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Mothers' Knowledge of Neonatal Danger Signs: A Descriptive Study

Annelerin Yenidoğan Tehlike İşaretleri Hakkında Bilgisi: Tanımlayıcı Bir Çalışma

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ABSTRACT

Aim: This study was performed to investigate mothers' knowledge of neonatal danger signs.

Material and Method: The present research is a descriptive study. The study was carried out in a children's hospital in the southeast of Turkey. The study sample consisted of 214 mothers who had infants aged between 0-12 months, did not have communication barriers, and agreed to participate in the study. Data were collected by the face-to-face interview method using the Demographic Information Questionnaire and the Neonatal Danger Signs Information Form.

Results: The mean danger signs knowledge score of the mothers was found to be 9.78±3.41. The knowledge of 88.3% of the mothers was at a "good" level. The mothers reported cough and diarrhea as danger signs at the highest rate of 81.8%, fever at a rate of 80.4%, and vomiting and malnutrition at a rate of 79%. The factors affecting the mothers' knowledge of danger signs (high/low) were examined by binary logistic regression analysis, and it was found that income status affected their knowledge ($p<0.05$). Although the mothers' knowledge and experience of danger signs were high, they presented to health institutions at a low level.

Conclusion: This study found mothers' knowledge of neonatal danger signs to be quite high. It was recommended that mothers should be informed about the things that must be done regarding neonatal danger signs.

Keywords: Newborn, danger sign, mother, nursing

ÖZ

Amaç: Bu çalışma annelerin yenidoğan tehlike işaretleri hakkındaki bilgilerinin incelenmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı tipte bir çalışmadır. Çalışma Türkiye'nin güneydoğusunda bir çocuk hastanesinde yapılmıştır. Çalışmanın örneklemini 0-12 ay arasında bebeği olan, iletişim engeli olmayan, çalışmaya katılmayı kabul eden 214 anne oluşturmuştur. Veriler Demografik Bilgiler Soru Formu ve Yenidoğan Tehlike İşaretleri Bilgi Formu kullanılarak yüzyüze görüşme yöntemiyle elde edilmiştir.

Bulgular: Annelerin tehlike işaretleri bilgi puan ortalaması 9.78±3.41 olarak bulunmuştur. Annelerin %88.3'ünün "iyi" bilgi düzeyindedir. Anneler en yüksek oranda %81.8'i öksürük ve ishali, %80.4'ü yüksek ateşi, %79'u kusma ve beslenememe durumunu tehlike işareti olarak bildirmiştir. Annelerin tehlike işaretleri bilgi durumunu (yüksek/düşük) etkileyen faktörler binary lojistik regresyon analizi ile incelenmiş, gelir durumunun etkilediği belirlenmiştir ($p<0.05$). Annelerin tehlike işaretlerini bilme ve deneyimleme oranı yüksek olmasına rağmen sağlık kurumuna başvuru düşük olarak tespit edilmiştir.

Sonuç: Bu çalışmada annelerin yenidoğan tehlike işaretlerine ilişkin bilgi düzeyleri oldukça yüksek bulunmuştur. Annelerin yenidoğan tehlike işaretleri konusunda yapılması gerekenlere yönelik bilgilendirilmesi önerilmiştir.

Anahtar Kelimeler: Yenidoğan, tehlike işareti, anne, hemşirelik

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INTRODUCTION

Newborns are at high risk of developing disease since their immune system is immature and they experience physiological changes leading to severe life-threatening diseases. Therefore, constant monitoring and family care are required (1). The first 28 days of life, in other words, the neonatal period, is the most vulnerable period for a child's survival. UNICEF stated that children face the highest risk of dying in their first month of life. According to the United Nations International Children's Emergency Fund (UNICEF), 2.3 million newborns died in the first month of life in 2021 globally, with approximately 6400 neonatal deaths occurring each day (2). Most neonatal deaths in developing countries occur at home, and two-thirds of them can be prevented if timely and effective health measures are taken (3). Most of these deaths occur due to the late diagnosis of neonatal diseases, delays in the decision to seek care at the family level, and late intervention in health institutions (4-6). Especially delays at the family level are important because if parents fail to notice danger signs in the newborn, this can lead to delays in seeking health care, delayed initiation of appropriate treatment, and delays in referral to a better-resourced hospital. It is very important for mothers or caregivers to be aware of danger signs in the newborn to reduce these delays and preventable deaths (6, 7).

The early diagnosis of neonatal diseases is an important step toward improving neonatal survival. Therefore, mothers must be able to identify symptoms that exacerbate neonatal diseases postpartum. Neonatal danger signs are danger signs recognized by the World Health Organization (WHO) in case of severe illness or local infection (4). Neonatal danger signs for severe illness have been reported as the inability to feed from birth or stopping feeding, seizures, fast breathing, severe chest indrawing (difficulty breathing), fever, low fever, weakness or lethargy/drowsiness (moving only when stimulated or not moving even when stimulated), jaundice, and local infection signs (umbilical redness or pus drainage, pus drainage from the skin or eyes) (4, 6, 8-10). A study found that the knowledge and care-seeking behavior of postpartum mothers about neonatal danger signs were low (11). Another study performed with 414 postpartum mothers stated that 57.2% of the mothers were not informed by healthcare professionals about neonatal danger signs before birth. In this study, 84.5% of mothers knew fewer than three neonatal danger signs. Fever (74.9%) was determined as the most common danger sign accepted by mothers after birth, and neonatal danger signs were reported as difficulty breathing (46.6%), poor sucking (40.1%), jaundice (35.3%), convulsions (11.1%), hypothermia (9.7%), and lethargy/unconsciousness (5.8%), respectively (12). In their study, Ekwochive et al. (2015) found that the rate of mothers/caregivers who knew three and more of the nine danger signs recognized by the WHO was low (0.0-30.3%). In this study, cough, diarrhea, and excessive crying were revealed as the most perceived and experienced symptoms, apart from the WHO danger signs (6). Similar studies in the literature have found that mothers' knowledge of neonatal danger signs is low and the possibility of having good knowledge is associated with the mother's and father's education level, receiving prenatal and postnatal care, access to mass media, income level, the place of birth, and the source of information (5, 9, 13-16). Therefore, prenatal care should be encouraged, postnatal care should be followed up, mothers should be educated on neonatal danger signs, and community-based health information should be disseminated (1). The causes and management of neonatal deaths have been extensively researched and defined in the literature (17-19). However, mothers' knowledge of neonatal danger signs and influencing factors with equal importance have not been adequately studied. The present study was carried out to examine mothers' knowledge of neonatal danger signs. The study also revealed the relationship between the level of knowledge and sociodemographic variables.

Research questıons

1. What is the level of mothers' knowledge of danger signs in the neonatal period?
2. What are the factors affecting mothers' knowledge of danger signs in the neonatal period?

MATERIAL AND METHOD

Ethical Consideration

Prior to the study, the researcher obtained written permission from the Ethics Committee of Harran University (Date: 16.10.2023, Decision No: 2023/19/31). Institutional permission was obtained for the study. Before the study, the researcher informed the parents and received their consent.

Research Type

This is a descriptive study.

Study Sample/Participants

The study was conducted in a province in the southeast of Turkey. According to the power analysis performed in line with a similar study in the literature (14), the minimum sample size was determined as 210 mothers at a medium effect size, with an 80% power and 0.05 type error. The study was carried out with 214 mothers in total.

The criteria for inclusion in the sample were determined as volunteering to participate in the study, the absence of a defined mental illness, being at least literate, and having an infant younger than 12 months. The sample of this study consisted of mothers with infants between 0-12 months (9, 13, 20, 21), in line with the literature. Considering the

possibility of not remembering the symptoms in the neonatal period, mothers with infants over 12 months old were not included in the study. Mothers not meeting the inclusion criteria were excluded from the study.

Instruments

Mother information form: The mother information form consists of a total of 23 open-ended and multiple-choice questions about the mother's age, education level, employment status, marital status, family type, income status, and the number of children.

Neonatal danger signs form: This form is a questionnaire consisting of open-ended and multiple-choice questions prepared by the researchers in line with the literature (4, 6, 8-10). The first question included the nine neonatal danger signs determined by the World Health Organization (WHO). In the first question, mothers with children younger than 12 months were asked to list the neonatal danger signs that they regarded as serious health problems and that could potentially endanger a newborn's life. In addition to these symptoms, the most frequently reported signs/symptoms in the literature, such as excessive crying, vomiting, diarrhea, and cough, were also asked (6, 9, 10). The mothers were asked whether they experienced these symptoms and whether they sought help from the health institution after these symptoms. This form also included questions about the reasons for not applying to health institutions when they did not want help, the status of receiving education on neonatal danger signs/infant care and information resources, using social media/the internet, and finding them reliable.

Neonatal danger signs are danger signs recognized by the World Health Organization (WHO) in case of a serious illness or local infection (4). The "neonatal danger signs" recognized by the WHO have been reported as follows (4, 6, 8-10):

- Not feeding or stopping feeding since birth
- Convulsion
- Respiratory rate of 60 or higher (fast breathing)
- Severe chest indrawing (difficulty breathing)
- Fever (Temperature ≥ 37.5 degrees Celsius)
- Hypothermia (Temperature ≤ 35.5 degrees Celsius)
- Weakness or lethargy/drowsiness (Moving only when stimulated or not moving even when stimulated)
- Signs of jaundice
- Signs of local infection (Umbilical redness or pus discharge, boils on the skin or pus drainage from the eyes)

Information: It refers to the awareness level of mothers of neonatal danger signs. There are 13 danger signs to assess the mother's knowledge of neonatal danger signs. The knowledge score was calculated by giving a score of "1" for the "correct" answer given by the mothers to the danger signs form and "0" for the "wrong or I have no idea" answer. In this study, 13 danger signs were created in line with the literature on danger signs (4, 6, 8-10). The total score varies between 0 and 13. By taking similar studies in the literature as a reference (14), the mothers' knowledge score was evaluated as "good" in those with equal or above the average total knowledge and as "poor" in those below the average. In this study, mothers who knew 6 and more symptoms were evaluated as having "good" knowledge.

Research Variables

In the present study, the mother's and infant's demographic data (mother's age, education level, father's education level, income status, etc.) are the independent variables of the study, and the neonatal danger signs knowledge score is the dependent variable.

Data Collection

The research data were collected between April 2022 and January 2023 in the hospital with a neonatal intensive care unit, neonatal clinics, and infant clinics using the "Mother Information Form" and "Neonatal Danger Signs Form." Mothers who had infants under 12 months of age were asked whether they knew and experienced danger signs/symptoms in the neonatal period and whether they sought help from the health institution after these symptoms. The research data were collected by the face-to-face interview method, and data collection lasted about 10 minutes.

Data Analysis

The data were evaluated with descriptive statistics and logistic regression analysis in the IBM SPSS V23 program. Number, percentage, mean, and standard deviation were used for the descriptive characteristics of the study participants. Logistic regression was used to determine the relationship between the knowledge of danger signs and demographic variables. The statistical significance level was accepted as $p<.05$.

RESULTS

Sociodemographic Characteristics of the Participants

Table 1 contains the participants' demographic data. The mothers' mean age was 27.48±5.96 (min 17-max 43), 34.1% were in the 17-24 age range, and 30.8% were illiterate. It was revealed that the mothers' mean number of children was 3.4±2.16 (min 1-max 11), 25.7% had five and more children, and 82.2% lived in extended families. Of the mothers, 65.9% received prenatal care.

The fathers' mean age was 32.78±9.57 (min 17-max 65), and 34.1% were 35 years old and older. The infants' mean age was 4.88±3.30 months, 58.9% were boys, 57% were born in the normal way, 58.9% were born as a result of a planned pregnancy, and 98.1% were born in a health institution. Of the infants, 24.8% were the mothers' first infants. **Table 1** contains other descriptive data.

Table 1. Distribution of the mother's and infant's demographic information (n=214).

	Frequency (n)	Percentage (%)
Mother's Age		
17-24	73	34.1
25-29	53	24.8
30-34	46	21.5
35 and older	33	15.4
Mother's Education Level		
Illiterate	66	30.8
Primary education	124	57.9
High school and above	24	11.2
Mother's Employment Status		
Yes	15	7
No	199	93
Father's Age		
17-24	32	15
25-29	57	26.6
30-34	52	24.3
35 and older	73	34.1
Father's Education Level		
Illiterate	26	12.1
Primary education	135	63.1
High school	53	24.8
Income-Expense Status		
Good	27	12.6
Medium	146	68.2
Poor	41	19.2
Family Type		
Nuclear family	38	17.8
Extended family	176	82.2
Number of Children		
1	48	22.4
2	41	19.2
3	33	15.4
4	35	16.4
5 and more	55	25.7
Infant's sex		
Female	88	41.2
Male	126	58.9
Mode of delivery		
Vaginal delivery	122	57
Cesarean section	92	43
Infant's birth time		
Born preterm (preterm)	46	21.5
Born at term (term)	160	74.8
Born late (postterm)	8	3.7
Is the pregnancy planned?		
Yes	126	58.9
No	88	41.2
Is it the mother's first infant?		
Yes	53	24.8
No	161	75.2
Did the mother receive prenatal care?		
Yes	141	65.9
No	73	34.1
The presence of a person supporting the mother		
Yes	136	63.6
No	78	36.4
Did you receive education on danger signs?		
Yes	59	27.6
No	155	72.4
From whom did you receive the education?*		
Health worker	82	38.3
Family members	120	56.1
Social media	87	40.6
Others (neighbor, friend, etc.)	33	15.4

*More than one answer was given.

Mothers' Knowledge of Neonatal Danger Signs

Table 2 contains data on mothers' knowledge and experience of danger signs and taking their infants to the health institution. As danger signs, the mothers reported cough and diarrhea at the highest rate of 81.8%, high fever at 80.4%, vomiting and malnutrition at 79%. Excessive crying and low fever were reported at the lowest rate of 60.3%. Considering the danger signs experienced by the mothers in their infants, they experienced vomiting and high fever most frequently at 60.3%. High fever, cough, diarrhea, and vomiting were reported as the danger signs by the mothers at the highest rate as the reasons for applying to health institutions. **Table 2** contains results for other danger signs (**Table 2**).

The mean danger signs knowledge score of the mothers was found to be 9.78±3.41. It was evaluated that the knowledge of 88.3% was at a "good" level, while the knowledge of 11.7% was at a "low" level (**Table 3**).

Table 3. Mothers' knowledge of danger signs (n=214).

Number of symptoms	n	%
2 symptoms	10	4.7
3 symptoms	8	3.7
4 symptoms	3	1.4
5 symptoms	4	1.9
6 and more symptoms	189	88.3
Total	214	100

Factors Associated with the Maternal Knowledge of Neonatal Danger Signs

In **Table 4**, the factors affecting the maternal knowledge of danger signs (high/low) were examined by binary logistic regression analysis. According to the analysis results, the variables of parental age, parental education level, family type, number of children, receiving education on danger signs, and the planned status of pregnancy did not affect maternal knowledge ($p>0.05$), but only the family's income status had a statistically significant effect ($p<0.05$).

DISCUSSION

This study determined that 81.3% of the mothers had a good level of knowledge of danger signs and their mean knowledge score was 9.78±3.41. The maternal knowledge level in the present research was found to be higher compared to some studies in the literature (5-7, 11, 12, 22). The meta-analysis by Demis et al. (2020) reported that there was no standard in the studies in the literature for determining the knowledge level of mothers and the knowledge level was evaluated according to the knowledge of at least 1-6 symptoms. In this study, the knowledge of 6 and more symptoms, which is the average of the total number of symptoms, was evaluated as "good." From this point of view, it

Table 2. Distribution of neonatal danger signs (n=214).

Danger Sign	Knowledge		Experience		Presenting to a health institution	
	n	%	n	%	n	%
The inability to feed since birth or stopping feeding	169	79.0	74	34.6	56	26.2
Seizures/Convulsion	160	74.8	28	13.1	26	12.1
Fast breathing (respiratory rate of 60 or higher)	160	74.8	68	31.8	59	27.6
Severe chest indrawing (difficulty breathing)	163	76.2	90	42,1	76	35.5
Fever (temperature ≥ 37.5 degrees)	172	80.4	129	60.3	115	53.7
Low fever (temperature ≤ 35.5 degrees)	129	60.3	35	16.4	24	11.2
Weakness/immobility or lethargy/drowsiness (Moving only when stimulated or not moving even when stimulated)	159	74.3	53	24.8	36	16.8
Jaundice	167	78.0	83	38.8	68	31.8
Umbilical redness or pus drainage, boils on the skin or pus drainage from the eyes	165	77.1	57	26.6	47	22
Diarrhea	175	81.8	125	58.4	107	50
Excessive crying	129	60.3	108	50.5	63	29.4
Vomiting	169	79.0	129	60.3	106	49.5
Cough	175	81.8	151	70.6	131	61.2

*More than 1 answer was given to this question by the mothers.

Table 4. Logistic regression results.

	Good n (%)	Poor n (%)	Multivariate (Enter)1	
			OR (95% CI)	p
Mother's age				
17-24 years	62 (32.8)	11 (44)	1	
25-29 years	47 (24.9)	6 (24)	0.218 (0.014 – 3.295)	0.271
30-34 years	39 (20.6)	7 (28)	0.234 (0.018 – 3.124)	0.272
35 years and older	32 (16.9)	1 (4)	0.128 (0.012 – 1.331)	0.085
Mother's education level				
Illiterate	57 (30.2)	9 (36.0)	1	
Primary education	110 (58.2)	14 (56.0)	1.964 (0.631- 6.110)	0.244
High school and above	22 (11.6)	2 (8.0)	3.734 (0.521- 26.764)	0.190
Father's age				
17-24 years	25 (13.2)	7(28.0)	1	
25-29 years	50 (26.5)	7(28.0)	2.578 (0.628 – 10.579)	0.189
30-34 years	47 (24.9)	5(20.0)	2.469 (0.442 – 13.791)	0.303
35 years and more	67 (35.4)	6(24.0)	2.154 (0.335 – 13.870)	0.419
Father's education level				
Illiterate	24 (12.7)	2 (8.0)	1	
Primary education	119 (63.0)	16 (64.0)	0.380 (0.61 – 2.350)	0.298
High school and above	46 (24.3)	7 (28.0)	0.301 (0.037 – 2.433)	0.260
Family type				
Nuclear family	31 (16.4)	7 (28.0)	1	
Extended family	158 (83.6)	18 (72.0)	2.596 (0.759 – 8.881)	0.129
Income status				
Good	20 (10.6)	6 (24.0)	1	
Medium	132 (69.8)	14 (56.0)	4.103 (1.200 – 14.034)	0.024*
Poor	36 (19.0)	5 (20.0)	2.357 (0.551 – 10.868)	0.272
Number of children				
1	40 (21.2)	8 (32.0)	1	
2	36 (19.0)	5 (20.0)	1.212 (0.302 – 4.859)	0.786
3	29 (15.3)	4 (16.0)	0.992 (0.200 – 4.917)	0.992
4	31 (16.4)	4 (16.0)	1.122 (0.184 – 6.832)	0.901
5 and more	52 (27.5)	3 (12.0)	1.553 (0.213 – 11.349)	0.664
Receiving education				
Yes	50 (26.5)	9 (36.0)	1	
No	139 (73.5)	16 (64.0)	1.224 (0.436 – 3.431)	0.701
Is the pregnancy planned?				
Yes	111 (58.7)	15 (60.0)	1	
No	77 (40.7)	10 (40.0)	1.22 (0.421 – 3.533)	0.714
Constant			3.082	0.535

Cox&Snell R2=0.78; Nagelkerke R2=0.151; Hosmer and Lemeshow Chi-Square=3.553, p=0.895; Accuracy= 88.1%, *p<0.05

can be said that the knowledge level of mothers was quite high (16). Similar to this study, a study evaluating the knowledge of mothers according to six and more danger signs reported that 11.7% of mothers had good knowledge (14). A study from Iraq determined that 81% of mothers (8) and another study reported that 15.5% of mothers (12) knew three and more danger signs. A study from Saudi Arabia indicated that 37% of mothers (4) knew three and more danger signs. This study found mothers' knowledge of neonatal danger signs to be quite high, unlike studies in the literature, which is thought to be associated with the health services provided in the place where the study was conducted and the countries' conditions.

As danger signs, the mothers reported cough and diarrhea at the highest rate of 81.8%, high fever at 80.4%, vomiting and malnutrition at 79%. Excessive crying and low fever were reported at the lowest rate of 60.3% (**Table 2**). The results of this study are similar to the findings of some studies in the literature. High fever is the danger sign known at the highest rate in most studies (5, 8, 11, 12, 14, 23). The study conducted by Berhane et al. (2018) with 422 mothers/caregivers in Ethiopia reported that mothers knew high fever (74.3%), diarrhea (68.3%), vomiting (60.5%), and feeding difficulty (49.8%) at the highest rate among the 13 symptoms asked and knew jaundice, local infection, altered state of consciousness and convulsions at the lowest rate, and 65.3% had insufficient knowledge (5). Another study by Bulto et al. (2019) revealed that only 20.3% of mothers had good knowledge and indicated fever, feeding difficulty, and respiratory distress at the highest rate among the danger signs (11). In the study by Abdulrida et al. (2018), fever, feeding difficulty, and jaundice were determined as symptoms known at the highest rate, while hypothermia and local infection symptoms were found at the lowest rate (8). The study by Degefa et al. (2019) indicated that 40.9% of mothers had good knowledge of the danger signs and fever (33%) was known at the highest rate (9). In the study by Awasti et al. (2006), more than 50% of mothers defined fever, irritability, abdominal distention, slow breathing, and diarrhea as danger signs at the highest rate (23). The meta-analysis by Demis et al. (2020) examining studies on danger signs reported that 40.7% of mothers had sufficient knowledge and this rate was quite low (16). A study from Nigeria indicated that mothers' knowledge of three and more neonatal danger signs was 30.3% and their knowledge was insufficient, and fever was known at the highest rate of 95.2% (6).

Influencing Factors

In this study, considering the effects of the variables related to the mother, father, and infant on mothers' knowledge score, no significant difference was found as a result of the analysis, except for the income status (**Table 4**). The study by Jemberia et al. reported that maternal age, marital status, education level of parents, and receiving information about danger signs affected the status (14). The study by Kibaru et al. (2016) indicated that maternal education and receiving education on danger signs affected the condition significantly (12). The study by Bulto et al. (2019) stated that mothers' knowledge score was significantly affected by the mother's education level, status of receiving postpartum education/consultancy on neonatal care, and status of experiencing danger signs in the infant, but it was not affected by the mother's place of birth and place of residence (11). Upon examining the factors affecting the knowledge level of mothers about danger signs, it was reported that the education level of parents, their occupation, income status, and the follow-up status in the health center significantly affected the knowledge, while the mother's age, family size, and the marital status of the mother did not affect it (5). In their study, Ekwochi et al. (2015) reported that the mother's sociodemographic characteristics did not affect the knowledge status (6). Degefa et al. (2019) indicated that maternal education status and participation in postnatal care significantly affected the knowledge level. The education level of those with secondary school education was found to be 5.6 units higher than those without education, and 2.6 units higher in those who participated in postnatal care than those who did not (9). Another study revealed that the mother's knowledge was affected by her education level, occupation, and visits to the antenatal care unit, whereas it was not affected by the number of children and the presence of people supporting the mother (8). The study by Prajapati et al. (2016) stated that maternal age and obtaining information about danger signs did not affect the status (7). The meta-analysis examining 14 studies to determine danger signs and influencing factors of mothers reported that the high education level of parents, the access to the media, the number of receiving prenatal care, giving birth in health institutions, and the postnatal follow-up status significantly affected the knowledge of mothers (16).

What do Mothers do in Case of a Danger Sign?

The studies examined mothers' status of taking their infants to health institutions when they experienced danger signs. This study found the rate of presenting to a health institution as low despite the high rate of mothers experiencing symptoms. However, the study also found that mothers most commonly presented to health facilities with symptoms of umbilical redness or pus drainage, boils on the skin or pus discharge from the eyes, vomiting and fever (**Table 2**). Bulto et al. reported that 60.5% of mothers immediately took their infants to a health institution in case of a danger sign, whereas another study (23) indicated that traditional practices were applied. The study conducted by Ekwochi et al. in 2015 stated that 47.7% of mothers took their infants to

the hospital, but 23% preferred home care (6). A study from Iraq reported that 71.7% of mothers preferred to present to the hospital (8). Although mothers experience danger signs, the rate of presenting to health institutions is lower. This is thought to be related to mothers' insufficient knowledge about what to do in the face of danger signs. This study, it is thought that mothers consulted to health institutions more frequently with the symptom of fever compared to other danger signs due to the easy recognition of fever in children, its frequent occurrence and the knowledge of convulsions caused by fever.

CONCLUSION

This study found mothers' knowledge of neonatal danger signs to be quite high, unlike studies in the literature, which is thought to be associated with the health services provided in the place where the study was conducted and the countries' conditions. In most studies, high fever is the most easily recognized danger sign by mothers. This result may be related to the fact that fever is more common in children than other danger signs, the convulsion that will be caused by fever is known, or the presence of fever is easier to understand. Although mothers experience danger signs, the rate of presenting to health institutions is lower. This may explain the insufficient maternal knowledge of what to do in case of danger signs. Like most studies in the literature, this study found no relationship between maternal knowledge and variables such as parental age, education level, number of children, receiving prenatal care, family type, etc., but there was a relationship only with income status.

Based on the results of this study, it is recommended to inform mothers about neonatal danger signs and the practices to be done in every situation (monitoring, follow-up, treatment, control, etc.) encountered by mothers with childbirth. The mother's awareness and knowledge and the early diagnosis of problems and early intervention are important because they positively affect neonatal health.

ETHICAL DECLARATIONS

Ethics Committee Approval: Prior to the study, the researcher obtained written permission from the Ethics Committee of Harran University (Date: 16.10.2023, Decision No: 2023/19/31).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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