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ORIGINAL RESEARCH

The Relationship Between Infant Feeding Attitudes of Mothers in the Postpartum Period and Neonatal Jaundice Transcutaneous Values

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ABSTRACT

The study was conducted to determine the relationship between mothers' infant feeding attitude behaviors and neonatal jaundice transcutaneous values in the postpartum period. The correlational-descriptive study was completed with 330 mothers who gave birth in the obstetrics and gynecology service of a hospital in the Eastern Anatolia Region and met the criteria. Data were collected using Personal Information Form, Iowa Infant Feeding Attitude Scale (IIFAS) and Transcutaneous Bilirubin (TcB) Meter. SPSS 26.0 program was used for data analysis. The mean total score of the mothers on the IBBTS was 64.00±5.495. The mean TcB value of newborns was found to be 1.95±1.044. There was no statistically significant correlation between the mean score of the Infant Feeding Attitude Scale and TcB values ($p>0.05$). It was determined that mothers who received breast milk and breastfeeding education had a lower mean TcB value and mothers living in nuclear families had a higher mean TcB value ($p<0.05$). It was found that the mean Infant Feeding Attitude score was higher in mothers with higher education, working mothers, mothers living in urban areas, mothers with older age, mothers with high and medium income levels ($p<0.05$). As a result, it was determined that mothers had a positive attitude towards breastfeeding, the mean TcB value was low, and therefore the rate of follow-up with jaundice risk was very low. The fact that the risk of jaundice was lower in the infants of mothers who received breast milk and breastfeeding education draws attention to the importance of education and awareness. In addition, it was determined that mothers with high infant feeding attitude scores breastfed their babies more frequently. Adequate nutrition of the newborn should be ensured to prevent neonatal hyperbilirubinemia.

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Introduction

Raising physically healthy generations for the future has always been a principle that has always been considered and aimed for. The most important steps of the principle of healthy generation are vaginal delivery and breastfeeding of the newborn as soon as possible. Breastfeeding is one of the sacred maternal roles that enables the mother to develop a sense of motherhood and creates a very strong bond between mother and baby (Çaka et al., 2017; Ağar et al., 2023). Breastfeeding and newborn feeding are extremely beneficial for both mother and baby and have many positive effects on developmental, psychological, immune, economic and social aspects, especially on newborn nutrition (Cambaz, 2020; Akhaldi et al., 2023; Zhang et al., 2024). However, inadequate breast milk causes postnatal hyperbilirubinemia and dehydration as a result of inadequate nutrition of the baby. This leads to delayed meconium passage and increased reabsorption of bilirubin through the enterohepatic circulation due to inadequate nutrient intake in the newborn and jaundice develops in the infant. Jaundice is one of the most common clinical findings in newborns requiring medical attention, care and close observation (Özdemir and Yılmaz, 2019; Thomas et al., 2022). “Jaundice” literally means the yellow coloration of the skin and sclera as a result of the accumulation of bilirubin in the skin and mucous membranes. The main cause of this condition is elevated bilirubin levels in the blood, a condition defined as “hyperbilirubinemia” (Gebrehana Belay et al., 2022; Ansong-Assoku et al., 2024). Bilirubin is a substance with neurotoxic potential. Due to its lipophilicity, free bilirubin (not bound to albumin) can cross the blood-brain barrier, resulting in bilirubin-induced neurologic dysfunction (BIND), mild and indeterminate neurologic disorders (such as hearing loss, motor and cognitive impairments, mild mental retardation), acute bilirubin encephalopathy (ABE) and chronic sequelae. The most affected areas are the basal ganglia and the nuclei of the oculomotor and auditory pathways in the brainstem (Prameela, 2019; Üstün, 2019; Eghbalian et al., 2022). Therefore, follow-up and treatment of jaundice has an important place. Monitoring and diagnosis of neonatal jaundice is performed by assessing bilirubin levels with a transcutaneous bilirubin meter or by evaluating blood samples for total serum bilirubin (Ansong-Assoku et al., 2024).

Neonatal jaundice is a global health problem. The health goals of the United Nations' “Sustainable Development Goals” emphasize the chances of survival, growth and long-term well-being of all newborns. The most important step in achieving these goals is a healthy start to life. For a healthy start to life, the newborn should be breastfed within the first 30 minutes after birth.

In the literature review, it is noteworthy that the studies on the relationship between the mother's infant feeding attitude behavior in the postpartum period and jaundice transcutaneous values in our country and abroad are very limited. Therefore, it was aimed to determine the relationship between infant feeding attitude behavior and jaundice transcutaneous values of mothers in the first 12 hours postpartum.

Material and Methods

Type of Research

The research was carried out in a correlational-descriptive type.

Population and Sample of the Study

The population of the study consisted of married women (N=1922) who had live vaginal deliveries in the 12th hour postpartum in the Obstetrics and Gynecology services of a State Hospital affiliated to the Provincial Health Directorate in the Eastern Anatolia Region. The number of women to be sampled was calculated with the help of the formula (p: 0.5, q: 0.5, t: 1.96, d: 0.05) used when the frequency of the event is to be examined in cases where the universe is certain and the minimum number was found to be 320.

Inclusion Criteria

- She gave birth at term,
- She had a vaginal delivery,
- Breastfeeding has started,
- The baby's absence in the intensive care unit,
- Maternal blood type is not O Rh (±),
- No Rh incompatibility,
- Not having a baby with congenital anomalies
- Skin color is not dark.

Data Collection Tools

Data were obtained by using Personal Information Form, Iowa Infant Feeding Attitude Scale (IIFAS) and Transcutaneous Bilirubin Meter.

Personal information form: The form includes questions about socio-demographic characteristics (age, education level, family income, etc.) and obstetric characteristics (number of children, etc.). The form consists of two open-ended and nine closed-ended questions, totaling 11 questions.

Iowa Infant Feeding Attitude Scale (IIFAS): Originally named IIFAS (Iowa Infant Feeding Attitude Scale), the scale was developed by De La Mora and Russell in 1999 to estimate women's attitudes towards breastfeeding and duration of breastfeeding. The scale has a scoring ranging from 1 (strongly disagree) to 5 (strongly agree), a 5-point Likert-type scale and a total of 17 items. Eight items in the scale include statements about formula feeding and nine items include statements about breastfeeding. The scoring of formula feeding items is reverse scoring. The total attitude score ranges between 17 and 85, with a low score indicating that the mother has a positive attitude towards bottle feeding and a high score indicating a positive attitude towards breastfeeding. The Turkish validity and reliability of the scale was conducted

by Ekşioğlu et al. The Cronbach Alpha internal consistency coefficient of the scale was found to be 0.71. In this study, the Cronbach Alpha internal consistency value of the scale was found to be 0.608 and it was determined to be quite reliable.

Transcutaneous bilirubin measurement device: It is a device used to measure the total bilirubin value on the skin surface in newborn infants (Aslan, 2015). MBJ20 model transcutaneous bilirubinometer was used in the study. The transcutaneous bilirubinometer, which measures total bilirubin (TcB) on the skin surface, emits light only on the skin with a noninvasive method in infants and obtains the result by looking at three regions separately. Therefore, it provides painless, effective and rapid results by measuring bilirubin without the risk of infection and is used in newborn jaundice screening (Chua et al., 2021). According to the Turkish Neonatology Society Guidelines, the follow-up of the newborn in the hospital is between 8-12 hours. Jaundice is evaluated and monitored according to the nomogram created to determine the risk status of infants according to postnatal age and total bilirubin values. According to the nomogram evaluation, a TcB value of 4 mg/dl and above or above the 75th percentile in newborns older than 35 weeks of gestation and in the first 24 hours requires TSB follow-up. A diagnosis of direct (conjugated) hyperbilirubinemia is made if the TSB level is above the 95th percentile in the first 24 hours or if direct bilirubin is above 1 mg/dL when TSB is below 5 mg/dL according to postnatal age or if direct bilirubin is more than 20% of total bilirubin when TSB is above 5 mg/dL (Uz, 2020; Derneği, 2022).

Application

In the application phase of the study, transcutaneous bilirubin (TcB) values were measured in healthy newborn infants who were with their mothers at the 12th hour after birth based on the clinical practice guidelines of the Turkish Neonatology Society. The institution where the study was conducted is a state hospital and routine TcB measurements are performed in newborns in accordance with the physician's request. During the routine measurements, care was taken to ensure that there was no erythema, redness or irritation on the skin areas where the device was applied, i.e. above the glabella, midline of the sternum and abdomen, and the infants were kept calm during the measurements. The device was carefully placed on the surface of these three areas and the TcB values obtained as a result of light emission were recorded. In order to increase the reliability of the data and to standardize the measurements, all applications were performed using the same device and by the same trained personnel, and the TcB values obtained were recorded under appropriate conditions and the data were collected.

Statistical Analysis

The research data were transferred to IBM SPSS Statistics 26 (IBM, Armonk, NY, USA) and the analysis was completed. While evaluating the data, frequency distributions were given for categorical variables and descriptive statistics (mean, standard deviation, minimum, maximum) were given for numerical variables. The reliability of the Infant Feeding Attitude Scale used as a measurement tool in the study was examined with Cronbach's Alpha internal consistency coefficient. The infant feeding attitude scores of the mothers participating in the study were obtained by summing the relevant items. In order to decide on the analyses to be applied, the Kolmogorow Smirnov Test was applied for the assumption of normal distribution. As a result of the test, it was seen that the infant feeding attitude score met the assumption of normal distribution. Therefore, parametric tests were used in the comparisons. Independent Sample t Test was used between two independent groups. Whether there was a difference between more than two independent groups according to the infant feeding attitude score was examined by One-Way Analysis of Variance (ANOVA) and the difference between which groups was examined by Tukey Test. Pearson Correlation Coefficient was used to determine the degree of non-causal relationships between two quantitative variables.

Ethical Aspects of the Research

This study was conducted in accordance with the Declaration of Helsinki. Written permission was obtained from the Non-Interventional Clinical Research Ethics Committee of a university (2023-07/16), the Health Directorate of a province in the Eastern Anatolia Region (18.08.2023-E39320161-602.01.01-222390081) and the State Hospital where the study was conducted. Participation in the study was based on volunteerism. The mothers who participated in the study were explained about the purpose of the study, the process and the forms, and written informed consent was obtained.

Results

Throughout history, for example in Mesopotamia and Ancient Greece, breastfeeding and breast milk have been celebrated, and there are numerous references to breastfeeding and breast milk in mythology. In the Middle Ages, it was believed that breast milk transmitted the physical and psychological characteristics of the breastfeeding woman to the infant; therefore, it was argued that breastfeeding was the duty of mothers and the practice of wet nurse was encountered for the first time. During the Renaissance Period, articles on child health advocated breastfeeding (Yılmaz and Yüksel, 2021). Numerous studies conducted in our country and abroad have proven the positive effect of breast milk on infant and maternal health. However, it has been observed that there are very limited studies on the relationship between mother-infant feeding attitude and neonatal jaundice transcutaneous values. Neonatal jaundice is one of the most common clinical problems in the neonatal period. Hyperbilirubinemia or jaundice, which is determined by high bilirubin levels in the blood, affects approximately 60% of term infants and 80% of preterm infants (Gao et

al., 2023; Liu et al., 2025). Despite advances in the care and management of hyperbilirubinemia, the condition remains a major cause of neonatal morbidity and mortality. In low- and middle-income countries, neonatal jaundice is a serious health care burden and accounts for a significant proportion of global child mortality and morbidity (Belay et al., 2022). Despite recent advances in neonatal health, some health system-based problems still persist. Considering these problems, conditions such as high rates of cesarean delivery, very early discharge (<24 hours) after delivery, and follow-ups exceeding 48 hours after discharge have a negative impact on maternal health and make follow-up and treatment of neonatal jaundice difficult. All newborns should be examined at regular intervals and bilirubin levels should be measured in infants with jaundice symptoms (Vázquez-Vázquez et al., 2022). Following mother-infant pairs at increased risk for neonatal jaundice in both prenatal and postnatal periods and intervening earlier is an important factor in reducing severe neonatal jaundice (Ayalew et al., 2024).

Among the mothers who participated in the study, 39.3% (n=118) were 17-24 years old, 33.9% (n=112) were 25-29 years old, and 30.3% (n=100) were 30 years and older. While 7.3% (n=24) of the mothers were illiterate, 2.7% (n=9) were literate, 28.2% (n=93) were primary school graduates, 28.2% (n=93) were secondary school graduates, 23.0% (n=76) were high school graduates, and 10.6% (n=35) were college graduates. Only 4.2% (n=14) of the mothers were employed, while 95.8% (n=316) were unemployed/homemakers. While 35.2% (n=116) of the mothers had low income, 62.1% (n=205) had medium income and 2.7% (n=9) had high income. Therefore, it was determined that 97.3% of the mothers had low and medium economic status. 25.5% (n=84) of the mothers had 1 child, 29.4% (n=97) had 2 children, 23.3% (n=77) had 3 children, and 21.8% (n=72) had 4 or more children. Of the mothers, 68.8% (n=227) were nuclear families and 31.2% (n=103) were extended families. While 35.8% (n=118) of the mothers lived in rural areas, 64.2% (n=212) lived in urban areas (Table 1).

The mean IIFAS score of the mothers was found to be 64.00 (±5.495) (Table 2). Accordingly, in our study, it was determined that the mean total score of the IIFAS was high, and it was concluded that the high total score of the scale indicated that mothers had a positive attitude towards breastfeeding. Güler et al. (2022) conducted a study on 177 mothers in a state hospital and found that the mean score of IIFAS was 56.41 (8±7.22). In a study conducted by Akın et al. (2021) on mothers with 0-6-month-old infants, the mean IIFAS score was 61.57 (±5.34). In a study conducted by Kanber and Beydağ (2023) on 244 mothers with 0-6-month-old infants, the mean IIFAS score was found to be 63.63 (±5.77). Akça and Bayrakçı (2024) conducted a study on lactating mothers and found the mean IIFAS score to be 63.45 (±7.98). Baransel et al. (2023) found the mean IIFAS score to be 46.47 (±5.09) in a study on the provision and maintenance of successful breastfeeding. Albayrak et al. (2022) conducted a study on 336 mothers in Turkey to examine the effect of infant gender on mothers' breastfeeding attitudes and duration and found that the mean IIFAS score was 63.54 (±7.01). Savaş et al. (2024) In a study on the effect of breastfeeding education based on psychosexual development theory on the nutritional attitudes and behaviors of primiparous mothers, the mean IIFAS score was found to be 66.31 (± 5.72). In a study conducted by Han et al. (2023) on the postpartum relationship of mothers' breastfeeding attitudes, the mean IIFAS score for postpartum women was found to be 62.5 (± 6.50). It is seen that our study result is similar to the results of this study. It can be said that mothers have a positive attitude in breastfeeding the newborn and are advantageous groups.

Table 1. Distribution of mothers according to their socio-demographic characteristics, baby feeding and education status.

	Number of People (N=330)	Percentage (%)
Age Group		
17-24 age	118	35.75
25-29 age	112	33.95
30 age and older	100	30.3
Education Status		
Not literate	24	7.3
Literate	9	2.7
Primary education	93	28.2
Secondary education	93	28.2
High school	76	23.0
Higher education	35	10.6
Employment Status		
Yes	14	4.2
No	316	95.8
Income Level		
Low	116	35.2
Middle	205	62.1
High	9	2.7
Number of Children		
1 Children	84	25.5
2 Children	97	29.4
3 Children	77	23.3
4 Child and above	72	21.8
Family Type		
Nuclear family	227	68.8
Extended family	103	31.2
Place of Residence		
Rural area	118	35.8
Urban area	212	64.2
Breastfeeding Frequency		
Every time you cry	136	41.2
1 every hour	122	37.0
2 every hour	67	20.3
3 every hour	5	1.5
Anything Other Than Breast Milk The State of Giving a Nutrient		
Yes	61	18.5
No	269	81.5
Breast Milk and Breastfeeding Education Status		
Yes	142	43.0
No	188	57.0

Discussion

When studies conducted abroad are examined, it is seen that women in Spain, the UK and Canada have a positive attitude towards breastfeeding, while Fiji has a more negative attitude. Naja et al. reported that only 9.5% of women in Qatar and Lebanon had a positive attitude towards breastfeeding. Alkhalde et al. (2023) conducted a study to determine the nutritional attitudes of mothers in Jordan and found that the mean score of IIFAS was 65.0 ± 7.15. It is thought that the reason for the difference in breastfeeding attitudes of mothers in the studies is due to the different socio-cultural characteristics such as religious beliefs of the society and region where the study was conducted.

In our country, management of jaundice is performed according to the Guidelines of the Turkish Neonatology Society. In the guideline, TcB, Total Serum Bilirubin (TSB) level is evaluated and monitored using a nomogram created to determine the risk status of infants according to postnatal age and total bilirubin values. A newborn TcB value of 4 mg/dl and above in the first 24 hours requires TSB monitoring. A diagnosis of direct (conjugated) hyperbilirubinemia is made if the TSB level is above the 95th percentile in the first 24 hours or if direct bilirubin is above 1 mg/dL when TSB is below 5 mg/dL according to postnatal age or if direct bilirubin is more than 20% of total bilirubin when TSB is above 5 mg/dL (Uz, 2020; Derneği, 2022). In our study, the mean TcB score of the newborn was found to be 1.95±1.044 in the evaluation we performed using nomograms (Table 2). According to these results, there was no risk of hyperbilirubinemia in newborns.

Table 2. Investigation of the relationship between infant feeding attitude score, age and transcutaneous bilirubin value at 12 hours and TcB value according to infant feeding attitude score

Measurements	Mean±SD	Median	Min-Max
Infant Feeding Attitude	64.00±5.495	64	50-81
Transcutaneous Bilirubin Value (TcB)	1.95±1.044	1.80	0.2-6.1
		TcB	
Attitude To Infant Baby Feeding	r	-0.037	
	p	0.500	

***p<0.05, r= Pearson Correlation Coefficient, p=Significance Level*

Successful and adequate breastfeeding is the primary prevention of jaundice and the primary protection in the management of jaundiced infants. Successful breastfeeding is defined as “an interactive process that results in mutual satisfaction of the needs of the infant and the mother”. Successful breastfeeding is realized through the implementation of the “Ten Steps to Successful Breastfeeding” recommended by WHO and UNICEF. Breast milk and breastfeeding education is of great importance for the full implementation of the ten steps. In this way, the health service required for the mother to obtain sufficient information, to trust that her milk is sufficient for her baby and to continue breastfeeding is provided. Otherwise, when the mother cannot breastfeed her baby effectively and successfully, the baby cannot get enough breast milk and the calories it needs (Özdemir and Yılmaz, 2019). This causes early-onset breast milk jaundice and the underlying mechanism is malnutrition. Therefore, malnutrition in the newborn causes increased reabsorption of bilirubin in the intestine through the enterohepatic circulation, which first causes jaundice in the infant and poses a great risk for weight loss, dehydration and malnutrition. The mean Infant Feeding Attitude score of the mothers who participated in our study was found to be high and it was determined that they had a positive attitude towards breastfeeding and therefore the mean transcutaneous bilirubin value in the newborn was low as a result of adequate nutrition. Although there was no statistically significant difference between the Infant Feeding Attitude score and Transcutaneous bilirubin values, the fact that the TcB value was lower in the infants of mothers who received breast milk and breastfeeding education and that there was a relationship between them (p<0.05) (Table 4) draws attention to the importance of nutrition. Killelea et al. (2022) determined that nutrition should be optimized especially against the problem of conjugated hyperbilirubinemia in newborns with conjugated hyperbilirubinemia. Ke K et al. (2024) included a total of 2,577 infants born between 2017 and 2021 and concluded that inadequate breastfeeding may increase the potential risk of neonatal jaundice in infants. Hui et al. (2024) found that neonatal jaundice was not seen in exclusively breastfed infants and that the healthcare burden could be prevented with successful breastfeeding promotion. In a study conducted by Ma et al. (2020) to evaluate the jaundice outcomes of low birth weight premature infants who started nutritional supplementation earlier or later, it was determined that nutritional supplementation in the presence of insufficient breast milk in the early period improved jaundice outcomes by increasing bilirubin excretion/elimination. Nilsson et al. (2017) found that effective and frequent breastfeeding reduced bilirubin levels in a study involving 2,065 mothers in the intervention and 1,476 mothers in the control group in Denmark. (2022) found that breast milk nutrition support program decreased hospitalization rates due to hyperbilirubinemia. Study results show that nutrition is effective in minimizing jaundice. In our study, positive breastfeeding attitudes of mothers and feeding newborns with breast milk every time they cry, every hour and every two hours indicate that the risk of jaundice is low. The fact that the TcB values of the newborns of mothers who received breast milk and breastfeeding education were lower and there was a relationship between them (Table 4) draws attention to the importance of nutrition.

A statistically significant difference was found between the nutritional attitude scores of the mothers according to age groups (p<0.05). It was found that the

positive attitude towards breastfeeding increased as the age of the mothers increased (Table 3). Adegbayi et al. (2023) conducted a study in Nigeria and found that the mean score of IIFAS increased with increasing age. Iliadou et al. (2019) found that 203 women in Greece had a positive attitude towards breastfeeding with increasing age. In a study conducted by Mohd Shukri et al. (2021) on primiparous mothers, it was determined that there was a more positive attitude towards breastfeeding as age increased. It is thought that the knowledge and experience gained with increasing age leads to a positive attitude towards breastfeeding.

Table 3. Comparison of infant feeding attitude score and transcutaneous bilirubin value according to socio-demographic and obstetric characteristics of mothers

		Attitude to Infant Baby Feeding		TcB	
	N	Average	Std. Deviation	Average	Std. Deviation
Age Group					
17-24 age	118	63.03	5.128	1.91	0.948
25-29 age	112	64.38	5.601	1.93	1.092
30 age and older	100	64.72	5.682	2.01	1.103
F; p		2.986; **0.049***		0.302; 0.740	
Family Type					
Nuclear family	227	64.44	5.714	2.04	1.075
Extended family	103	63.03	4.864	1.73	0.939
t; p		2.172; **0.031***		2.566;**0.011***	
Place of Residence					
Rural area	118	62.43	4.976	1.82	1.040
Urban area	212	64.87	5.587	2.01	1.042
t; p		3.948;**0.000*****		-1.586;0.114	
Education Status					
Literate	33	61.47	6.974	1.95	1.245
Primary education	93	63.09	4.852	2.00	0.981
Secondary education	93	63.65	5.031	1.80	0.898
High school	76	64.93	4.839	2.14	1.220
Higher education	35	67.73	6.118	1.74	0.899
F; p		7.642; **0.000*****		1.513; 0.198	
Difference		1,2,3-5 1-4		-	
Employment Status					
Yes	14	66.89	6.122	2.01	0.970
No	316	63.87	5.441	1.94	1.048
t; p		2.018; **0.044***		0.251;0.802	
Income Level					
Low	116	62.42	5.598	1.91	1.017
Middle/ Hıgh	214	64.86	5.256	1.96	1.060
t; p		3.926;**0.000*****		0.420;0.674	
Number of Children					
1 Children	84	63.77	5.000	2.12	1.142
2 Children	97	65.17	5.769	1.94	0.986
3 Children	77	63.80	5.367	1.80	0.992
4 Children and above	72	62.91	5.629	1.90	1.046
F; p		2.522; 0.058		1.338;0.262	

**p<0.05. ***p<0.001. t= Independent Sample T Test, F=One-Way Analysis of Variance (ANOVA), Difference=Tukey Test, p=Significance Level*

It was observed that there was a statistically significant difference between the mean Infant Feeding Attitude scores of mothers according to their educational status (p<0.05). It was found that the mean Infant Feeding Attitude score of mothers with higher education was significantly higher than the mean scores of literate, primary school graduates and secondary school graduates, and the mean Infant Feeding Attitude score of mothers with high school graduates was significantly higher than the mean score of literate mothers (Table 3).Statistical analyses revealed that mothers with higher education levels had more positive attitudes towards infant feeding than mothers with lower education levels. In the study conducted by Akça and Bayrakçı (2024), it was determined that the infant feeding attitudes of mothers with higher education level were significantly higher. Akın et al. (2021) found that the mean score of the Infant Feeding Attitude Scale was higher in women with undergraduate and graduate degrees compared to other women. In a study conducted by Bień et al. (2021) on

Polish women, it was concluded that women with primary education had low infant feeding attitudes. In a study conducted by Kurtbeyoğlu and Caferoğlu Akın (2023), it was found that the feeding attitude scores of mothers with high school and university graduates were higher than those of mothers with primary school graduates.

It was found that there was a statistically significant difference between the mean Infant Feeding Attitude score according to the working status of the mothers ($p<0.05$). It was determined that the mean Infant Feeding Attitude score of working mothers was significantly higher than the mean score of non-working mothers ($p<0.05$, Table 3).

In a study conducted by Akça and Bayrakçı (2024), infant feeding attitudes of mothers who were employed in any job were found to be significantly higher. Chaabna et al. (2022) investigated the attitudes of Muslim women in Qatar towards infant feeding and found that women who worked full-time or part-time had significantly higher scores than those who did not work. In a study conducted by Akın et al. (2021) to determine the attitudes of mothers with 0-6-month-old infants towards infant feeding and the duration of transition to complementary feeding, it was determined that 24.5% of the mothers were employed and the mean scale score of working mothers was significantly higher than that of non-working mothers.

It was found that there was a statistically significant difference between the mean Infant Feeding Attitude score according to the income level of the mothers ($p<0.05$). Accordingly, it was determined that the mean Infant Feeding Attitude score of mothers with medium or high income level was significantly higher than the mean score of mothers with low income level (Table 3). Tandoğan et al. (2024) on the relationship between mothers' breastfeeding experiences, infant feeding attitudes and perceived social support in the postpartum period, it was found that the mean infant feeding attitude score of mothers whose income was higher than expenses was higher. Mohd Shukri et al. (2021) conducted a study on the differences in maternal characteristics and their relationship with breastfeeding attitudes in primiparous mothers and found that the general IIFAS score was positively correlated with household income. Alkhaldi et al. (2023) showed that the total attitude score towards breastfeeding was significantly higher in women with higher income levels. Arifunhera et al. (2015) conducted a study to evaluate the relationship between maternal anxiety and nonadherence to exclusive breastfeeding and found that lower per capita income was associated with lower mean scores on the Iowa Infant Feeding Attitude Scale. In another study conducted in Indonesia, Awaliyah et al. (2019) reported that mothers with high household income and working mothers had higher mean IIFAS scores.

It was observed that there was a statistically significant difference between the mean TcB value according to the family types of the mothers ($p<0.05$). Accordingly, it was found that the mean transcutaneous bilirubin value of mothers with nuclear families was significantly higher than the mean TcB value of mothers with extended families (Table 3). The fact that the mothers lived in extended families was thought to be the reason for the low transcutaneous bilirubin value due to the presence of experienced people who could help them breastfeed their babies and the provision of support for breastfeeding.

It was observed that there was a statistically significant difference between the mean scores of Infant Feeding Attitude according to where the mothers lived ($p<0.05$). Accordingly, the mean Infant Feeding Attitude score of mothers living in urban areas was significantly higher than the mean score of mothers living in rural areas (Table 3). In a study conducted by Mohd Shukri et al. (2021) on the differences in maternal characteristics and their relationship with breastfeeding attitudes in primiparous mothers, it was proved that the infant feeding attitude of mothers living in urban areas was more positive. It was thought that the higher likelihood of urban residents to benefit from the service may be the reason for this advantage.

It was observed that there was a statistically significant difference in the mean Infant Feeding Attitude score according to the breastfeeding frequency of the mothers ($p<0.05$). It was determined that mothers who breastfed more frequently had a positive attitude towards infant feeding and breastfeeding (Table 4). Nilsson et al. (2017) found that hospitalization due to jaundice was less frequent in newborns who were breastfed frequently. In the study conducted by Toksöz et al. (2023) to determine the breastfeeding attitudes and influencing factors of mothers who breastfed their 0-6-month-old babies during the Covid-19 pandemic period, it was found that there was a significant difference between the frequency of breastfeeding and the mean Infant Feeding Attitude score, and it was determined that mothers who breastfed more frequently had a positive attitude towards infant feeding and breastfeeding.

There was a statistically significant difference between the mothers' breastfeeding and breastfeeding education status according to the mean TcB value ($p<0.05$). Accordingly, it was found that the mean TcB value of mothers who received breastfeeding and breastfeeding education was significantly lower than the mean transcutaneous bilirubin value of mothers who did not receive breastfeeding and breastfeeding education (Table 4). It is thought that the transcutaneous bilirubin value of the newborn did not increase as a result of adequate nutrition because the mothers who received breastfeeding and breastfeeding education obtained sufficient information and trusted that their milk could be sufficient for their baby, which enabled the mother to maintain a positive attitude towards feeding her baby, self-efficacy and breastfeeding. Akın et al. (2021) meta-analyses on breastfeeding education and support have shown that breastfeeding education and/or support can effectively increase breastfeeding rates and duration. Thus, it is thought that the total bilirubin value is low as a result of the fact that the trained mother can feed her baby sufficiently.

Table 4. Comparison of infant feeding attitude score and transcutaneous bilirubin value according to breastfeeding behaviors of mothers

		Attitude to Infant Baby Feeding		TcB	
	N	Average	Std. Deviation	Deviation	Std. Deviation
Breastfeeding Frequency					
Every time you cry	136	64.62	5.531	1.83	1.078
1 every hour	122	63.60	5.201	2.05	1.078
2 every hour	72	63.51	5.863	1.95	0.907
3 every hour	5	56.11	4.017	2.32	0.829
F; p		4.375; **0.005****		1.157; 0.326	
Difference		1,2,3-4		-	
Anything Other Than Breast Milk the State of Giving a Nutrient					
Yes	61	64.26	4.977	2.11	1.278
No	269	63.94	5.613	1.91	0.981
t; p		0.410; 0.682		1.335; 0.183	
Breast Milk and Breastfeeding Education Status					
Yes	142	63.99	5.236	1.80	1.053
No	188	64.01	5.696	2.05	1.027
t; p		-0.028; 0.978		-2.143; **0.033***	

**p<0,05, **p<0,01, ***p<0,001, t= independent Sample T Test, F=One-Way Analysis of Variance (ANOVA), Difference=Tukey Test, p=Significance Level*

Conclusion

As a result of this study, it was determined that mothers had positive attitudes towards breast milk and breastfeeding. It was found that the mean TcB value of mothers who received breastfeeding and breastfeeding education was significantly lower than the mean transcutaneous bilirubin value of mothers who did not receive education.

It was determined that mothers exhibited positive attitudes towards infant feeding as the level of education increased. It was found that the infant feeding attitude of mothers whose breastfeeding frequency increased was significantly higher. The infant feeding attitude of working mothers was found to be more positive than that of non-working mothers. The infant feeding attitude of mothers with medium or high income level was found to be significantly higher than the infant feeding attitude of mothers with low income level. It was determined that the mean TcB value of mothers with nuclear families was significantly higher than the mean TcB value of mothers with extended families. The infant feeding attitude of mothers living in urban areas was found to be significantly higher than the infant feeding attitude of mothers living in rural areas. Early follow-up, intervention and treatment are important in the postnatal period to reduce the morbidity and mortality risks in neonatal jaundice and to improve health, but adequate nutrition of the newborn should be ensured.

Declarations

Acknowledgments

Not Applicable.

Conflict of Interest

Within the scope of this research, the authors have no relationship of interest with any person or organization regarding the data presented and/or the subject of the research.

Ethics Statement

It was approved by the Non-Interventional Clinical Research Ethics Committee of Sivas Cumhuriyet University with reference number (2023-07/16).

Informed Consent

This study was conducted in accordance with the Declaration of Helsinki. Written permission was obtained from the Non-Interventional Clinical Research Ethics Committee of a university (2023-07/16), the Health Directorate of a province in the Eastern Anatolia Region (18.08.2023-E39320161-602.01.01-222390081) and the State Hospital where the study was conducted. Participation in the study was based on volunteerism. The mothers who participated in the study were explained about the purpose of the study, the process and the forms, and written informed consent was obtained.

Author Contributions

Conceptualization: NT; methodology: NT, ÖAD; software: NT, ÖAD; validation: NT, ÖAD; formal analysis: ÖAD; investigation: ÖAD; data curation: NT; writing-original draft: NT, ÖAD; writing-review&editing: NT, ÖAD; visualition: NT, ÖAD; supervision: NT; project administration: NT; funding acquisition: ÖAD.

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Data Availability

PubMed, Google Academic, Scopus, Elsevier, Dergi Park.

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