

PERCEPTIONS, PRACTICES AND TRADITIONAL BELIEFS TOWARD
NEONATAL JAUNDICE AND ITS MANAGEMENT AMONG IRAQI
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ABSTRACT

Background: Neonatal jaundice (NNJ) is one of the most common neonatal conditions worldwide. Although usually benign, severe or inadequately managed hyperbilirubinemia may result in preventable neurological damage, long-term disability, or death. Mothers' knowledge, beliefs, and practices are important for early recognition and appropriate management. **Aim:** To assess mothers' perceptions, practices, and traditional beliefs regarding neonatal jaundice and to determine their associations with selected socio-demographic characteristics. **Methods:** A cross-sectional study was conducted from February to May 2018 at postnatal care clinics in ten primary health care centers in Baghdad Al-Karkh. Mothers who had delivered within one month before recruitment were included. Data were collected using a structured questionnaire covering socio-demographic characteristics, knowledge of neonatal jaundice, its causes and complications, management practices, and traditional beliefs. **Results:** Overall, 61.0% of participating mothers had an acceptable level of perception regarding neonatal jaundice, while 30.8% demonstrated a good level. Significant associations with mothers' perception were observed for working status ($p=0.05$) and having previously received information about neonatal jaundice ($p=0.013$). **Conclusion:** Despite generally acceptable perceptions, important misconceptions regarding risk factors, treatment, maternal practices, and traditional beliefs persist. Targeted maternal health education programs are recommended to improve awareness, promote early recognition, and encourage appropriate management of neonatal jaundice.

KEYWORDS: Neonatal jaundice; Maternal perception; Maternal practices; Traditional beliefs.

INTRODUCTION

The neonatal period, extending from birth through the first 28 days of life, represents one of the most critical stages for infant survival and development.^[1] During this period, neonatal jaundice (NNJ) is among the most frequently encountered clinical conditions, affecting approximately 50–60% of full-term newborns and up to 80% of preterm infants.^[2,3] It is an important cause of healthcare utilization and has been reported to account for a substantial proportion of hospital readmissions during the first week of life.^[4] Neonatal jaundice is characterized by yellow discoloration of the skin, sclera,

and mucous membranes resulting from increased serum bilirubin concentrations. In most affected neonates, jaundice is related to unconjugated hyperbilirubinemia. Clinically visible jaundice generally appears when serum bilirubin reaches approximately 5 mg/dL or higher.^[5,6] Most cases are physiological and resolve without serious consequences. However, pathological or severe hyperbilirubinemia may occur as a result of hemolytic disorders, liver disease, infection, metabolic abnormalities, or other underlying conditions and requires prompt assessment and management.^[7,8] Failure to recognize and appropriately manage severe

hyperbilirubinemia may result in bilirubin-induced neurological dysfunction and kernicterus. Affected infants may develop serious long-term neurodevelopmental consequences, including cerebral palsy, sensorineural hearing loss, intellectual impairment, and developmental delay.^[9,10] Kernicterus is also associated with considerable mortality and long-term morbidity among survivors.^[11] The burden of severe NNJ is particularly concerning in developing countries, where its incidence has been reported to be substantially higher than in developed countries.^[12] Early recognition of neonatal jaundice is essential because many newborns develop visible jaundice after discharge from healthcare facilities. In uncomplicated deliveries, jaundice commonly becomes apparent during the first few days after birth; therefore, mothers are often the first individuals to recognize its manifestations.^[13] Breastfed infants may also have inadequate milk intake during the early postnatal period, increasing the risk of dehydration and hyperbilirubinemia.^[14] Maternal knowledge and practices consequently play an important role in the timely recognition and appropriate management of neonatal jaundice. Poor awareness of its clinical manifestations, risk factors, complications, and appropriate treatment may lead to delayed healthcare seeking, inappropriate traditional practices, and potentially preventable complications.^[15] Providing mothers with appropriate health education may improve their ability to recognize jaundice, seek medical care promptly, and avoid potentially harmful practices.^[16] Therefore, assessing maternal perceptions, practices, and traditional beliefs regarding neonatal jaundice is important for identifying knowledge gaps and developing effective maternal health education interventions.

METHODS

A cross-sectional study with analytical elements was conducted from February 1 to May 31, 2018, at postnatal and neonatal care clinics in primary health care centers (PHCCs) affiliated with Al-Karkh Health Directorate, Baghdad, Iraq. A convenience sampling technique was used to recruit approximately 300 Iraqi mothers who had delivered within one month before enrollment. Five of the ten health sectors in Al-Karkh Directorate were selected based on accessibility, and two PHCCs were selected from each sector, giving a total of ten participating centers. The selected sectors were Abu Ghraib, Al-Karkh, Al-Adil, Al-Amil, and Al-Kadhimiya. Eligible participants included mothers attending postnatal, neonatal follow-up, or immunization clinics who had delivered within the preceding month, irrespective of parity. Mothers with mental disorders, those whose newborns had died or were admitted to neonatal intensive care units, and those who declined participation were excluded. Data were collected through face-to-face interviews using a structured questionnaire. The questionnaire covered maternal socio-demographic characteristics, previous information and experience

regarding neonatal jaundice (NNJ), perceptions and knowledge, and maternal practices and traditional beliefs. Knowledge was assessed using 14 items addressing the definition, causes, warning signs, complications, and appropriate responses to NNJ. Responses were scored on a three-point scale (Yes, Don't know, and No), and the total perception score was classified as poor (0–28), acceptable/fair (29–34), or good (35–42). Practices and traditional beliefs included feeding practices and the use of fluorescent light, glucose water, garlic, and yellow beads.

Interviews were conducted twice weekly and lasted approximately 10–15 minutes. Ethical approval was obtained from Al-Karkh Health Directorate, and verbal informed consent was obtained from all participants. Data were analyzed using SPSS version 24. Descriptive statistics included frequencies, percentages, means, standard deviations, and ranges. Associations between categorical variables were examined using Pearson's chi-square test, Yates' correction, or Fisher's exact test when appropriate. A **p-value** ≤ 0.05 was considered statistically significant.

RESULTS

During the study period 300 mothers, who gave birth in less than one month were interviewed using a structured questionnaire with their sociodemographic characteristics are presented in table 1; were about three quarter of them of 19-34 years of age leaving a 12% and 12.7% of the two high risk age group (<19 and ≥ 35 years respectively). Those who living in urban area contributed (65.3%), 89% were not working, most of them their educational level was read and write (30%), as shown in table 1.

Table 1: Sociodemographic characteristics of the participants (n=300).

		No	%
Maternal age	<19	36	12.0
	19-34	226	75.3
	≥ 35	38	12.7
Residence	Urban	196	65.3
	Rural	104	34.7
Occupation	Not working	267	89.0
	Worker	33	11.0
Education level	Illiterate	20	6.7
	Read & write	90	30.0
	Primary	50	16.7
	Intermediate	41	13.7
	Secondary	18	6.0
	College & Higher	81	27.0

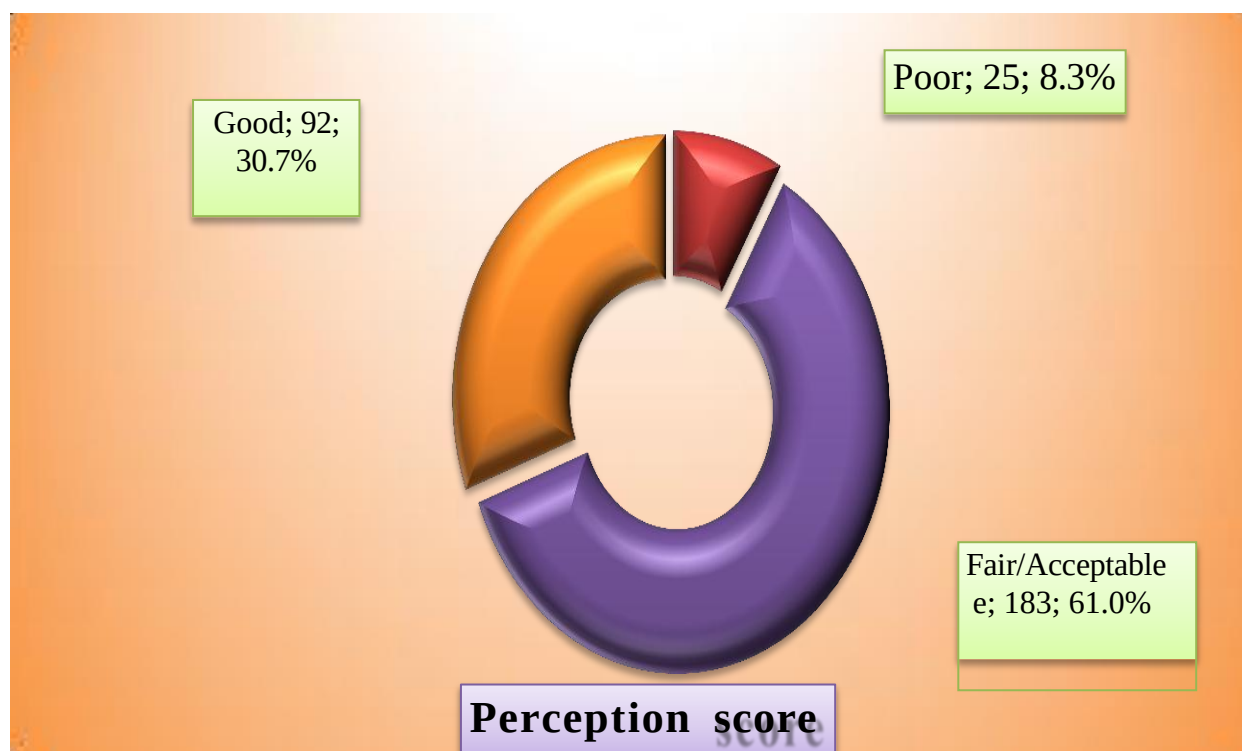
Regarding mothers who had informed about NNJ only 19% of the them were informed about NNJ. 52% of mothers included in the study had children with previous neonatal jaundice (Table 2).

Table 2: Distribution of participants by previous experience or informed about NNJ.

		No	%
Mothers who had informed about NNJ	Yes	57	19.0
Had children with previous neonatal jaundice	No	243	81.0

Perception categorized into good, acceptable and poor (according to the quartile score), 30.7% had good

perception, 61% acceptable and only 8.3% had poor perception as shown in figure 1.

**Figure 1: Distribution of total perception score of the participants.**

Regarding maternal practices and traditional beliefs related to neonatal jaundice (NNJ), 69.7% of mothers reported exclusively breastfeeding their newborns, while the remaining mothers used either bottle feeding or mixed feeding. A considerable proportion (81.0%) believed that exposure to sunlight or fluorescent light

was beneficial for the management of NNJ. In addition, 61.0% reported using traditional or home-based practices, including giving glucose water and placing yellow beads or garlic in the newborn's clothes, as measures believed to help treat or relieve neonatal jaundice (Table 3).

Table 3: Maternal practices and traditional beliefs towards NNJ.

Maternal practices and traditional beliefs towards NNJ.	No	%
Feeding;		
Exclusive breast feeding	209	69.7
Exclusive formula feeding	36	12.0
Mixed breast and formula feeding	55	18.3
Beliefs on sunray effect or fluorescent light is beneficial	243	81.0
Glucose water	183	61.0
Put yellow beads and garlic in neonate clothes	183	61.0

Regarding the association between maternal socio-demographic characteristics and perception of neonatal jaundice (NNJ), maternal occupation was the only variable significantly associated with perception level ($p=0.050$). All mothers with poor perception were housewives, whereas working mothers constituted a higher proportion of those with good perception. No statistically significant associations were observed

between maternal perception and age, residence, or educational level ($p=0.950$, $p=0.080$, and $p=0.160$, respectively). Although 28.9% of mothers with good perception were aged ≥ 35 years, the association between age and perception was not statistically significant. Similarly, 33.7% of mothers with good perception lived in urban areas, but the association with residence did not reach statistical significance. Furthermore, 38.9% of

mothers with good perception had attained a college education or higher; however, educational level was not

significantly associated with perception toward NNJ. These findings are presented in Table 4.

Table 4: Association between maternal perception and socio-demographic characteristics of mothers included in the study.

		Perception score (Q=14)						P value
		Poor		Acceptable/Fair		Good		
		No	%	No	%	No	%	
Maternal age	<19	3	8.3	22	61.1	11	30.6	0.950
	19-34	20	8.8	136	60.2	70	31.0	
	≥35	2	5.3	25	65.8	11	28.9	
Residence	Urban	12	6.1	118	60.2	66	33.7	0.080
	Worker	-	-	18	54.5	15	45.5	
Occupation	Housewife	25	9.4	165	61.8	77	28.8	0.050*
	Read & write	7	7.8	61	67.8	22	24.4	
Education level	Illiterate	4	20.0	11	55.0	5	25.0	0.160
	Intermediate	5	12.2	22	53.7	14	34.1	
	Primary	5	10.0	34	68.0	11	22.0	
	College & Higher	3	3.7	45	55.6	33	40.7	
	Secondary	1	5.6	10	55.6	7	38.9	

*Significant association using Pearson Chi-square test at 0.05 level.

There is significant association between mothers who had informed about NNJ and their perception toward NNJ (P=0.013). No significant association between

perception toward NNJ and mothers who had children with previous NNJ (P=0.222) (Table 5).

Table 5: Variable Associated With Maternal Perception Score Related to NNJ.

Perception score (Q=14)								P value
		Poor		Acceptable/Fair		Good		
		No	%	No	%	No	%	
Mothers who had informed about NNJ	Yes	7	12.3	25	43.9	25	43.9	0.013*
	No	18	7.4	158	65.0	67	27.6	
Had children with previous neonatal jaundice	Yes	9	5.8	96	61.5	51	32.7	0.222
	No	16	11.1	87	60.4	41	28.5	

*Significant association using Pearson Chi-square test at 0.05 level.

Regarding the association between maternal perception of neonatal jaundice (NNJ) and maternal practices and traditional beliefs, no statistically significant associations were identified. Feeding practice was not significantly associated with the level of maternal perception (p=0.052), although the result approached the conventional level of statistical significance (Table 6). Regarding the perceived beneficial effect of sunlight or fluorescent light in the management of NNJ, 36.8% of mothers with good perception reported that these measures had no beneficial effect on the neonate. However, the association between maternal perception and this belief was not statistically significant (p=0.524). Similarly, 35.0% of mothers with good perception did not use glucose water for the management of NNJ, compared with 7.7% of mothers with poor perception. Nevertheless, no statistically significant association was observed between perception level and the use of glucose water (p=0.421). Regarding traditional practices involving garlic and yellow beads, 34.2% of mothers with good perception did not believe in placing these items on the newborn's clothes, compared with 8.5% of

mothers with poor perception. This difference was also not statistically significant (p=0.542). Overall, maternal perception of NNJ was not significantly associated with the assessed feeding practices or traditional beliefs (Table 6).

Table 6: Association of maternal practices and traditional beliefs with perception score.

		Perception score (Q=14)						P value
		Poor		Acceptable/Fair		Good		
		No	%	No	%	No	%	
Feeding	Exclusive breast	23	11.0	118	56.5	68	32.5	0.052
	Exclusive formula	-	-	26	72.2	10	27.8	
	Mixed	2	3.6	39	70.9	14	25.5	
Beliefs on sunray effect	Beneficial	21	8.6	151	62.1	71	29.2	0.524
or fluorescent light	Not	4	7.0	32	56.1	21	36.8	
Glucose water	Yes	16	8.7	116	63.4	51	27.9	0.421
	No	9	7.7	67	57.3	41	35.0	
Put yellow beads and	Yes	15	8.2	116	63.4	52	28.4	0.542
garlic in neonate clothes	No	10	8.5	67	57.3	40	34.2	

*Significant association using Pearson Chi-square test at 0.05 level.

DISCUSSION

Severe neonatal hyperbilirubinemia remains an important but largely preventable health problem, particularly in low- and middle-income countries (LMICs).^[17] Adequate maternal knowledge, early recognition of neonatal jaundice (NNJ), and timely healthcare-seeking behavior are therefore essential for preventing serious complications.^[18] In the present study, 61.0% of mothers had an acceptable/fair level of perception regarding NNJ, while 30.8% demonstrated good perception. Although these findings indicate a generally reasonable level of awareness, important knowledge gaps concerning the causes, clinical manifestations, complications, and appropriate management of NNJ remained. The findings suggest an improvement compared with an earlier Iraqi study conducted in 2006, in which 59% of mothers had poor knowledge.^[19] Traditional practices remained common among the mothers studied. Many mothers reported using sunlight or fluorescent light, glucose water, garlic, or yellow beads for the management of NNJ. Similar reliance on traditional or potentially inappropriate practices has been documented in Iraq^[19], Nigeria^[20], Turkey^[21], and Vietnam.^[22] Such practices may reflect deeply rooted cultural beliefs and inadequate maternal health education.^[23] More importantly, reliance on traditional remedies may delay appropriate healthcare seeking and consequently increase the risk of severe hyperbilirubinemia and its complications.^[24] Most maternal socio-demographic characteristics were not significantly associated with perception of NNJ. Maternal age showed no significant association, consistent with findings from Egypt^[25], Nigeria.^[26] Residence was also not significantly associated with perception, differing from studies conducted in Egypt^[25] and Sri Lanka.^[27] Differences between studies may reflect variations in access to healthcare, health education, socioeconomic conditions, and characteristics of the populations studied. Maternal occupation was the only socio-demographic characteristic significantly associated with perception ($p=0.050$), with working mothers demonstrating better perception than housewives. This finding is consistent with studies from Iraq^[18], Egypt^[25], and Ethiopia.^[24] Employment may increase social interaction, exposure to health

information, autonomy, and access to healthcare resources. In contrast, educational level was not significantly associated with perception in the present study. This differs from previous findings in Iraq^[18], Turkey^[21], Nigeria^[20], Egypt^[25], Iran^[23], and Sri Lanka^[27], where higher maternal education was associated with better knowledge. This discrepancy may suggest that formal education alone does not necessarily protect mothers from inaccurate information or culturally inherited beliefs. Previous exposure to information about NNJ was significantly associated with better maternal perception, emphasizing the potential value of health education. This finding differed from the Nigerian study by Bello et al.^[26] Nevertheless, access to reliable information through healthcare professionals and mass media may improve maternal recognition and understanding of NNJ. Finally, maternal perception was not significantly associated with feeding practices or the assessed traditional beliefs. This contrasts with studies from Iraq^[18], Iran^[23], and Nigeria^[26], which reported relationships between maternal knowledge and practices. These findings suggest that improving knowledge alone may not be sufficient to modify culturally established practices; educational interventions should therefore specifically address misconceptions and harmful traditional beliefs.

Limitations

The study was limited by convenience sampling and the relatively restricted recruitment period. Mothers attended the participating PHCCs mainly on designated vaccination days, reducing opportunities for recruitment. Delays in obtaining administrative approval further shortened the data-collection period. These factors may limit the generalizability of the findings.

CONCLUSION

Most mothers demonstrated acceptable or good perception of neonatal jaundice, while only a minority had poor perception. Working status and previous information about neonatal jaundice were significantly associated with better perception. However, maternal perception was not significantly associated with feeding

practices or traditional beliefs, highlighting the need for targeted maternal health education.

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