

Maternal attitudes toward infant feeding and breastfeeding duration among mothers of healthy term infants: An Iowa infant feeding attitude scale study

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ABSTRACT

Objective: This study aimed to assess maternal attitudes toward infant feeding using the Iowa Infant Feeding Attitude Scale (IIFAS) and to examine the associations of these attitudes with maternal sociodemographic characteristics and breastfeeding practices.

Materials and Methods: The study included 305 mothers whose healthy term born children had no chronic diseases, and were 6 to 24 months of age. A questionnaire addressing demographic characteristics was administered during face-to-face interviews. The IIFAS was also used to assess maternal attitudes toward infant feeding. Spearman's correlation and nonparametric group comparisons (Mann–Whitney U and Kruskal–Wallis tests) were used to examine associations between IIFAS scores and maternal sociodemographic characteristics and breastfeeding practices.

Results: The mean age of the participants' children was 14.7±4.7 months, and 54.8% were male. The mean IIFAS score was 71.7±5.6 (range: 48–82), indicating that most mothers had attitudes favoring breastfeeding. Mothers with university-level education or higher had significantly higher IIFAS scores than those with lower levels of education ($p<0.001$). Employed mothers had significantly lower scores than non-employed mothers ($p=0.016$). Significant but weak-to-moderate positive correlations were found between IIFAS scores and maternal education level ($r=0.28$, $p<0.001$) and the duration of exclusive breastfeeding ($r=0.12$, $p=0.029$), whereas the interval between birth and breastfeeding initiation was weakly negatively correlated with IIFAS scores ($r=-0.18$, $p=0.012$).

Conclusion: Maternal attitudes toward breastfeeding, as measured by the IIFAS, were primarily associated with educational background and employment status, and may also be related to the duration of exclusive breastfeeding. These findings are hypothesis-generating; whether targeted educational initiatives and workplace policies that support lactation improve breastfeeding practices remains to be tested in prospective studies.

Keywords: Attitude, breast milk expression, breastfeeding, infant

Introduction

Breastfeeding contributes significantly to infant growth and development, and supports lifelong health (1). The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) recommend initiating breastfeeding within the first hour after birth, exclusively breastfeeding infants for the first six months without providing any other liquids or solid foods, including water, and continuing breastfeeding alongside complementary feeding until two years of age (1–3). Breast milk reduces perinatal mortality and helps prevent many childhood and adult diseases (4). The Global Breastfeeding Collective guidelines aim to promote breastfeeding practices worldwide and increase the proportion of infants exclusively breastfed for the first 6 months to 50% by 2025 (5).

Maternal commitment, education, and attitudes toward breastfeeding strongly influence the breastfeeding process.

Several validated scales have been developed to measure mothers' knowledge and attitudes toward breastfeeding. One such instrument is the Iowa Infant Feeding Attitude Scale (IIFAS), which is widely used internationally (5). The scale has been used both to assess attitudes toward breastfeeding and to predict breastfeeding outcomes. The IIFAS has undergone validity and reliability testing in Turkish and is a reliable instrument for identifying mothers at risk of early weaning and for assessing the attitudes of spouses and close family members (6).

The IIFAS has been validated in Turkish populations and used to assess and promote breastfeeding attitudes among mothers of newborns and infants younger than 6 months (7–10). One study also recruited mothers through social media platforms (11). Another study administered both the IIFAS and the Parental Feeding Style Questionnaire (PFSQ) to mothers of infants aged 0–24 months recruited through social media and

outpatient clinics (12). Previous Turkish IIFAS studies have largely focused on the antenatal period or the first six months postpartum; comparatively little attention has been given to feeding attitudes among mothers of term infants aged 6–24 months or to the reasons underlying early weaning in this group. We hypothesized that higher IIFAS scores would be positively associated with higher maternal education levels, not being employed, and longer breastfeeding durations. We also examined the reasons for early cessation of breastfeeding. In this study, total IIFAS scores were calculated and compared with mothers' demographic characteristics to investigate potential associations.

Materials and Methods

This cross-sectional study included 305 mothers whose infants were aged 6–24 months and who attended the Child Health and Diseases Outpatient Clinics at Prof. Dr. Cemil Taşcıoğlu City Hospital. This study was conducted between August 22, 2023, and October 6, 2023. Mothers were included if their children attended the clinics, they agreed to participate, and they signed the informed consent form. The sample size was calculated using G*Power based on the correlation between the total IIFAS score and the associated variables. For a two-tailed correlation analysis, assuming a small effect size ($d = 0.15$), a Type I error rate (α) of 0.05, and 80% statistical power, the minimum required sample size was 270. To account for potentially missing or invalid data, the planned sample size was increased by approximately 10% to 300 participants. A structured demographic questionnaire was administered during face-to-face interviews. In addition, participants' knowledge and attitudes toward breastfeeding were assessed using the IIFAS.

The IIFAS was originally developed by De la Mora et al. (5) in the United States and has since been validated in numerous languages and cultural settings. It was adapted into Turkish by Ekşioğlu et al. (6), who established its content and predictive validity, test–retest stability, and internal consistency, thereby confirming that it was a valid and reliable instrument for assessing infant feeding attitudes among Turkish mothers. The validated Turkish version was used in the present study. The IIFAS is designed to assess women's attitudes toward infant feeding and predict their selected feeding method and breastfeeding duration. It comprises 17 items rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Items 1, 2, 4, 6, 8, 10, 11, 14, and 17 were reverse-scored (i.e., 1=5, 2=4, 4=2, 5=1), and the item scores were then summed. Nine items are worded favorably toward breastfeeding, whereas the remaining eight items are worded favorably toward formula feeding. The total IIFAS score ranges from 17 to 85, with higher scores indicating a more positive attitude toward breastfeeding. Total scores may be classified as follows: (1) positive attitude toward breastfeeding (IIFAS score 70–85), (2) a neutral attitude (IIFAS score 49–69), and (3) a positive attitude toward formula feeding (IIFAS score 17–48).

Statistical analysis

After data coding, the data were analyzed using the Statistical Package for the Social Sciences (SPSS) software (Version 22

for Windows; SPSS Inc., Chicago, IL, USA). The distribution of each continuous variable was tested for normality using the Kolmogorov–Smirnov test. Continuous variables were presented as the mean and standard deviation and median (first quartile–third quartile), while categorical variables were presented as frequencies and percentages. Categorical variables were compared using Pearson's chi-square test or Fisher's exact test.

Because the continuous variables were not normally distributed, nonparametric tests were used for between-group comparisons and correlation analyses. The Mann–Whitney U test was used to compare two groups, and the Kruskal–Wallis test was used to compare multiple groups. When a significant difference was detected, pairwise post hoc comparisons were performed using the Mann–Whitney U test with Bonferroni correction. Effect sizes were calculated as $r = |Z|/\sqrt{N}$ for the Mann–Whitney U test and $\epsilon^2 = (H - df)/(N - df - 1)$ for the Kruskal–Wallis test.

The association between the IIFAS score and selected variables was assessed using Spearman's rank correlation analysis. The strength of the correlation coefficients was interpreted according to Cohen's classification: an absolute value of 0.10–0.29 was considered weak, 0.30–0.49 as moderate, and ≥ 0.50 as strong. The sign of the coefficient indicated the direction of the association, whereas its absolute value indicated the strength of the association.

Multivariable linear regression analysis was performed to identify the independent predictors of the IIFAS score. Candidate predictors were selected a priori based on previous literature and clinical relevance, and variables associated with the IIFAS score at $p < 0.20$ in univariate analyses were entered into the multivariable model. Variables were entered into the model simultaneously using the Enter method. The assumptions of linearity, residual normality, homoscedasticity, and independence were assessed using standardized residual histograms, normal P–P plots, ZPRED–ZRESID scatterplots, and the Durbin–Watson statistic. Although the raw distribution of the IIFAS score showed a deviation from normality, the distribution of the model residuals met the normality assumption required for linear regression; therefore, the linear regression analysis was continued. Multicollinearity was examined using tolerance and variance inflation factor (VIF) values; tolerance values > 0.10 and VIF values < 5 were considered acceptable. Results are presented as unstandardized regression coefficients (B), standard errors, standardized regression coefficients (β), 95% confidence intervals, and p-values. Statistical significance was set at $p < 0.050$.

All statistical comparisons were based on the continuous IIFAS score. Written permission to use the IIFAS was obtained from the original scale developers before data collection.

Results

The sociodemographic characteristics of the mothers (age, education level, employment status, marital status, and household income level) and of their children (sex, birth weight, mode of delivery, and birth order) are presented in Table I.

Table I: Distribution of maternal and child demographic characteristics

Variable	n (%)
Maternal age (years)	
18–24	38 (12.4)
25–40	253 (82.9)
>40	14 (4.5)
Maternal education level	
Illiterate	8 (3.1)
Primary/secondary school	168 (65.3)
University	68 (26.4)
Master's/Doctorate	13 (5.0)
Maternal employment status	
Employed	99 (32.5)
Unemployed	206 (67.5)
Family income level	
Minimum wage or below	32 (10.5)
Above minimum wage	273 (89.5)
Maternal smoking/alcohol use	
Yes	48 (15.7)
No	257 (84.3)
Child's birth weight (g)	
2500–3999	293 (96.1)
4000–4500	12 (3.9)
Mode of delivery	
Vaginal	174 (57.0)
Cesarean section	131 (43.0)
Birth order of the child	
First	83 (27.2)
Second	150 (49.2)
Third	54 (17.7)
Fourth or higher	18 (5.9)

Regarding the timing of breastfeeding initiation, 49.8% of mothers reported initiating breastfeeding within the first hour after delivery. More than half of the mothers (56.7%) exclusively breastfed their infants for four to six months, and 72.1% were still breastfeeding (with or without complementary feeding) at the time of the study. The distribution of breastfeeding and complementary feeding practices is presented in Table II.

Maternal attitudes toward infant feeding were assessed using the IIFAS. The mean IIFAS score among the 305 participating mothers was 71.7 ± 5.6 , with a median of 73 (Q1: 69; Q3: 76).

We also examined whether IIFAS scores differed according to selected maternal sociodemographic characteristics, including age, educational attainment, employment status, marital status, household income, number of children, and tobacco or alcohol use. Comparisons of IIFAS scores across these sociodemographic categories are presented in Table III.

A statistically significant difference in IIFAS scores was observed across maternal education levels (Table III). The overall difference was statistically significant ($p < 0.001$). In the post hoc pairwise comparisons, participants with a university education had significantly higher median scores than literate participants (median: 74, IQR: 70–77 vs. median: 68, IQR: 64–73, $p = 0.004$). Mothers with a university education also had significantly higher scores than those with elementary/middle school education ($p = 0.03$), and mothers with a master's or doctoral degree had significantly higher scores than both literate mothers ($p = 0.013$) and those with elementary/middle school education ($p = 0.011$).

Table II: Mothers' responses regarding breastfeeding, formula, and complementary feeding practices

Variables	n (%)
Timing of first breastfeeding	
Within the first hour	152 (49.8)
Between 1–2 hours	123 (40.3)
Between 3–24 hours	24 (7.9)
After 24 hours	6 (2.0)
Duration of exclusive breastfeeding	
No period of exclusive breastfeeding	75 (24.6)
0–2 months	40 (13.1)
2–4 months	17 (5.6)
4–6 months	173 (56.7)
>6 months	0 (0.0)
Who encouraged you to breastfeed?	
Healthcare professionals	126 (41.3)
Family elders	110 (36.1)
Husband	5 (1.6)
Friends	0 (0.0)
Media	64 (21.0)
Did your child take formula?	
Yes	141 (46.2)
No	164 (53.8)
When did you start formula feeding?	
1 st month	75 (53.2)
2 nd month	39 (27.7)
3 rd month	12 (8.5)
4 th month	5 (3.5)
5 months or older	10 (7.1)
When did you introduce complementary foods?	
4–6 months	116 (38.0)
6–12 months	184 (60.3)
12–24 months	5 (1.7)
What is your reason for starting formula feeding?	
Insufficient breast milk	73 (53.5)
Maternal health or medication use	13 (8.2)
Latch difficulties	12 (8.9)
Inadequate weight gain in children	34 (22.9)
Pressure from father or family elders	7 (4.4)
Breast milk allergy	5 (3.1)
Other reasons (beneficial, aesthetic concerns, etc.)	35 (21.0)
Did not start complementary foods	8 (2.6)
Duration of complementary breastfeeding	
1–4 months	32 (10.5)
4–6 months	29 (9.5)
6–12 months	101 (33.1)
>12 months	135 (44.3)
Who gave you the formula recommendation?	
I researched it myself	112 (79.4)
From the pediatrician	25 (17.7)
Relatives, friends, nurses, or family elders	4 (2.8)
Reason for starting complementary feeding	
Slow weight gain	4 (1.3)
Pediatrician's recommendation	48 (15.8)
Own decision	236 (77.9)
Pressure from father or family elders	12 (4.0)
Other (cessation of milk, baby self-weaning)	3 (1.0)
Reason for stopping breastfeeding	
Still breastfeeding	220 (72.1)
Maternal health problems	24 (7.8)
Nipple/breast incompatibility	9 (3.0)
Work-related reasons	8 (2.6)
Milk supply ceased	12 (3.9)
Baby self-weaned	21 (6.9)
Baby not satisfied/full	7 (2.3)
Baby's health problems	4 (1.3)

Table III: Comparison of IIFAS scores according to participants' sociodemographic characteristics

Variables	IIFAS Scores*	p	Effect size (ϵ^2)
Age (year)			
18-24	72 (68-75)	0.340 [†]	0.001
25-40	73 (69-76)		
Older than 40	70.5 (69-75)		
Education			
Literate (a)	68 (64-73)	<0.001 [†]	0.075
Elementary/middle school (b)	72 (68-75)		
High School (c)	72.5 (68-76)		
University (d)	74 (70-77)		
Doctorate-Master's degree (e)	77.5 (70-77)		
Work Status			
Working	71 (68-75)	0.016 [‡]	0.137
Not working	73 (70-77)		
Marital status			
Married	73 (69-76)	0.490 [†]	0.000
Divorced	72 (66-75)		
Husband has died	72 (65-73)		
Family income level			
Minimum wage and below	74 (68-76)	0.340 [‡]	0.001
Above minimum wage	72.5 (69-76)		
Number of children			
1	73 (68-76)	0.470 [†]	0.000
2	73 (69-75)		
3	72 (68-74)		
4	72 (66-77)		
5 or more	74 (68-78)		
Smoking / Alcohol consumption			
Yes	73 (68-74)	0.060 [‡]	0.000
No	74 (69-76)		
Age of the child			
6-12 months	72 (67-76)	0.730 [†]	0.000
13-18 months	73 (69-75)		
19-24 months	73 (70-76)		
Gender			
Male	73 (69-75)	0.670 [‡]	0.000
Female	72.5 (55-82)		
Child's birth weight (g)			
2500-4000	70 (69-76)	0.340 [‡]	0.000
Above 4000	70 (59-82)		
Mode of delivery			
Vaginal	73 (70-76)	0.070 [‡]	0.007
Cesarean	72 (48-82)		
Birth order of the child			
First	72.5 (68-76)	0.840 [†]	0.000
Second	73 (69-72)		
Third	72 (69-75)		
Fourth	74 (67-78)		
Fifth or higher	73 (66-78)		

*: median (Q1-Q3), †: Kruskal-Wallis test (Post hoc Mann-Whitney U Test with Bonferroni correction), ‡: Mann-Whitney U Test, **IIFAS**: Iowa Infant Feeding Attitude Scale, **MD**: Median Difference, **CI**: Confidence Interval

Employment status was also significantly associated with breastfeeding attitudes. Employed mothers had lower IIFAS scores (median: 71, IQR: 68- 75) than mothers who were not employed (median: 73, IQR: 70- 77, $p=0.016$) (Table III).

Median IIFAS scores were compared by child age, sex, birth weight, mode of delivery, and birth order. No statistically significant differences were found for any of these characteristics, including mode of delivery (Table III).

Table IV: Comparison of IIFAS scores based on participants' feeding practices

Variables	IIFAS Scores*	p	Effect size
Timing of first breastfeeding			
Within the first hour	73 (70-76)	0.070 [†]	0.015
Between 1-2 hours	71 (68-76)		
Between 3-24 hours	71 (64-75)		
After 24 hours	73 (67-75)		
Duration of exclusive breastfeeding			
0-2 months (a)	71 (68-76)	0.035 [†]	0.019
2-4 months	72 (65-74)		
4-6 months	72 (69-75)		
More than 6 months (b)	73 (70-76)		
Start complementary foods			
4-6 months	71 (48-81)	<0.001 [†]	0.090
After 6 th month	74 (60-82)		
Duration of complementary breastfeeding			
1-4 months (a)	71 (59-75)	0.003 [†]	0.066
4-6 months (b)	71.5 (66-74)		
6-12 months	72.5 (68-76)		
12-24 months (c)	74 (69-78)		
Breastfeeding status			
Stopped	72 (66-75)	0.080 [‡]	0.015
Actively breastfeeding	73 (69-76)		
Reasons for introducing complementary foods			
Slowing weight gain (a)	75 (68-76)	0.040 [†]	0.024
Pediatrician's recommendation	73 (66-74)		
I decided myself	72 (67-74)		
Pressure from father or family elders (b)	67 (65-73)		
Other*	71 (68-74)		
Reasons for breastfeeding cessation			
Maternal or infant health complications	72 (65-74)	0.130 [‡]	0.086
Breast incompatibility	71.5 (66-75)		
Milk drying up	73 (66-77)		
Infant formula use			
Yes	71 (68-75)	0.004 [‡]	0.164
Timing of formula introduction			
1 st month (a)	71 (66-74)	<0.001 [†]	0.148
2 nd month (b)	69 (65-74)		
3 rd month (c)	73.5 (70-78)		
4 th month (d)	78 (70-78)		
5 th month and above (e)	76 (72-81)		

*: median (Q1-Q3), †: Kruskal-Wallis test (Post hoc Mann-Whitney U Test with Bonferroni correction), ‡: Mann-Whitney U Test, **IIFAS**: Iowa Infant Feeding Attitude Scale, **MD**: Median Difference, **CI**: Confidence Interval

The associations between IIFAS scores and various breastfeeding practices were examined, including the timing of breastfeeding initiation after birth, the duration of exclusive breastfeeding, the timing of the introduction of complementary foods, the total breastfeeding duration, and the reasons for initiating or discontinuing breastfeeding. These comparisons are presented in Table IV.

IIFAS scores were significantly and positively correlated with maternal education level ($r=0.28$, $p<0.001$), total breastfeeding duration ($r=0.20$, $p<0.001$), and the timing of formula feeding initiation ($r=0.28$, $p<0.001$). A weak positive

Table V: Relationship between IIFAS scores and selected variables

Variables	rho	95% CI	p*
Maternal age group (ref: 18-24 years)	0.02	-0.15 – 0.16	0.680
Maternal education level (ref: Literate)	0.28	0.12 – 0.48	<0.001
Number of children	-0.13	-0.24 – 0.11	0.820
Child's age	0.08	-0.17 – 0.18	0.510
Birth order of the child	-0.004	-0.25 – 0.12	0.940
Time to initiation of breastfeeding after birth (ref: within the first hour)	-0.18	-0.34 – -0.01	0.012
Duration of exclusive breastfeeding	0.12	0.002 – 0.24	0.029
Total breastfeeding duration together with complementary foods	0.20	0.12 – 0.43	<0.001
Time of starting formula feeding	0.28	0.15 – 0.46	<0.001
Mothers' opinion on how long a child should be breastfed (ref: 4 months)	0.04	-0.07 – 0.15	0.430

*: Spearman correlation test, **ref**: reference category, **CI**: Confidence Interval

correlation was found between IIFAS scores and the duration of exclusive breastfeeding ($r=0.12$, $p=0.029$), whereas a weak negative correlation was found between IIFAS scores and the timing of breastfeeding initiation after birth ($r=-0.18$, $p=0.012$). No significant correlations were found between IIFAS scores and maternal age ($r=0.02$, $p=0.680$), the child's birth order ($r=-0.004$, $p=0.940$), or the child's age ($r=0.08$, $p=0.510$). These results are presented in Table V.

The multiple linear regression model examining the associations of maternal age, maternal education level, maternal employment status, household income level, and number of children with IIFAS scores was statistically significant [$F(5.299)=9.751$; $p<0.001$]. The model explained 14.0% of the variance in the total IIFAS score ($R^2=0.140$; adjusted $R^2=0.126$). Higher maternal education level was significantly associated with higher IIFAS scores ($B=2.125$; $\beta=0.386$; $p<0.001$), whereas employed mothers had lower IIFAS scores than non-employed mothers ($B=-2.900$; $\beta=-0.239$; $p<0.001$). Maternal age ($p=0.803$), household income ($p=0.216$), and number of children ($p=0.693$) were not significantly associated with IIFAS scores (Table VI).

Discussion

Because this was a cross-sectional observational study, the present findings reflect associations and should not be interpreted as evidence of causal relationships. Given the relatively large sample size, several statistically significant correlations were weak. In such cases, statistical significance does not necessarily indicate a clinically meaningful association; therefore, these findings should be interpreted with caution. In our study, 49.8% of mothers reported initiating breastfeeding within the first hour after birth. This rate is higher than those reported in some countries; however, it remains below the WHO's global target of 70% (13). In some countries, the rate is around 30%, whereas in countries with advanced healthcare

systems, it exceeds 80% (14,15). In a study conducted in Jordan, only 43% of mothers initiated breastfeeding within 24 hours after birth, and 28.6% did not initiate breastfeeding before discharge (16). Because the cesarean delivery rate was also high in our sample, breastfeeding initiation during the first hours after birth may have been delayed. To promote early breastfeeding initiation, healthcare professionals should support and guide mothers in the first hours after birth alongside efforts to raise public awareness. The higher IIFAS scores among mothers who initiated breastfeeding within the first hour in our study are consistent with this observation. A study conducted in a neonatal intensive care unit similarly found that earlier breastfeeding initiation was associated with more positive maternal feeding attitudes and reported a mean IIFAS score of approximately 56 (7). A particular focus of our study was whether maternal feeding attitudes, as measured by the IIFAS, were associated with early breastfeeding cessation. We therefore examined the reasons mothers gave for discontinuing exclusive breastfeeding and introducing formula. The most commonly reported reasons for introducing formula were perceived insufficient breast milk production (53.5%) and perceived inadequate infant weight gain (22.9%). Unlike a previous Turkish study that collected data online through social media, our study provides face-to-face interview data on this relationship among mothers of healthy term infants (11). Parental concerns about inadequate nutritional intake or insufficient infant weight gain may lead to the use of alternative feeding methods, potentially contributing to early breastfeeding cessation.

Our data showed that 56.7% of mothers exclusively breastfed their infants for four to six months. This rate is higher than the global average of 44% reported for exclusive breastfeeding among infants aged 0–6 months during 2015–2020 (4). However, it remains below the level specified in the WHO's recommendation exclusive breastfeeding during the first six months of life (14). At the time of the study, 72.1% of mothers reported that they were still breastfeeding (with or without complementary foods). Compared with regional data, the exclusive breastfeeding rate in our sample (56.7% for four to six months) was higher than UNICEF estimates for infants aged 0–5 months in several countries in the region: 25% in Jordan, 40% in Egypt, 35% in Morocco, 39% in Palestine, 29% in Syria, 14% in Tunisia, 29% in Algeria, 26% in Iraq, and 53% in Iran (17). These figures indicate that exclusive breastfeeding was comparatively common in our sample.

In a Turkish study involving 391 mothers of newborns and using the Turkish version of the IIFAS, the mean IIFAS score was 48.11 ± 6.57 (9). In a study conducted in Canada, the mean IIFAS score was 64 ± 10.4 ; in another study of Chinese mothers, it was 57.7 ± 5.1 ; and in the United Kingdom, it was 70.6 (18–20). Another Canadian study found that mothers' intention to breastfeed was associated with higher IIFAS scores (19). The higher IIFAS scores in our study may be explained by the fact that all participating infants were healthy and born at term, which may have facilitated successful breastfeeding initiation. The sociodemographic characteristics of our sample, access to professional lactation support, and a culturally supportive environment for breastfeeding may also have contributed to more positive attitudes toward infant feeding.

Table VI: Multivariable linear regression analysis for the predictors of IIFAS scores

Variable	B	SE	β	t	p	95% CI	Tolerance	VIF
Constant	67.26	1.83	—	36.753	<0.001	63.658–70.861	—	—
Maternal age	0.19	0.761	0.014	0.249	0.803	–1.308–1.687	0.976	1.025
Maternal education level	2.125	0.322	0.386	6.599	<0.001	1.491–2.759	0.84	1.19
Maternal employment status	–2.900	0.706	–0.239	–4.111	<0.001	–4.289–1.512	0.851	1.176
Household income level	–1.268	1.021	–0.069	–1.241	0.216	–3.277–0.742	0.922	1.084
Number of children	0.127	0.32	0.021	0.395	0.693	–0.504–0.757	0.972	1.028

Model summary: $R=0.374$; $R^2=0.140$; adjusted $R^2=0.126$; standard error of the estimate=5.321, $F(5,299)=9.751$, $p<0.001$, $n=305$, **B:** unstandardized regression coefficient, **SE:** standard error, **β :** standardized regression coefficient, **CI:** confidence interval; **VIF:** variance inflation factor

In our study, income level was not correlated with IIFAS scores, whereas the Jordanian study found that mothers with high or middle incomes had higher IIFAS scores (16). In the same study, mothers who exclusively breastfed had higher scores than those who also provided other foods. Similarly, longer durations of exclusive breastfeeding were associated with higher IIFAS scores in our study. Mothers who introduced complementary foods after six months also had higher IIFAS scores than those who introduced them earlier. In contrast to the Jordanian study, we observed a significant negative correlation between early breastfeeding initiation and IIFAS scores, with mothers who initiated breastfeeding later showing lower scores.

Studies have shown that breastfeeding is most commonly continued during the first three months (20). Mothers discontinue breastfeeding for various reasons, including insufficient milk supply, infant latching difficulties, nipple pain, mode of delivery, and maternal health problems such as obesity or depression (7,8,10,15,16,18,19). Social factors such as lack of support, return to work, and the perception that the infant is not satisfied with breast milk alone also contribute to breastfeeding cessation (7,16,18,20–22). Similar reasons were reported in our study. However, maternal psychological status, body weight, and body mass index were not assessed. Although approximately three-quarters of the mothers were presumed to have had previous breastfeeding experience, this experience was not specifically assessed. Likewise, mothers' willingness or motivation to breastfeed was not investigated. Regarding influences on mothers' decisions to breastfeed, healthcare professionals were cited in 41.1% of cases, followed by older family members in 36.1% and the media in 21%. Paternal support was reported in only approximately 1.6% of cases. These findings should be interpreted with caution, as the study was conducted at a single center and included a limited sample size. Although the decision to initiate formula feeding was generally made by the family, approximately one-quarter of mothers reported that formula was introduced upon a physician's recommendation. In addition, prenatal breastfeeding education provided by healthcare professionals and exposure to Baby-Friendly Hospital practices were not assessed. These unmeasured factors may also have influenced breastfeeding attitudes and duration. Personal factors, in addition to health-related factors, may influence breastfeeding attitudes, as suggested by higher IIFAS scores among mothers with longer breastfeeding durations.

In a study conducted in Japan among mothers of infants younger than 18 months, IIFAS results indicated that. However, most mothers were aware of the benefits of breastfeeding, but they held more positive attitudes toward formula feeding

(23). Positive attitudes toward formula were also observed among the mothers in our study for various reasons. Educating mothers about the benefits of breastfeeding and breast milk before delivery may promote more positive attitudes toward breastfeeding.

Suppiger et al. (24) examined breastfeeding duration in Germany and found that it was not correlated with maternal age, education level, or employment status. They also found that preterm birth and higher IIFAS scores were associated with breastfeeding duration.

Our finding that higher maternal education was positively associated with IIFAS scores is consistent with the literature; previous studies have also reported positive correlations between maternal educational attainment and IIFAS scores (10,21). These findings suggest that maternal education is among the variables associated with infant feeding attitudes, although employment status may confound this association.

When we examined the association between maternal employment status and breastfeeding attitudes, employed mothers had significantly lower median IIFAS scores than non-employed mothers. In contrast, a study conducted in Qatar found that employed mothers had higher scores. One study reported that inadequate support and unsupportive workplace management were associated with an approximately eightfold reduction in positive breastfeeding attitudes (25). Tsai et al. (25) reported that 39% of employed mothers stopped breastfeeding within the first month after returning to work.

Several mechanisms may explain this association. Structural barriers such as the lack of dedicated lactation rooms, time constraints, and difficulty maintaining regular pumping schedules may reduce the perceived feasibility of continued breastfeeding among employed mothers (25). Occupational stress may also suppress oxytocin release and reduce prolactin levels, thereby compromising milk production; relaxation interventions intended to reduce this effect have been associated with improved breastfeeding outcomes (22). Another possible explanation is the "intention–behavior gap" in which positive attitudes toward breastfeeding do not translate into sustained breastfeeding when structural workplace barriers persist (25). These findings highlight the importance of workplace lactation policies, flexible scheduling, and institutional support as modifiable factors that may help employed mothers maintain more positive infant feeding attitudes and practices.

Several randomized controlled trials and meta-analyses have shown that relaxation therapies can increase breast milk volume. This effect is thought to result from decreased maternal stress and more efficient oxytocin release during

lactation (22). Therefore, providing mothers with a calm, and low-stress environment may improve the hormonal processes that support lactation. Given the positive association between higher IIFAS scores and longer breastfeeding duration, improving mothers' breastfeeding knowledge and strengthening their motivation may help sustain breastfeeding.

To the best of our knowledge, few studies have directly addressed this specific issue. Previous research has largely focused on the antenatal period and the first six months postpartum, whereas our study aimed to explore the underlying reasons for early weaning. Support from healthcare professionals, beginning during the antenatal period and continuing after birth, with a clear emphasis on the importance of breastfeeding, may help prevent early weaning and enable mothers to breastfeed for longer.

Limitations

The main limitations of this study are its cross-sectional design, which precludes causal inference and allows only associations to be identified, and its single-center setting, which limits the generalizability of the findings. In addition, participants were recruited from the pediatric outpatient clinics of a single hospital, and mothers attending child health clinics may differ systematically from mothers in the general population in health-seeking behavior, access to lactation support, and infant feeding attitudes. The predominantly positive attitudes observed in this study may therefore overestimate mothers' attitudes in the wider community. This further limits the external validity of our findings. Having a single interviewer conduct all face-to-face surveys ensured that questions were delivered and responses were recorded consistently. However, the presence of family members or others during the interviews may have influenced the mothers' responses. Several additional important limitations should be acknowledged. First, recall bias is a concern. Mothers of infants aged 6–24 months provided retrospective information about early breastfeeding practices, and memory errors may have affected the accuracy of the reported timing of these practices. Because the recall interval increases with age, misclassification is likely greatest for the earliest events, particularly the timing of breastfeeding initiation, the introduction of formula, and the reported duration of exclusive breastfeeding. If such misclassification was non-differential with respect to maternal attitudes, it would be expected to attenuate the observed correlations toward the null. However, differential recall due to socially desirable responding cannot be ruled out. Therefore, the observed associations between IIFAS scores and breastfeeding duration should be interpreted with caution. Second, social desirability bias may have inflated IIFAS scores or the reported duration of breastfeeding, particularly because the scale was administered face-to-face. Third, a multivariable linear regression model was used to examine the independent associations of maternal education and employment status with IIFAS scores. However, several other potentially relevant determinants of breastfeeding attitudes — including maternal intention to breastfeed, prenatal breastfeeding education, partner support, Baby-Friendly Hospital practices, postpartum depression, maternal body mass index, and previous breastfeeding experience — were not assessed and therefore

could not be included in the model. Future studies with larger samples should include these variables.

Fourth, the IIFAS is a self-report measure of attitudes and may not fully reflect actual breastfeeding behavior.

Fifth, a formal a priori power analysis was conducted. However, post hoc calculations showed that, with $n=305$ and the smallest observed correlation of $r=0.12$, the achieved power was approximately 0.60 for a two-tailed test at $\alpha=0.05$. This value is below the conventional power threshold of 0.80, limiting the conclusions that can be drawn about smaller effect sizes.

Conclusion

Our findings indicate that maternal attitudes toward breastfeeding, as measured by the IIFAS, are primarily associated with educational background and employment status. In addition, lower IIFAS scores may be associated with earlier breastfeeding cessation. Appropriate support and counseling to from healthcare professionals may help mothers breastfeed longer. These results should be viewed as hypothesis-generating. Whether educational initiatives and workplace policies that support lactation improve breastfeeding practices should be tested in prospective, and ideally interventional, studies. Counseling targeting mothers with lower educational attainment and those intending to return to work may be an appropriate focus of such studies. Further research should also examine whether involving family members, including spouses and extended family, in breastfeeding education leads to more positive attitudes and practices.

Ethics committee approval

This study was conducted in accordance with the Helsinki Declaration Principles. The study was approved by Prof. Dr. Cemil Taşcıoğlu City Hospital (August 14, 2023, reference number: 134).

Contribution of the authors

Study conception and design: AN, YT; data collection: AN; analysis and interpretation of results: AN, YT, BA; draft manuscript preparation: AN, BA. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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