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Original Research Article

THE ASSESSMENT OF MOTHERS' KNOWLEDGE REGARDING NEONATAL JAUNDICE AND ITS TREATMENT

AKBAR F, QARINA Y, SHAHBAZ T, MARVA H, FALAK F, ANWAR G, SADDIQUE H, YASIN I

Ittefaq College of Nursing, Lahore, Pakistan
**Corresponding author email address:* fizaakbar25@gmail.com

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ABSTRACT

Background: *Neonatal jaundice is common in newborns, affecting about 60% of term and 80% of preterm infants in the first week of life. While most cases are benign, severe hyperbilirubinemia can lead to serious conditions like acute bilirubin encephalopathy or kernicterus, resulting in neurological damage or death. Early identification and management rely on maternal awareness, as mothers are key in recognising warning signs. In low- and middle-income countries, such as Pakistan, limited maternal knowledge can delay healthcare-seeking and increase risks.* ***Objective:*** *To assess mothers' knowledge regarding neonatal jaundice and its treatment among mothers attending a tertiary care hospital in Lahore, Pakistan.* ***Study Design:*** *Descriptive cross-sectional study.* ***Settings:*** *Sir Ganga Ram Hospital, Lahore, Pakistan.* ***Duration of Study:*** *January 2025 to June 2025.* ***Methods:*** *A total of 187 mothers of neonates were recruited using convenience sampling. Data were collected using an adopted and translated structured questionnaire comprising demographic variables and 14 knowledge-based items on the definition, causes, complications, and treatment of neonatal jaundice. Each correct response was worth 1 point, for a maximum score of 14. Knowledge levels were categorised as good (>66.6%), moderate (33.3–66.6%), and poor (<33.3%). Data analysis was performed using SPSS version 25. Descriptive statistics, including frequencies and percentages, were used to summarise the findings. Reliability of the questionnaire was assessed using Cronbach's alpha, while construct validity was examined using the Kaiser–Meyer–Olkin measure and Bartlett's test of sphericity.* ***Results:*** *Among the 187 participants, the majority were aged 26–35 years (57.8%), had matric or intermediate education (59.4%), and resided in urban areas (79.7%). Most mothers correctly identified neonatal jaundice as a yellow discolouration of the skin (84.0%) and recognised that it commonly occurs in newborns (75.4%). However, misconceptions were frequently observed. Nearly half of the participants believed that maternal dietary intake could cause jaundice (49.2%), while 36.9% attributed the condition to improper breastfeeding. Regarding complications, 62.0% believed jaundice could lead to neonatal death, and 60.4% recognized its potential to cause brain damage. Despite this awareness, 45.5% reported that they might delay seeking hospital care if jaundice developed in their newborn. Overall knowledge assessment showed that 39.0% of mothers had poor knowledge, 38.0% had moderate knowledge, and only 23.0% demonstrated good knowledge regarding neonatal jaundice and its treatment.* ***Conclusion:*** *Maternal knowledge regarding neonatal jaundice in this population was generally limited, with persistent misconceptions about its causes and management. Strengthening maternal education through antenatal counselling, postnatal guidance, and community health awareness programs may improve early recognition and timely healthcare utilisation, thereby reducing the risk of preventable complications associated with neonatal jaundice.*

Keywords: Neonatal Jaundice; Maternal Knowledge; Hyperbilirubinemia; Neonatal Health; Maternal Awareness

INTRODUCTION

hospital readmission during the early neonatal period. It is estimated that approximately 60% of term infants and up to 80% of preterm infants develop jaundice within the first week of life (1). Clinically, neonatal jaundice is characterised by yellow discolouration of the skin and sclera resulting from elevated levels of unconjugated bilirubin in the bloodstream (2). Although neonatal jaundice is usually a benign and self-limiting condition, severe hyperbilirubinemia can lead to serious complications such as acute bilirubin encephalopathy and kernicterus. These conditions may result in permanent neurological damage, including hearing impairment, cerebral palsy, intellectual disability, and even death if not managed promptly (3).

Despite considerable global progress in reducing child mortality, neonatal mortality continues to represent a major public health challenge worldwide (4). Neonatal jaundice remains one of the leading causes of hospital readmission among newborns after discharge, particularly during the first week of life when bilirubin levels typically peak (1). Hyperbilirubinemia occurs when bilirubin production exceeds the body's capacity for elimination, leading to elevated serum bilirubin concentrations. Clinically, a bilirubin level exceeding 85 mmol/L (5 mg/dL) is generally considered indicative of neonatal jaundice (5).

Globally, nearly 46% of deaths among children under five years of age occur during the neonatal period, highlighting the need for targeted interventions to improve neonatal health outcomes (6). The burden is particularly significant in low- and middle-income countries. Pakistan remains among the countries with the highest neonatal mortality rates, estimated at approximately 39 deaths per 1,000 live births (7). This alarming statistic reflects persistent gaps in neonatal healthcare services and community awareness. Limited maternal knowledge regarding early warning signs of neonatal illnesses, including jaundice, often leads to delayed identification and treatment (4). Neonatal jaundice can be broadly categorised into physiological and pathological forms. Physiological jaundice, which commonly appears between the third and fourth day after birth, results from elevated unconjugated bilirubin levels and is generally self-limiting (8). Several factors contribute to its Development, including a shortened lifespan of neonatal red blood cells (70–90 days), increased erythrocyte turnover, reduced bilirubin binding capacity, delayed initiation of breastfeeding, inadequate feeding, and delayed passage of meconium (1). In contrast, pathological jaundice typically appears within the first 24 hours of life. It may be associated with infections, drug toxicity, enzymatic deficiencies, Rhesus incompatibility between mother and fetus, hypothyroidism, or congenital biliary obstruction (9).

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Clinically, neonatal jaundice usually appears first on the face before spreading to the trunk and extremities (10). Early clinical assessment involves careful inspection of the skin and sclera for yellow discolouration, followed by neurological evaluation to detect potential complications. Phototherapy remains the most effective treatment for neonatal jaundice. This therapy utilises blue-green spectrum light to convert unconjugated bilirubin into water-soluble forms that can be excreted without hepatic conjugation (11).

Early recognition and management of neonatal jaundice during the first week of life are essential to prevent severe complications (12). However, many healthy newborns are discharged from hospitals shortly after birth, often before bilirubin levels reach their peak. As primary caregivers, mothers are usually the first individuals to observe early signs of jaundice at home (13). In settings where maternal awareness is limited, caregivers may rely on traditional practices, herbal remedies, or home-based treatments rather than seeking timely medical care (14).

Previous studies have consistently demonstrated that maternal knowledge plays a crucial role in the early detection and appropriate management of neonatal jaundice (15). However, research conducted in various settings has revealed substantial gaps in maternal knowledge regarding its causes, warning signs, complications, and treatment options (10). Inadequate awareness is frequently associated with delayed healthcare-seeking behaviour, as mothers may initially rely on traditional practices or home remedies instead of seeking medical attention (16).

In Pakistan, the prevalence of neonatal jaundice and its associated complications underscores the importance of improving maternal awareness and education. Since mothers are the primary caregivers for newborns, their ability to recognise early symptoms and seek prompt medical care is essential for preventing severe complications and improving neonatal outcomes (17). Therefore, assessing maternal knowledge regarding neonatal jaundice is important for identifying existing gaps and developing targeted educational interventions to enhance neonatal care.

METHODOLOGY

This study employed a descriptive cross-sectional design to assess mothers' knowledge regarding neonatal jaundice and its treatment. The study was conducted at Sir Ganga Ram Hospital, Lahore, Pakistan, a tertiary care public hospital that provides maternal and neonatal healthcare services to a large population. Data collection was conducted over approximately six months from January 2025 to June 2025 in the hospital's outpatient department and nursery units, where mothers commonly visit for neonatal examinations and follow-up care. The study population consisted of mothers of neonates attending these units during the study period.

A convenience sampling technique was used to recruit participants who met the eligibility criteria and agreed to participate in the study. The required sample size was determined using Solvin's formula for finite populations. Considering an estimated population size of 350 mothers visiting the selected departments and a margin of error of 5%, the calculated sample size was 187 participants. Mothers who had delivered live neonates and visited the outpatient department for neonatal follow-up or whose newborns were admitted to the nursery were eligible for inclusion. Mothers who were healthcare professionals were excluded to avoid professional knowledge bias. In addition, mothers with cognitive or severe psychological impairment, critically ill mothers, and mothers visiting the emergency department were excluded because these conditions could interfere with their ability to participate effectively in the study.

Data were collected using an adopted and translated questionnaire previously used in a similar study assessing maternal knowledge regarding neonatal jaundice. The questionnaire was translated into Urdu to ensure better comprehension among participants. The tool consisted of two sections. The first section collected demographic information of the participants, including age, educational level, and place of residence. The second section consisted of 14 items designed to assess mothers' knowledge regarding neonatal jaundice, including its definition, causes, complications, and treatment. Each correct response was assigned one point, resulting in a maximum possible score of 14. Based on the total score, knowledge levels were categorised into three groups: good knowledge (>66.6% of the total score), moderate knowledge (33.3%–66.6%), and poor knowledge (<33.3%).

Prior to the commencement of data collection, permission was obtained from the administration of Ittefaq College of Nursing and the relevant authorities of Sir Ganga Ram Hospital. Eligible mothers were approached in the outpatient department and nursery units and were informed about the purpose and objectives of the study. Written informed consent was obtained from each participant before participation. Mothers who could read Urdu completed the questionnaire independently. In contrast, participants with difficulty reading were assisted by the researchers, who explained each question aloud and recorded their responses. Confidentiality and anonymity of all participants were ensured throughout the study.

The collected data were coded and entered into the Statistical Package for Social Sciences (SPSS) version 25 for analysis. Descriptive statistical methods were applied to summarise the findings. Categorical variables, including demographic characteristics and knowledge responses, were presented as frequencies and percentages. The reliability of the knowledge assessment tool was evaluated using Cronbach's alpha coefficient to determine the internal consistency of the questionnaire. Construct validity of the scale was assessed using the Kaiser–Meyer–Olkin measure of sampling adequacy and Bartlett's test of sphericity. In addition, the normality of the knowledge score distribution was examined using the Kolmogorov–Smirnov test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 187 mothers participated in the study assessing knowledge regarding neonatal jaundice and its treatment. The demographic analysis showed that the majority of participants were aged 26–35 years (57.8%), followed by 18–25 years (26.2%), while 16.0% were aged 36–45 years. Regarding educational status, 59.4% of mothers had matric/intermediate education, 26.7% were uneducated, and 13.9% had B.A. level education. In terms of residence, most participants lived in urban areas (79.7%), whereas 20.3% lived in rural areas (Table 1).

Table 1: Demographic Characteristics of Participants (n = 187)

Variable	Category	Frequency (n)	(%)
Age	18–25 years	49	26.2
	26–35 years	108	57.8
	36–45 years	30	16.0
Education	Uneducated	50	26.7
	Matric/Intermediate	111	59.4
	B.A	26	13.9
Residence	Urban	149	79.7
	Rural	38	20.3

The assessment of mothers' knowledge regarding neonatal jaundice revealed varying levels of awareness about its definition, causes, complications, and management. A large proportion of respondents (84.0%) correctly identified neonatal jaundice as a yellow discolouration of the skin, while 75.4% recognized it as a common

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condition among newborns. However, misconceptions were also observed, as 36.9% of mothers believed that improper breastfeeding causes jaundice, and 49.2% reported that maternal food intake could lead to jaundice. More than half of the participants (53.5%) believed that jaundice may last for about two weeks. Regarding severity and complications, 62.0% of mothers believed that jaundice could cause neonatal death, and 60.4% recognized that it may damage the child's brain. However, 45.5% indicated they might wait before seeking hospital care, reflecting gaps in appropriate healthcare-seeking behaviour. In addition, 69.5% believed that a baby may show abnormalities during jaundice, and 65.2% reported that infections can cause neonatal jaundice. In comparison, 47.1% recognized blood group incompatibility between mother and baby as a possible cause. Some misconceptions regarding causes and complications were also evident. About 23.0% of participants believed that cold water can cause jaundice, while 53.5% believed that jaundice could lead to convulsions later in life. Furthermore, 38.5% of mothers thought that jaundice could cause blindness, indicating partial awareness of possible complications (Table 2).

Table 2: Mothers' Knowledge Regarding Neonatal Jaundice (n = 187)

Knowledge Item	Yes n (%)	No n (%)
Jaundice is a yellow discolouration of the skin	157 (84.0)	30 (16.0)
Jaundice is common in newborns	141 (75.4)	46 (24.6)
Caused by improper breastfeeding	69 (36.9)	118 (63.1)
Jaundice lasts for two weeks	100 (53.5)	87 (46.5)
Food causes jaundice	92 (49.2)	95 (50.8)
Can cause neonatal death	116 (62.0)	71 (38.0)
Can damage a child's brain	113 (60.4)	74 (39.6)
Waiting before seeking hospital care	85 (45.5)	102 (54.5)
The baby shows abnormalities during jaundice	130 (69.5)	57 (30.5)
Blood group incompatibility causes jaundice	88 (47.1)	99 (52.9)
Cold water causes jaundice	43 (23.0)	144 (77.0)
Infection causes jaundice	122 (65.2)	65 (34.8)
Jaundice causes convulsions later	100 (53.5)	87 (46.5)
Jaundice causes blindness	72 (38.5)	115 (61.5)

The overall knowledge scores were categorised into three levels: low, average, and high knowledge. The results showed that 39.0% of mothers had low knowledge, 38.0% demonstrated average knowledge, and only 23.0% had high knowledge regarding neonatal jaundice and its treatment, indicating that a considerable proportion of mothers possess inadequate knowledge about the condition (Table 3).

Table 3: Overall Knowledge Level of Mothers (n = 187)

Knowledge Level	Frequency (n)	Percentage (%)
Low Knowledge	73	39.0
Average Knowledge	71	38.0
High Knowledge	43	23.0
Total	187	100

DISCUSSION

The present study assessed mothers' knowledge regarding neonatal jaundice and its treatment among mothers attending Sir Ganga Ram Hospital, Lahore. The study utilised a descriptive cross-sectional design and applied descriptive statistical methods to analyse the collected data. Normality testing, reliability assessment, and validity testing were performed to ensure the accuracy and consistency of the results. The findings indicated that the majority of participants were in the 26–35-year age group (57.8%), with most mothers having matric or intermediate-level education (59.4%). Additionally, a large proportion of participants were residents of urban areas (79.7%), while a smaller percentage were from rural regions (20.3%).

These demographic findings are comparable with those reported in other studies conducted in different settings. A study conducted in Nigeria in 2020, examining mothers' knowledge, beliefs, and practices regarding neonatal jaundice, reported that most participants were aged between 26 and 30 years and 31–35 years, accounting for 24.1% and 37% of the sample, respectively, while 37.1% of participants had university-level education (18). Similarly, a 2022 study in Iraq among primigravidas reported that approximately 32.12% of participants were aged 26 to 35 years, 50.90% had secondary-level education, and 69.09% resided in urban areas (19). These similarities suggest that maternal demographic characteristics observed in the present study are consistent with those reported in comparable international research.

In the current study, most participants demonstrated awareness of the basic definition of neonatal jaundice, with 84.0% correctly identifying jaundice as yellow discolouration of the skin and 75.4% recognizing it as a common condition among neonates. However, misconceptions regarding its causes were also evident. Nearly half of the participants (49.2%) believed that maternal dietary intake could contribute to the development of neonatal jaundice. Comparable findings were reported in a study conducted in Khyber Pakhtunkhwa, Pakistan, where 80.25% of participants correctly identified jaundice as yellow discolouration. However, awareness that it is a common neonatal condition was lower (17%). Furthermore, 68.50% of participants in that study believed that maternal food intake could cause neonatal jaundice, indicating a higher level of misconception compared with the current findings (1).

Similar misconceptions have been reported in other countries. A study conducted in Nepal evaluating maternal knowledge regarding neonatal jaundice reported that 87% of participants correctly identified the definition of jaundice and 97% recognized it as a common neonatal condition. However, a large proportion (87%) believed that maternal dietary intake could cause neonatal jaundice, highlighting the persistence of incorrect beliefs regarding its aetiology (20).

The present study also revealed gaps in knowledge regarding the causes of neonatal jaundice. While 63.1% of participants believed that improper breastfeeding could lead to jaundice, more than half of the respondents (52.9%) were unaware that blood group incompatibility between the mother and infant could cause the condition. In addition, 34.8% of participants did not recognise infection as a potential cause. Similar findings were reported in a study conducted in Iraq, where 44.8% of participants lacked knowledge regarding infection and blood group incompatibility as risk factors for neonatal jaundice (19). Likewise, a study conducted in Pakistan reported that a majority of mothers believed breastfeeding causes jaundice (89.25%). In comparison, 76.50% and 57.75% were unaware that blood group incompatibility and infection could contribute to neonatal jaundice, respectively (17).

The present study also identified inadequate knowledge regarding the severity and potential complications of neonatal jaundice. Nearly half of the participants (54.5%) indicated that they might delay seeking hospital care, which may increase the risk of complications. Furthermore, substantial proportions of mothers were unaware that neonatal jaundice could result in serious complications such as convulsions (46.5%) and blindness (61.5%). Additionally, 38.0% and

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39.6% of participants did not recognise that untreated neonatal jaundice could lead to neonatal death or permanent brain damage.

Similar findings have been reported in other settings. A study conducted in rural northern Nigeria reported limited maternal awareness regarding complications of neonatal jaundice. Only 22% of respondents recognised disability as a possible outcome, and only 1% identified brain damage as a complication. Furthermore, 23.3% and 11.6% of participants reported relying on traditional or home remedies, while only 52.9% indicated seeking hospital treatment (21). Another study conducted in Nigeria reported that 20.48% of mothers were unaware that neonatal jaundice could result in death. Additionally, 29.17% believed that sunlight exposure could treat jaundice, while only 48.21% reported seeking hospital care (18).

Overall, the findings of the present study highlight significant gaps in maternal knowledge regarding neonatal jaundice, particularly in relation to its causes, complications, and appropriate healthcare-seeking behaviour. These findings emphasise the need for targeted educational interventions aimed at improving maternal awareness regarding early identification and management of neonatal jaundice in order to reduce preventable neonatal morbidity and mortality.

CONCLUSION

The study indicates that mothers possess basic awareness of neonatal jaundice; however, important gaps remain in their understanding of its causes, complications, and timely treatment. Misconceptions and delayed healthcare-seeking behaviour were common among a substantial proportion of participants. Strengthening maternal education during antenatal and postnatal care may improve early recognition and prompt management of neonatal jaundice, thereby reducing preventable neonatal complications.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBEC-ITFQCN-75/25)

Consent for publication

Approved

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

FIZA AKBAR
Conceived the study, coordinated data collection, performed analysis, and prepared the first draft of the manuscript
Provided academic supervision, contributed to study design, and critically reviewed the manuscript.

YASHRAB QARINA
Assisted in data collection, literature review, and manuscript preparation

TAIBA SHAHBAZ
Participated in data acquisition, data entry and results organization

HAFIZA MARVA
Contributed to survey administration, documentation and preliminary analysis

FARZANA FALAK (STUDENTS)
Assisted in the compilation of results, referencing and proofreading

GHUZALA ANWAR (SUPERVISOR)
Provided academic supervision, contributed to study design, and critically reviewed the manuscript.

HUAMIRA SADDIQUE (ASSISTANT PROFESSOR), IQRA YASIN (PRINCIPAL)
Provided academic supervision, contributed to study design, and critically reviewed the manuscript.

All authors read and approved the final version of the manuscript.

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