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NONFUNCTIONAL BELIEFS AND PRACTICES OF MOTHERS FOR BABY DIAGNOSED HYPERBILIRUBINAMIA AND FACTORS AFFECTING THE BILIRUBIN LEVEL: CROSS-SECTIONAL STUDY

HİPERBİLİRUBİNEMİ TANILI BEBEĞE YÖNELİK ANNELERİN FONKSİYONEL OLMAYAN İNANÇ VE UYGULAMALARI İLE BİLİRUBİN DÜZEYİNİ ETKİLEYEN FAKTÖRLER: KESİTSEL ÇALIŞMA

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ABSTRACT

Objective: This study aims to determine mothers' dysfunctional beliefs and practices regarding their newborn babies hospitalized in neonatal intensive care unit with diagnosis of hyperbilirubinemia, and factors affecting newborn's bilirubin level.

Methods: This cross-sectional study was carried out between 8 February and 31 August 2022. 175 mothers were included, Dysfunctional Beliefs and Practices for the Infant Scale (NBIAS) was used in the study.

Results: Mean NBIAS score of mothers was moderate (49.6±13.5). Mean NBIAS score of mothers differed significantly according to descriptive characteristics of mother and baby. Multiple regression analysis showed that applying phototherapy to infant negatively predicted mean NBIAS score of mothers, while the number of daily breastfeeding and giving birth at home predicted this mean positively. It was determined that newborn's bilirubin level was negatively predicted by baby's 5th minute APGAR score and mother's status of not receiving information/education about newborn care, and positively predicted by birth weight, number of days on phototherapy, first breastfeeding time after birth, and first postpartum measurement of bilirubin level. Most common traditional practices of mothers were tying a yellow cloth as swaddling or covering the baby with a yellow cloth (85.1%).

Conclusion: Breastfeeding is perceived as a traditional practice by mothers. Health workers should provide education and counseling to mothers about jaundice. Cultural practices of mothers to prevent jaundice in newborn should prevent harmful ones.

Keywords: Faith, Hyperbilirubinemia, Newborn, Traditional.

ÖZET

Amaç: Bu araştırmada yenidoğan yoğun bakım ünitesinde hiperbilirubinemi tanılı bebeği yatan annelerin hiperbilirubinemiye yönelik fonksiyonel olmayan inanç ve uygulamalarını ve bebeğin bilirubin seviyesini etkileyen faktörleri belirlemek amaçlanmıştır.

Gereç ve Yöntem: Kesitsel çalışma 8 Şubat ve 31 Ağustos 2022 tarihleri arasında yürütülmüştür. Araştırmaya 175 anne dahil edilmiştir, Çalışmada Fonksiyonel Olmayan İnanç ve Uygulamalar Ölçeği (NBIAS) kullanılmıştır.

Bulgular: NBIAS puan ortalaması orta düzeydedir (49.6±13.5). Anne ve bebeğin tanımlayıcı özelliklerine göre NBIAS pua ortalaması arasında anlamlı farklılık saptanmıştır. Çoklu regresyon analizinde annelerin NBIAS puan ortalaması üzerine bebeğe fototerapi uygulanmasının negatif; evde doğum yapma, bebeğin günlük emzirilme sıklığının pozitif etkili olduğu belirlenmiştir. Bebeğin bilirubin düzeyi üzerine bebeğin 5.dk APGAR skoru ve annenin yenidoğan bakımı hakkında bilgi/eğitim almama durumununun negatif, bebeğin doğum ağırlığı, fototerapi aldığı gün sayısı, doğum sonrası bebeğin ilk emzirilme zamanı ve doğum sonası bilirubin seviyesine ilk bakılma zamanının pozitif etkili olduğu belirlenmiştir. Annelerin en sıklıkla yaptıkları geleneksel uygulama bebeğe sarı giysi giydirme veya sarı bez örtme (%85.1) olduğu belirlenmiştir.

Sonuç: Annelerin emzirmeyi geleneksel uygulama olarak gördükleri belirlenmiştir. Sağlık çalışanları sarılık hakkında annelere eğitim ve danışmanlık vermelidir. Yenidoğanda sarılığı önlemek amacıyla annelerin kültürel uygulamalarından zararlı olanları önlemeye çalışmalıdır.

Anahtar Kelimeler: Geleneksel, Hiperbilirubinemi, İnanç, Yenidoğan.

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Introduction

Jaundice is yellow appearance of skin and sclera as a result of the accumulation of bilirubin in skin and mucous membranes. Jaundice occurs in the first week of life of 20-50% of term babies and 60-80% of preterm babies, when serum total bilirubin (STB) level reaches 5 mg/dl, unlike adults (Hansen & Bratlid, 2012; Wrong et al., 2006). Hyperbilirubinemia occurring in postpartum period is physiological; however, it can cause irreversible brain damage in a minority of newborn babies. According to American Academy of Pediatrics, acute bilirubin encephalopathy is defined as acute manifestations of bilirubin toxicity in the first week after birth, and kernicterus is described as chronic and persistent clinical sequelae of bilirubin toxicity (American Academy of Pediatrics, 2004).

Incidence of kernicterus varies in term and late preterm infants in North America and Europe is 0.4-2.7 per hundred thousand (Maisels & Newman, 2012). Incidence of severe neonatal jaundice in developing countries is approximately 100 times higher than in developed countries (Slusher and Olusaniya, 2012). Frequency of hyperbilirubinemia requiring treatment in newborns in our country is 12% (Tiker at al., 2006). Mothers' use of ineffective or harmful traditional practices in neonatal care in order to prevent hyperbilirubinemia or other health problems in the postpartum period is among reasons for high incidence of neonatal jaundice. These practices not only delay delivery of baby to health institutions, but also cause increase in frequency of hyperbilirubinemia and kernicterus, which reach dangerous limits and require treatment (Özdemir, 2020; Arabacı et al., 2016).

Studies conducted in our country have reported that 78.5% of mothers frequently feed their babies to protect their babies from jaundice, only 8.5% take their baby to a health institution when jaundice occurs (Arısoy et al., 2014). 70.7% wear gold (Çetinkaya et al., 2008) and 48.9% of mothers dressed baby with yellow clothes and put gold on baby after taking jaundiced baby to doctor (Çalışkan & Bayat, 2011). Therefore, it was determined that there are traditional beliefs and practices to reduce neonatal jaundice in our country; however, mothers do not take priority and early action in taking their babies to health institutions.

Although neonatal jaundice can be easily treated with simple and low-risk methods such as phototherapy, mothers' use of traditional medicines and practices prepared at home due to their dominant cultural beliefs before medical care has a significant negative impact on newborn health (Rammohan et al., 2013). This requires a comprehensive analysis of variables that influence health-seeking approach and behaviors of women with newborn jaundice (Rahbari et al., 2013). No study has been found in relevant literature examining dysfunctional beliefs and practices of mothers with newborns diagnosed with hyperbilirubinemia in neonatal intensive care unit to prevent hyperbilirubinemia. In addition, no research has been found that examines traditional practices that mothers know and do until they fetch their baby to health institution, dysfunctional beliefs and practices of mothers, and factors affecting baby's bilirubin level. Therefore, this study aims to determine dysfunctional beliefs and practices of mothers hospitalized for hyperbilirubinemia with diagnosis of hyperbilirubinemia in neonatal intensive care unit (NICU), and factors affecting newborn’s bilirubin level.

Research Questions:

• What are mothers' knowledge levels about hyperbilirubinemia, what are traditional practices they know and do?

• What is mean score of Dysfunctional Beliefs and Practices Scale of mothers regarding baby?

• Is there a significant difference between mean scores of scales based on sociodemographic and obstetric characteristics of mothers?

• Is there a significant relationship between characteristics of mother-baby and scale mean score?

• Are mothers’ and infants’ characteristics predictive of both dysfunctional beliefs and practices and newborn's bilirubin level?

Materials and Methods

Research Design

This is a cross-sectional study. Research was carried out between 8 February 2022 and 31 August 2022 at Neonatal Intensive Care Units of Şanlıurfa Mehmet Akif İnan Training and Research Hospital and Muş State Hospital. Data were collected by researcher XXX by face-to-face interview method in Neonatal Intensive Care Units of Muş State Hospital and Şanlıurfa Mehmet Akif İnan Training and Research Hospital.

Inclusion criteria of researh is volunteer mothers of newborns hospitalized in Neonatal Intensive Care Unit with diagnosis of hyperbilirubinemia. Exclusion criteria are mothers who did not voluntarily participate in the study.

Dependent variables are mean score of the "Dysfunctional Beliefs and Practices Scale" regarding infant care and newborn's bilirubin level. Independent variables are sociodemographic and obstetrical characteristics of mothers, mothers' knowledge levels of hyperbilirubinemia, mothers' traditional beliefs and practices to reduce and prevent hyperbilirubinemia, and newborn characteristics.

Sample

Population of the study consisted of mothers of newborn babies who were hospitalized with diagnosis of hyperbilirubinemia in Muş State Hospital and Şanlıurfa Mehmet Akif İnan Training and Research Hospital Neonatal Intensive Care Unit. Findings of the study conducted by Tiker et al. (2006)' were used to calculate sample size of the study (Tiker et al., 2006). For sample size of the study, prevalence survey sample size calculation based on 5% precision, 95% confidence interval and 12% incidence was used. As a result of calculation, it was determined that a minimum of 163 newborn should be taken into sampling (Prevalence Survey Sample Size: http://sampsize.sourceforge.net/iface/). The number of newborns admitted to both neonatal intensive care units with diagnosis of hyperbilirubinemia at relevant dates was total 193 mothers (69 in Muş State Hospital and 124 in Muş State Hospital). Seven (%3.6) mothers from Muş State Hospitaland 11 (%5.6) mothers from Şanlıurfa Mehmet Akif İnan Training and Research Hospital, total 18 (%9.3) mothers refused to participate in the study. Sample of the study consisted of mothers of 175 (Muş State Hospital: 62, Şanlıurfa Mehmet Akif İnan Training and Research Hospital: 113) newborn diagnosed with hyperbilirubinemia. No sampling method was used in the study. Mothers of all newborns admitted to neonatal intensive care unit with diagnosis of hyperbilirubinemia were reached.

Data Collection Tools

Introductory Information Form and sub-dimension of Dysfunctional Beliefs and Practices Scale regarding infant care were used to collect the data.

Introductory Information Form

This form, developed by researchers, consists of a total of 39 questions, 8 of which question the sociodemographic characteristics of the mothers, 4 questions about the fertility features, 13 questions about the features of newborn, and 14 questions about practices of mothers in neonatal care to reduce or prevent hyperbilirubinemia (Arabacı et al., 2016; Arısoy et al., 2014; Rammohan et al., 2013).

Nonfunctional Belief and Implementation Attitude Scale (NBIAS)

It was developed by Yalçın & Koçak (2012) in order to determine mothers' attitudes towards dysfunctional beliefs and practices, including ineffective and harmful practices related to pregnancy, birth, puerperium and infant care. Scale consists of 58 items and 4 sub-dimensions (non-functional beliefs and practices related to pregnancy, birth, puerperium and infant care). It is a Likert-type scale scored from 1 to 5. A minimum of 58 and a maximum of 290 points are obtained from overall scale. There is an inverse item in the scale. Scores obtained from scale and sub-dimension items are added. Cronbach Alpha value of scale is 0.87. Cronbach Alpha value of NBIAS sub-dimension for infants is 0.86. In this study, only infant-oriented NBIAS sub-dimension was used. NBIAS sub-dimension for infants consists of 18 items. A minimum of 18 and a maximum of 90 points can be obtained from NBIAS sub-dimension for infants. A high total score indicates that mothers have false information and beliefs about dysfunctional practices, while a low total score indicates that mothers' knowledge is healthier and more conscious. NBIAS Cronbach Alpha value for baby was found to be 0.84 in this current study.

Statistical Analysis

SPSS 26.0 package program was used in data analysis. Number, percentage, mean, standard deviation, median, minimum and maximum values were calculated from descriptive statistics. Kolmogorov Smirnov test was used to determine conformity of continuous variables to normal distribution. Difference between means of scale scores according to categorical variables was determined by Independent Sample t Test or Man Whitney U test for two independent groups, and by One Way ANOVA or Kruskal Wallis test for more than two groups. Significant relationship between numerical variables and scale mean scores was obtained

through Spearman correlation analysis. In addition, multivariate linear regression analysis was performed using enter method in order to predict dysfunctional beliefs and practices and bilirubin level of newborn using maternal and neonatal variables.

All independent variables were added to multiple linear regression model by dummy coding. Independent variables added to regression and their codes are: "Gender of baby 0= female, 1= male; baby has got phototherapy 0= no 1= yes; baby's first breastfeeding time after birth 0= within 0-15 minutes, 1= within 16 minutes or more; frequency of breastfeeding 0= every 1-2 hours, 1= every 3-4 hours; mother's marital status 0= single, 1= married; family type 0= nuclear family, 1= extended family; where he spent the longest time 0= city center, 1= district/village; education level 0= secondary school and above, 1= primary school and below; social security status 0= yes, 1= no; operating status 0= yes, 1= no; economic situation 0= my income is equal to my expenses or my income is more than my expenses, 1= my income is less than my expenses; place of birth 0= in hospital 1= at home; information/education on infant care 0= yes 1= no; the status of receiving information/education about hyperbilirubinemia was included in model as 0=yes 1=no. Statistical significance of study was accepted as $p<0.05$, with a confidence interval of 95%.

Ethical Considerations

Ethics committee permission was obtained from Muş Alparslan University Scientific Research and Publication Ethics Committee (Date: 07/02/2022 No: 2/16), and institutional permissions were obtained from Muş and Şanlıurfa Provincial Health Directorates. Written and verbal consent was obtained from participating mothers.

Results

Mean age of mothers participating in the study was 27.5±6.2. 32% of participants are between ages of 20-25, 99.4% are married, 60.6% have a nuclear family, 29.1% are primary school graduates and 49.1% live in city center. 10.9% of mothers started to breastfeed newborn within the first 15 minutes after birth. It was discovered that 56.0% of women lacked knowledge about newborn care, and 64.0% lacked knowledge regarding hyperbilirubinemia (Table 1).

It was found that 97.1% of newborns with a diagnosis of hyperbilirubinemia were born in hospital and average bilirubin level was 14.2±3.3 during their admission to intensive care unit. 51.4% of them were girls, mean birth weight was 3003.9±514.8, week of birth was 38.0±2.2, and 5. min APGAR score was 8.2±0.6. Rate of receiving phototherapy in these newborn sick children was 93.7%, and they received phototherapy for an average of 1.7±0.7 days. They started to be breastfed at an average of 42.4±19.3 minutes postpartum. In addition, 10.9% (19) of newborns started breastfeeding within ≤15 minutes after delivery. It was determined that 99.4% of newborns were breastfed every 1-2 hours, breastfed an average of 15.2±4.8 times a day, and bilirubin levels were measured in the first 27.4±11.7 hours postpartum (Table 1).

Mothers' mean NBIAS score for newborns was found to be 49.6±13.5. Mean NBIAS score of mothers who have an extended family, gave birth at home, whose newborn birth weight is ≤2500 grams, whose newborn's birth week is <37 week, whose newborn did not receive phototherapy, and whose newborn's bilirubin level at postpartum was not measured in the first 24 hours after birth was higher. NBIAS score average of mothers with undergraduate and higher education level was found to be lower than mothers with other education levels (Table 1).

Table 1. Comparison of Nonfunctional Belief and Implementation Attitude Scale toward neonatal mean scores according to mothers' and babies' features

Mother and baby's features	Total Mother (n=175)	NBIAS Toward Neonatal	
	Mean (±SD) / %(n)	Mean (±SD)	Test/p
NBIAS Toward Neonatal, mean (±SD)	49.6 (±13.5)		
Age, mean (±SD)	27.5 (±6.2)		
Age, %(n)			
19 years and under	8.6 (15)	51.8 (12.4)	F: 2.2
20-25 years old	32.0 (56)	47.6 (12.9)	p:0.07
26-30 years old	29.7 (52)	49.6 (14.3)	
31-35 years old	17.1 (30)	47.1 (12.9)	
36 years and older	12.6 (22)	56.6 (13.0)	

Marital status, %(n)			
Married	99.4 (174)	49.7 (13.5)	t: 1.2
Single	0.6 (1)	33.0 (0)	p:0.2
Family type, %(n)			
Nuclear	60.6 (106)	47.5 (13.0)	t: -2.6
Extended	39.4 (69)	52.9 (13.6)	**p<0.01**
Lived place, %(n)			
City center	49.1 (86)	49.0 (13.4)	F: 0.46
District	23.4 (41)	49.0 (13.5)	p:0.6
Village	27.4 (48)	51.2 (13.8)	
Education status, %(n)			
İlliterate	9.1 (16)	50.3 (13.4)	F: 3.0
Literate	3.4 (6)	54.1 (18.9)	**p:0.01**
Primary school	29.1 (51)	51.6 (13.6)	
Middle school	24.6 (43)	49.6 (12.3)	
High school	25.7 (45)	50.5 (12.7)	
Bachelor's degree and above	8.0 (14)	37.0 (11.9)	
Social security status, %(n)			
Yes	62.9 (110)	49.0 (13.2)	t: -0.8
No	37.1 (65)	50.8 (14.0)	p:0.3
Working status, %(n)			
Yes	12.0 (21)	51.5 (15.8)	t: 0.6
No	88 (154)	49.4 (13.2)	p:0.04
Income status, %(n)			
Income < Expense	41.1 (72)	50.4 (12.9)	F: 0.3
Income = Expense	55.4 (97)	49.2 (13.8)	p:0.6
Income > Expense	3.4 (6)	46.1 (16.8)	
First marriage age, mean (±SD)	21.5 (3.8)		
First marriage age, % (n)			
14-19 years old	33.1 (58)	51.9 (12.8)	H: 4.6
20-24 years old	42.9 (75)	47.1 (12.1)	p:0.09
25 years and older	24.0 (42)	51.0 (16.1)	
Number of living children, mean (±SD)	2.5 (1.7)		
Number of living children, % (n)			
2 and below	58.3 (102)	48.5 (13.9)	t: -1.3
3 and above	41.7 (73)	51.2 (12.7)	p:0.18
Baby's birthplace, % (n)			
Hospital	97.1 (170)	49.2 (13.3)	t: -2.7
Home	2.9 (5)	65.6 (8.4)	**p<0.01**
Baby's bilirubin level, mean (±SD)	14.2 (3.3)		
Baby's gender, % (n)			
Girl	51.4 (90)	50.3 (13.4)	U: 3460.5
Boy	48.6 (85)	48.9 (13.6)	p:0.2
Baby's birth weight, mean (±SD)	3003.9 (514.8)		
Baby's birth weight, %(n)			
<2500	14.3 (25)	57.2 (13.0)	F: 4.8
2500-3500	71.4 (125)	48.2 (13.3)	**p<0.01**
>3501	14.3 (25)	48.9 (12.9)	
Baby's birth week, mean (±SD)	37.8 (2.2)		
Baby's birth week, %(n)			
<37	23.4 (41)	55.2 (12.9)	t: 3.0
37 and above	76.6 (134)	47.9 (13.2)	**p<0.01**
Baby's 5.min APGAR score, mean (±SD)	8.2 (0.6)		
Baby's phototherapy treatment status, % (n)			
Yes	93.7 (164)	48.5 (12.9)	t: -4.2
No	6.3 (11)	65.6 (11.6)	**p<0.01**
Number of day baby received phototherapy, mean (±SD)	1.7 (0.7)		
Baby's first breastfeeding time after birth (minutes), mean (±SD)	42.4 (19.3)		
Baby's first breastfeeding time after birth (minutes), % (n)			
Within ≤15 minutes	10.9 (19)	57.1 (15.2)	F: 1.3
In 16-30 minutes	44.0 (77)	49.5 (14.2)	p:0.08
Within >31 minutes	45.1 (79)	47.9 (11.8)	
Baby's breastfeeding frequency, % (n)			
Breastfeeding every 1-2 hours	99.4 (174)	49.6 (13.5)	t: 0.2

Breastfeeding every 3-4 hours	0.6 (1)	46.0 (0)	p:0.7
Baby's daily breastfeeding frequency after birth, mean (±SD)	15.2 (4.8)		
Postnatal first check time of baby's bilirubin level (hour), mean (±SD)	27.4 (11.7)		
Postnatal first check time of baby's bilirubin level (hour), % (n)			
≤ first 24 hours	69.1 (121)	48.1 (11.7)	U: 2629.5
> first 24 hours	30.9 (54)	53.0 (16.5)	**p:0.03**
Mother's status of getting information about baby care, % (n)			
Yes	44.0 (77)	49.6 (11.5)	t:-0.006
No	56.0 (98)	49.6 (14.9)	p:0.9
Mother's status of getting information about hyperbilirubinemia, % (n)			
Yes	36.0 (63)	51.1 (11.4)	t:1.15
No	64.0 (112)	48.8 (14.5)	p:0.2

NBIAS: Nonfunctional Belief and Implementation Attitude Scale; SD: Standard Deviation; p: Statistical Significance
t: Independent Sample t Test; U: Man Whitney U Test; F: One Way ANOVA; H: Kruskal Wallis Test

It was determined that 85.1% of mothers most frequently used expressions "yellow cloth is tied as a swaddle or baby is covered with a yellow cloth". In addition, mothers who know/hear traditional practices have a higher NBIAS score average than those who do not ($p<0.05$). Most common traditional practices of mothers were tying a yellow cloth as swaddling or covering the baby with a yellow cloth (85.1%) (Table 2).

Table 2. Traditional practices that mothers know and do for hyperbilirubinemia

Traditional belief and practices mothers known for newborns	**Total Women (n=175)**	**NBIAS Toward Neonatal**			**Traditional practices mothers made for newborns (n=175)**
	%(n)	**Mean (±SD)**	**Test**	**p**	**% (n)**
Yellow cloth is tied and covered as swaddle, % (n)					
Yes	85.1 (149)	51.6 (12.7)	U: 814.5	**p<0.01**	85.1 (149)
No	14.9 (26)	38.5 (12.8)			14.9 (26)
Gold jewelry is attached to baby, % (n)					
Yes	68.6 (120)	51.3 (12.6)	U: 2586.0	**p:0.02**	68.6 (120)
No	31.4 (55)	46.1 (14.7)			31.4 (55)
Yellow clothes is dressed to baby, % (n)					
Yes	66.9 (117)	53.1 (12.6)	t: 5.1	**p<0.01**	66.9 (117)
No	33.1 (58)	42.6 (12.6)			33.1 (58)
Sugar water is given to baby after birth, % (n)					
Yes	36.0 (63)	53.9 (11.5)	t: 3.1	**p<0.01**	36.0 (63)
No	64.0 (112)	47.2 (14.0)			64.0 (112)
Baby is given zamzam water, % (n)					
Yes	45.7 (80)	53.5 (12.6)	t: 3.6	**p<0.01**	45.7 (80)
No	54.3 (95)	46.3 (13.4)			54.3 (95)
A religious teacher or sheikh prays to baby, % (n)					
Yes	56.6 (99)	53.7 (13.1)	U: 2214.0	**p<0.01**	56.6 (99)
No	43.4 (76)	44.3 (12.2)			43.4 (76)
Baby is given zamzam water, % (n)					
Yes	45.7 (80)	53.5 (12.6)	t: 3.6	**p<0.01**	45.7 (80)
No	54.3 (95)	46.3 (13.4)			54.3 (95)
Baby is given zamzam water, % (n)					
Yes	45.7 (80)	53.5 (12.6)	t: 3.6	**p<0.01**	45.7 (80)
No	54.3 (95)	46.3 (13.4)			54.3 (95)
Eggs are inedible, % (n)					
Yes	2.9 (5)	59.8 (10.8)	t: 1.7	p:0.08	2.9 (5)
No	97.1 (170)	49.3 (13.5)			97.1 (170)

Baby is taken to the hearth. A razor is thrown between his eyebrows. This process is repeated on three Fridays, % (n)				
Yes	13.1 (23)	63.6 (9.9)	U: 550.5	**p<0.01**
No	86.9 (152)	47.5 (12.7)		
Baby is taken to hearth. A woman with a hearth ties a red thread to the child's hand and a yellow thread to the rosewood. Ropes stay for three or four days. Then the child gets better, % (n)				
Yes	4.6 (8)	61.8 (9.9)	t: 2.6	**p<0.01**
No	95.4 (167)	49.0 (13.4)		
Baby is bathed in Papaveraceous juice, % (n)				
Yes	8.6 (15)	64.6 (8.1)	t: 4.7	**p<0.01**
No	91.4 (60)	48.2 (13.0)		
Behind the ear or sublingual of baby is cut, % (n)				
Yes	18.9 (33)	62.2 (11.3)	t: 6.5	**p<0.01**
No	81.1 (142)	46.7 (12.3)		
Baby is dipped in healing water, % (n)				
Yes	29.1 (51)	55.1 (12.6)	U: 2006.5	**p<0.01**
No	70.9 (124)	47.4 (13.2)		
Small cuts are made to baby's back, % (n)				
Yes	15.4 (27)	63.7 (8.6)	t: 6.5	**p<0.01**
No	84.6 (148)	47.0 (12.6)		

Hearth: A family or person who is believed to have cured a particular complaint or illness by using information passed down from one generation to the next in traditional health practices
NBIAS: Nonfunctional Belief and Implementation Attitude Scale;
SD: Standard Deviation; p: Statistical Significance;
t: Independent Sample t Test; U: Man Whitney U Test

There was a negative correlation between mothers' NBIAS score average and newborn's birth weight (r:-0.23) and week of birth (r:0.24), and a positive correlation between the mothers' NBIAS score average and the newborn's daily postpartum breastfeeding frequency (r:0.29). A positive correlation was found between bilirubin level of newborn and birth weight (r:0.36), week of birth (r:0.24), the number of days of phototherapy the baby received (r:0.43), and time of starting the first breastfeeding after birth (r:-0.20). A negative significant relationship was determined between bilirubin level of newborn and frequency of daily breastfeeding after birth (r:-0.20, p<0.01) (Table 3).

Table 3. The relationship between mother's and baby's sociodemographic-obstetric characteristics and Nonfunctional Belief and Implementation Attitude Scale toward neonatal mean scores

	Features	**Features**											
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1.	NBIAS Toward Neonatal	1											
2.	Baby's bilirubin level	r:0.01 p:0.8	**1**										
3.	Baby's birth weight	r:-0.23 **p<0.01**	r:0.36 **p<0.01**	1									
4.	Baby's birth week	r:-0.24 **p<0.01**	r:0.24 **p<0.01**	r:0.64 **p<0.01**	1								
5.	Baby's 5.min APGAR score	r:-0.07 p:0.3	r:-0.1 p:0.1	r:0.1 p:0.07	r:0.21 **p<0.01**	1							
6.	Number of day baby received phototherapy	r:0.1 p:0.1	r:0.43 **p<0.01**	r:0.07 p:0.3	r:-0.004 p:0.9	r:-0.12 p:0.1	1						
7.	Baby's first breastfeeding time after birth (minutes)	r:-0.1 p:0.07	r:0.22 **p<0.01**	r:0.1 p:0.1	r:0.05 p:0.4	r:-0.10 p:0.16	r:0.08 p:0.2	1					

8.	Baby's daily breastfeeding frequency after birth	r:0.29 **p<0.01**	r:-0.20 **p<0.01**	r:-0.19 **p:0.01**	r:-0.22 **p:0.01**	r:0.02 p:0.7	r:0.06 p:0.3	r:-0.37 **p<0.01**	1				
9.	Postnatal first check time of baby's bilirubin level (hour)	r:0.1 p:0.06	r:0.1 p:0.05	r:0.01 p:0.8	r:0.02 p:0.7	r:0.21 **p<0.01**	r:0.14 p:0.06	r:-0.14 p:0.05	r:0.18 **p:0.01**	1			
10.	Mother age	r:0.09 p:0.2	r:0.05 p:0.4	r:-0.1 p:0.1	r:-0.04 p:0.5	r:0.05 p:0.4	r:0.1 p:0.18	r:-0.12 p:0.09	r:0.22 **p<0.01**	r:0.07 p:0.3	1		
11.	First gestational age	r:-0.07 p:0.3	r:0.01 p:0.8	r:-0.10 p:0.1	r:-0.10 p:0.1	r:0.01 p:0.8	r:0.1 p:0.1	r:-0.09 p:0.2	r:0.22 **p<0.01**	r:0.12 p:0.09	r:0.26 **p<0.01**	1	
12.	Number of living children	r:0.1 p:0.07	r:0.06 p:0.3	r:-0.03 p:0.6	r:0.05 p:0.4	r:0.04 p:0.5	r:0.08 p:0.2	r:-0.06 p:0.3	r:0.01 p:0.8	r:-0.09 p:0.2	r:0.69 **p<0.01**	r:-0.29 **p<0.01**	1

NBIAS: Nonfunctional Belief and Implementation Attitude Scale;
r: Spearman's rho Coefficient

Multivariate linear regression analysis was performed using maternal and neonatal variables to predict mean NBIAS scores of mothers. As a result of analysis, a significant regression model F(25, 149) = 3.128, p<0.01 was formed, and it was determined that 23.4% of variance in dependent variable (R2adjusted = 0.394) was explained by independent variables. Accordingly, it was determined that newborn's phototherapy status (yes) predicted mean NBIAS score of mothers negatively, while the number of daily breastfeeding of newborn and place where mother gave birth (at home) predicted positively and significantly (Table 4).

In order to predict bilirubin level of newborn, multivariate linear regression analysis was performed using maternal and neonatal variables and mean NBIAS score of mothers. As a result of analysis, a significant regression model F(25, 149) = 5.533, p<0.01 was formed, and it was determined that 39.4% of variance in dependent variable (R2adjusted = 0.394) was explained by independent variables. Accordingly, it was determined that newborn's bilirubin level was negatively predicted by baby's 5th minute APGAR score and mother's status of receiving information/education about newborn care (no), and positively and significantly predicted by birth weight, number of days on phototherapy, first breastfeeding time after birth, and first postpartum measurement of bilirubin level (Table 5).

Table 4. Multiple Linear Regression Analysis Between NBIAS and Some Sociodemographic Variables of Women and Babies

Model	Unstandardized Coefficients	Standardized Coefficients	t	p	95% Confidence Interval for B		Correlations
	B	Beta			Lower Bound	Upper Bound	Partial
Constant	78.57		2.77	**<0.01**	22.67	134.74	
Baby's bilirubin level	0.50	0.12	1.35	0.1	-0.23	1.24	0.11
Baby's gender (1: boy)	-3.63	-0.13	-1.84	0.06	-7.52	0.26	-0.14
Baby's birth weight	-0.004	-0.15	-1.37	0.1	-0.01	0.002	-0.11
Baby's birth week	-0.38	-0.06	-0.59	0.5	-1.65	0.88	-0.04
Baby's 5.min APGAR score	-1.45	-0.07	-0.95	0.3	-4.46	1.54	-0.07
Baby's phototherapy treatment status (1: yes)	-13.78	-0.24	-2.47	**0.01**	-24.79	-2.76	-0.19
Number of day baby received phototherapy	1.69	0.10	1.20	0.2	-1.08	4.47	0.09
Baby's first breastfeeding time after birth (minutes)	-0.05	-0.08	-0.94	0.3	-0.17	0.06	-0.07
Baby's first breastfeeding time after birth (minutes), (1: 16 minutes and above)	-0.75	-0.01	-0.20	0.8	-8.13	6.62	-0.01
Baby's breastfeeding frequency (1: breastfeeding every 3-4 hours)	5.11	0.02	0.41	0.6	-19.52	29.74	0.03
Baby's daily breastfeeding frequency after birth	0.63	0.22	2.54	**0.01**	0.14	1.12	0.20
Postnatal first check time of baby's bilirubin level (hour)	0.15	0.13	1.58	0.1	-0.0	0.33	0.12
Mother age	-0.24	-0.11	-0.69	0.4	-0.927	0.44	-0.05
Mother marital status (1: married)	13.24	0.07	1.05	0.2	-11.53	38.01	0.08
Family type (1: extended)	4.34	0.15	1.95	0.05	-0.03	8.72	0.15
Lived place (1: district/village)	-0.09	-0.003	-0.04	0.9	-2.18	2.09	-0.003
Mother education status (1: primary school and below)	3.17	0.11	1.34	0.1	-1.48	7.82	0.11

Social security status (1: no)	0.52	0.01	0.22	0.8	-4.01	5.06	0.01
Mother's working status (1: no)	2.58	0.06	0.82	0.4	-3.58	8.74	0.06
Income status (1: income < expense)	-0.78	-0.02	-0.39	0.6	-4.72	3.16	-0.03
Mother's first marriage age	-0.35	-0.09	-0.91	0.3	-1.11	0.40	-0.07
Baby's birthplace (1: home)	13.13	0.16	2.16	**0.03**	1.12	25.15	0.17
Number of living children	0.26	0.03	0.19	0.8	-2.34	2.85	0.01
Mother's status of getting information about baby care (1: no)	-1.80	-0.06	-0.79	0.4	-6.31	2.7	-0.06
Mother's status of getting information about hyperbilirubinemia (1: no)	-0.57	-0.02	-0.26	0.7	-4.94	3.797	-0.02

Multiple Linear Regression Model (R:0.587, Adjusted R^2:0.234, F(25, 149) = 3.128, p<0.01)
NBIAS: Nonfunctional Belief and Implementation Attitude Scale
APGAR: Activity - Pulse - Grimace - Appearance – Respiration

Table 5. Multiple Linear Regression Analysis Between Baby's Bilirubin Level and Mother's NBIAS mean scores and Mother's and Baby's Sociodemographic Variables

Model	Unstandardized Coefficients	Standardized Coefficients	t	p	95% Confidence Interval for B		Correlations
	B	Beta			Lower Bound	Upper Bound	Partial
Constant	1.67		0.26	0.7	-10.77	14.12	
Baby's gender (1: boy)	0.82	0.12	1.92	0.05	-0.02	1.66	0.15
Baby's birth weight	0.002	0.36	3.79	**<0.01**	0.001	0.004	0.29
Baby's birth week	0.11	0.08	0.85	0.3	-0.15	0.39	0.07
Baby's 5.min APGAR score	-0.84	-0.17	-2.61	**0.01**	-1.48	-0.20	-0.21
Baby's phototherapy treatment status (1: yes)	0.46	0.03	0.37	0.7	-1.97	2.90	0.03
Number of day baby received phototherapy	1.16	0.29	3.98	**<0.01**	**0.58**	1.73	0.31
Baby's first breastfeeding time after birth (minutes)	0.03	0.21	2.80	**<0.01**	0.01	0.06	0.22
Baby's first breastfeeding time after birth (minutes), (1: 16 minutes and above)	-1.42	-0.13	-1.77	0.07	-3.007	0.16	-0.14
Baby's breastfeeding frequency (1: breastfeeding every 3-4 hours)	2.02	0.04	0.74	0.4	-3.31	7.36	0.06
Baby's daily breastfeeding frequency after birth	-0.04	-0.06	-0.74	0.4	-0.15	0.06	-0.06
Postnatal first check time of baby's bilirubin level (hour)	0.06	0.24	3.39	**<0.01**	0.02	0.10	0.26
Mother age	-0.04	-0.08	-0.57	0.5	-0.19	0.10	-0.04
Mother marital status (1: married)	0.68	0.01	0.24	0.8	-4.71	6.07	0.02
Family type (1: extended)	-0.23	-0.03	-0.48	0.6	-1.19	0.72	-0.04
Lived place (1: district/village)	-0.22	-0.03	-0.48	0.6	-1.15	0.70	-0.04
Mother education status (1: primary school and below)	0.27	0.04	0.53	0.5	-0.74	1.29	0.04
Social security status (1: no)	-0.62	-0.09	-1.25	0.2	-1.60	0.35	-0.10
Mother's working status (1: no)	0.42	0.04	0.62	0.5	-0.91	1.76	0.05
Income status (1: income < expense)	-0.01	-0.003	-0.04	0.9	-0.87	0.84	-0.00
Mother's first marriage age	0.11	0.12	1.33	0.1	-0.05	0.27	0.10
Baby's birthplace (1: home)	-0.57	-0.02	-0.42	0.6	-3.22	2.07	-0.03
Number of living children	0.52	0.27	1.87	0.06	-0.02	1.08	0.15
Mother's status of getting information about baby care (1: no)	-1.06	-0.16	-2.17	**0.03**	-2.03	-0.09	-0.17
Mother's status of getting information about hyperbilirubinemia (1: no)	-0.16	-0.02	-0.33	0.7	-1.11	0.78	-0.02
NBIAS mean score	0.02	0.09	1.35	0.1	-0.01	0.05	0.11

Multiple Linear Regression Model (R:0.694, Adjusted R^2:0.394, F(25, 149) = 5.533, p<0.01)
NBIAS: Nonfunctional Belief and Implementation Attitude Scale
APGAR: Activity - Pulse - Grimace - Appearance – Respiration

DISCUSSION

This study aimed to discover dysfunctional beliefs and practices of mothers whose newborn baby was hospitalized in neonatal intensive care unit with diagnosis of hyperbilirubinemia. It also intended to determine factors affecting bilirubin level of newborn. This study determined mean NBIAS score for

newborns of mothers who were admitted to NICU with diagnosis of hyperbilirubinemia as 49.6 (min=18 max=90 can be taken from the scale). This shows that mothers' dysfunctional beliefs and practices to prevent or reduce jaundice are at a moderate level. There is no study in literature evaluating dysfunctional beliefs and practices in newborn mothers with hyperbilirubinemia, which refers to originality of research.

A positive correlation was found between mothers' daily postpartum breastfeeding frequency and traditional beliefs and practices. It was determined that number of daily breastfeeding of baby increased dysfunctional beliefs and practices of mothers. This can be thought of as mothers seeing breastfeeding as a traditional practice. No study has been found in literature with similar results to these findings. Therefore, it is thought that these findings make an important contribution to literature.

Sociodemographic characteristics of mothers significantly affect their level of knowledge about neonatal care and hyperbilirubinemia. It was determined that 44.0% of mothers had knowledge about newborn care, 36% had knowledge about hyperbilirubinemia, and 10.9% of them breastfed their babies within the first 15 minutes after birth. In addition, dysfunctional beliefs and practices of mothers who had a large family structure, had a literate education level, gave birth at home, had a baby below 2500 g and gave delivery before 37 weeks were found to be higher. The study revealed that giving birth at home increased mothers' dysfunctional beliefs and practices. In a study conducted in Egypt, it was reported that mothers mostly with low education level, not working and living in rural areas had moderate knowledge about neonatal jaundice, risk factors and complications (Ansong-Assoku et al., 2022). A study conducted in Iran found that 25% of mothers did not have knowledge that appearance of neonatal jaundice in the first 36 hours is abnormal, and 47% did not have knowledge that neonatal jaundice can lead to hyperbilirubinemia (Mohammed Kassim et al., 2021). A study conducted in Nepal revealed that mothers do not have enough information about neonatal jaundice, and most of them noticed jaundice thanks to healthcare professionals or individuals around them (Dharel & Bhattarai, 2016). A study conducted in Turkey reported that 53.6% of mothers did not have sufficient knowledge about neonatal jaundice, and mothers with a high level of education and a previous baby with jaundice had a higher level of knowledge (Sutcuoglu et al., 2012). Findings of current study are similar to literature. Study shows that mothers' level of knowledge about jaundice is low and they do not receive training on this subject, and their sociodemographic characteristics, infant care and knowledge levels about hyperbilirubinemia significantly affect their dysfunctional beliefs and practices.

During hospitalization of a newborn with hyperbilirubinemia to intensive care unit, clinical features of newborn, time of first breastfeeding of newborn, and serum bilirubin level play a decisive role in determining severity of jaundice and preventing complications. This study revealed that mean bilirubin levels of newborns with a diagnosis of hyperbilirubinemia during their admission to Neonatal Intensive Care Unit were 14.2%, 14.3% of the newborns were below 2500 grams, 23.4% were born before 37 weeks of gestation, 2.9% were born at home, fifth minute Apgar mean score of 8.2, 93.7% received phototherapy for an average of 1.7 days, they were breastfed an average of 15.2 times after birth, 89.1% were not breastfed within first 15 minutes after birth, they were started to breastfeed at an average of 42 minutes, and bilirubin level of 30.9% was measured after first 24 hours. Also it was determined that mean NBIAS score of mothers increased as birth weight and week of birth of newborn decreased. Similar results were obtained in studies on newborns with hyperbilirubinemia. This shows that as clinical condition of newborn progresses negatively, mothers' resorting to traditional practices before seeking medical care increases. In a study on newborns with similar characteristics in Vietnam, it was reported that 21% of newborns develop jaundice in first seven days postpartum (Le et al., 2014). In another study, it was reported that serum bilirubin level of newborns was 21.6 after hospitalization in intensive care unit, and a two-fold decrease (10.1) in bilirubin level within an average of 2 days after treatment (Amirshaghaghi et al., 2008). Another study reported that in 50% (n:3/6) of newborns with G6PD deficiency, mothers put camphor (naphthalene) between their newborn's clothes before the onset of severe hyperbilirubinemia, and camphor triggers hemolysis in newborns with G6PD deficiency (Osuorah et al., 2018). Findings of this study show that average serum bilirubin level of newborn obtained is lower than values obtained in literature. It is thought that this difference is due to the fact that almost all newborn babies were born in hospital, serum bilirubin levels were checked before first 24 hours, and admission to intensive care unit was early.

Studies have revealed that mothers resort to traditional beliefs and practices to prevent or reduce jaundice when yellow color becomes evident in skin and sclera due to increase in baby's bilirubin level after birth, or when baby inadequately responses to sucking or stimuli. This cause a delay in time to check baby's bilirubin level and cause significant complications. A study conducted in Nigeria found that 34.1%

of mothers postponed their newborn care for 48 hours and 28.6% showed appropriate health care seeking behavior. In addition, the behaviors of delaying health care seeking behavior, using home-prepared drugs for treatment, and receiving treatment after 48 hours were observed in mothers with low education and low socioeconomic status. It was determined that this causes a high total serum bilirubin level in newborn (Ogunlesi & Ogunlesi, 2012). Another study reported that approximately one-third of mothers consulted a doctor within 24 hours after appearance of jaundice, and 13.8% waited until medical advice and resorted to traditional methods at home (Amirshaghaghi et al., 2008). The fact that mothers receive medical care for hyperbilirubinemia shows that they believe that severity and complications of hyperbilirubinemia in newborn can not be eliminated with traditional practices before medical care and that phototherapy is more effective than traditional practices in reducing hyperbilirubinemia.

In this study, it was determined that the most common traditional practices are tying a yellow cloth as swaddling or covering the baby with a yellow cloth. A study reported that 36.5% of the mothers breastfed their baby diagnosed with jaundice, 34.9% exposed their baby to sunlight protects the newborn from jaundice (Olatunde et al., 2020). A study conducted in Iran found that 6% of mothers gave their newborns traditional herbal remedies prepared at home, 9% used herbal remedies for neonatal jaundice, 61% carried yellow beads on their baby (Mohammed Kassim et al., 2021). In Nigeria, it was reported that mothers put camphor, which is used as a disinfectant and insecticide, between the baby's clothes and this poses a risk for neonatal jaundice (Osuorah et al., 2018). Again another study in Nigeria reported that 36% of mothers used claw extract plants (Esan et al., 2022). The findings of this current study show similarities with previous research findings. However, it was observed that mothers have more harmless and ineffective traditional beliefs and practices and continue to breastfeed their babies frequently to prevent jaundice. In addition, although data obtained in this study are similar to other studies conducted in Turkey, they were found to be different from applications made in other countries. This shows that different sociodemographic characteristics of society and cultural beliefs and practices affect traditional beliefs and practices of mothers to prevent neonatal jaundice.

Limitations and Strengths of the Study

This study was carried out in only two centers and was included in the study. The results can not be generalized to the population because the mothers and newborns in the study had similar sociodemographic characteristics. But this research provides important findings for determining traditional practices and preventing wrong practices by reaching the mothers of babies with hyperbilirubinemia.

CONCLUSION

It was concluded that the mothers did not receive adequate training on neonatal care and hyperbilirubinemia, and traditional beliefs and practices regarding neonatal care and hyperbilirubinemia were moderate. It was also concluded that sociodemographic characteristics of mothers affected their traditional beliefs and practices, and current clinical status of tnewborn diagnosed with hyperbilirubinemia affected health-seeking behavior of mothers and application to traditional practices.

The fact that mothers do not have sufficient knowledge about neonatal jaundice and their trust in dysfunctional beliefs and practices may delay their behavior in seeking medical care and cause undesirable results that may threaten the health of the newborn. To prevent this, health professionals should evaluate the traditional beliefs and practices of mothers towards newborns in health centers or during home visits and pregnancy and postpartum follow-up. Necessary training, counseling and follow-up should be done to prevent traditional beliefs and practices that may threaten maternal and newborn health.

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Declaration of Interests

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Author Contributions

Concept, Design, Supervision, Resources, Materials, Data Collection and or Processing, Analysis, Interpretation, Litreture Search, Writing Manuscript, Critical Review, Discussion - AK; Concept, Design, Supervision, Resources, Materials, Analysis, Interpretation, Litreture Search, Writing Manuscript, Critical Review, Discussion, Resources, Litreture Search, Critical Review, Discussion - ŞA.

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