 months period, and 70.9% of mothers fed their babies with finger foods in the 9-12 months period. It is seen that most mothers fed their babies with the foods in appropriate consistency both in the 6-8 months and 9-12 months periods. However, it is remarkable that most mothers (87.4%) also preferred fluids to feed their babies in the 6-8 months period.

Factors affecting EBF duration

In a study conducted in Trabzon, no significant difference was found in the EBF practices of mothers for the first six months relative to income levels and birth type. But it was determined that mothers who were 25 years old and older, primary school graduates, unemployed, had an extended family structure, and had three or more children had a significantly higher tendency to exclusively breastfed their babies for the first six months [9]. While there was no significant difference in the EBF duration relative to mothers' age, number of children, employment status, and income level in this research, statistically significant differences were found in the EBF duration relative to mothers' education level, family structure, number of family members and birth type. When the education level of the mothers was examined, it was observed that the tendency to exclusively breastfeed their babies for the first six months was higher in mothers who graduated from secondary school or university and the lowest in mothers who graduated from high school. Additionally, it was found that mothers with extended family structure tended to breastfeed their babies exclusively for the first six months and as the number of family members increased, the EBF duration lengthened. This finding can be explained by possible reasons such as the fact that elders encourage breastfeeding and help mothers in extended families. In this study, it was also determined that babies who were born by vaginal birth had a longer EBF duration. Its reason may be that babies born by vaginal birth are breastfed earlier, and the first food they took is breast milk. In the study of Ozkul Saglam et al. [8], it was determined that the birth type was effective on the EBF duration and the EBF duration was significantly shorter in babies born by cesarean section. In a study conducted in İzmir, no significant relationship was found between gestational age and the EBF duration. On the other hand, the percentage of exclusive breastfeeding for the first six months was found to be significantly higher in babies with 2500 g and above [23]. In this research, weak positive correlations were noted between the EBF duration and both gestational age and birth weight. As the gestation period shortens, the birth weight of babies generally decreases, which may cause mothers to think that their milk is not enough for their babies, and to give other foods to their babies in addition to breast milk. And this may affect the EBF duration of babies.

Factors affecting CF practices

Whereas there was no significant difference in time to start CF relative to birth type in this research, it was found that the rate of prematurely starting CF was significantly higher in the babies born by cesarean section in the study of Unalan et al. [24]. Likewise, in the study conducted by Ozkul Saglam et al. [8], it was determined that the time to start CF was significantly earlier in the cesarean section. In this research, it was observed that the birth type only affects the EBF duration but not the time to start CF. And this can be interpreted as that mothers in this research waited for the sixth month to start CF even if they started giving formula to their babies for any reason. In the study conducted by Kaya et al. [25], it was determined that there was a statistically significant relationship between the age of the mothers and the time they started giving complementary foods to their babies. In this research, there was no significant relation between the age of the mothers and time to start CF. But weak positive relations were found between the time to start CF and the number of children and family members. There was a significant relationship between the number of family members and the EBF duration, and the relationship between the number of children and the EBF duration was at the limit of significance. These findings can be interpreted as these factors affecting the EBF duration also affect the time to start CF. In the study of Kaya et al. [25], a statistically significant relationship was found between the education level of the mothers and the time to start CF, similar to this study. In a study conducted in FHCs located in Isparta, a significant difference was found between the income level of mothers and time to start CF. And it was determined that most mothers with moderate and good incomes (55.1% and 88.9%, respectively) started CF at 4-6 months [26]. Likewise, in this study, a statistically significant difference was observed between the income level of the mothers and the time to start CF. However, in this research, the mothers with minimum wage and below income started CF earlier. 67.7% of the mothers participating in this research gave yogurt as the first complementary food to their babies. Soup (16.9%), fruit puree (6.0%), fruit juice (3.1%)-egg yolk (3.1%), and vegetable puree (2.0%) followed yogurt as a choice of first complementary food, respectively. In the study conducted by Ozkul Saglam et al. [8], it was found that yogurt came first among the foods that mothers preferred to give their babies as the first complementary food. And the rates of foods chosen as a first complementary food were 38% for yogurt, 28% for fruit puree, 19% for soup, 10% for custard, and 5% for baby biscuits. Also, in the study of Gumustakim et al. [10], it was determined that 41.3% of mothers gave yogurt, 14.9% of them gave soup, and 12.8 of them gave fruit puree as the first complementary food to their babies. The reason yogurt is the most preferred first complementary food in all of these studies may be that, in line with the recommendations of the Ministry of Health, health institutions recommend mothers to give yogurt to their babies as the first complementary food.

In a study conducted in a training-research hospital in Istanbul, it was found that there was a statistically significant relationship between the education levels and the first complementary food choices of mothers [25]. Likewise, in this research, a statistically significant relationship was found between the mothers' education levels and the first complementary food given to the babies. And it was detected that the percentage of giving yogurt as the first complementary food increased as the education level increased. Also, in this research, it was observed that mothers with income above the minimum wage had higher rates of giving yogurt as the first complementary food to their babies. These differences among the groups of education and income levels can be explained by the fact that as the mothers' education level increases, the level of knowledge about baby nutrition also increases, and the financial opportunities of the mothers with higher incomes are wider. Also, in this research, it was determined that the number of children and family members was higher in the group of mothers who gave soup to their babies as the first complementary food. These findings can be explained by the decrease in the number of children and family members as the education level of mothers increases.

Limitations of the research

The limitations of this research are having no observation or monitoring program, collecting the data through retrospective data collection forms during interviews with mothers, filling out data collection forms based on the mothers'

statements. Another limitation of this research is that the birth weights and heights of the babies could not be measured.

In conclusion, the EBF duration is 6 (0-9) months, and it varies significantly relative to the mothers' education levels, family type, and babies' birth type. Furthermore, there are weak positive correlations between the EBF duration and the number of family members, gestational age, birth length of the baby. The time for mothers to start giving water to their babies is 12 (1-28) weeks, and the mothers' education levels, employment status, income levels are the factors that significantly affect this time. The time to start CF is 6 (4-10) months. Education and income levels of mothers significantly affect the time to start CF. Additionally, there are weak positive correlations between the time to start CF and the number of children and family members. In this research, 66.0% of mothers have remarked that they started CF for their babies at the 6th month, 50.3% of them have remarked that they exclusively breastfed their babies for the first six months. Yet, it was determined that only 28.6% of them started giving water to their babies at the 24th week. In the 6-8 months period, most mothers have fed their babies 1-2 meals per day, with the amount of "1 tea glass" per meal and foods in puree consistency. In the 9-12 months period, most mothers have fed their babies 3-4 meals per day, with the amount of "1 water glass" per meal and finger foods. Most mothers have given yogurt to their babies as the first complementary food and switched to new complementary foods with a few-day break. Education and income levels and the number of children and family members of the mothers are the factors that significantly affect the first complementary food that they have given to their babies. The factors affecting the transition time of mothers to new complementary foods are mothers' education levels, employment status, number of children, and family members.

In the light of these findings, mothers should be informed that the definition of EBF is that babies do not receive any liquids or solids, not even water, other than breast milk. Also, they should be enlightened that breast milk is sufficient to meet all the needs of babies for the first six months, and CF should be started at the 6th month while continuing breastfeeding. Training courses on baby nutrition should be organized for mothers. In these courses, the correct CF practices, which can meet the energy and nutrient needs of babies to improve their healthy growth and development, should be taught to mothers. Dietitians should take an active role in all these processes to actualize these recommendations. They also should part in FHCs to inform andassist mothers in providing the most appropriate nutrition for babies.

On the other hand, we need to do further research to explore the factors that affect the practices of mothers in baby nutrition, especially in CF. In the light of the results of these studies, we can determine the fundamental factors and develop solutions to correct the incorrect practices of mothers in baby nutrition. In addition, future research may examine the effectiveness of training courses for mothers to improve correct practices in baby nutrition.

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Contributions of the authors to the article

E.S., A.D.K. and S.Ş. designed the research study. E.S. collected the data. E.S. and S.Ş. analyzed the data. E.S. wrote the manuscript. A.D.K. and S.Ş. assisted in writing and editing the manuscript. E.S., A.D.K. and S.Ş. read and approved the final manuscript.