DETERMINATION OF MOTHERS' INFORMATION AND ATTITUDE REGARDING NEONATAL JAUNDICE MANAGEMENT IN RAPARIN ADMINISTRATION

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Submitted: 20/9/2022; Accepted: 20/2/2023; Published: 21/9/2023

ABSTRACT

Background

Neonatal jaundice is a widespread disorder that affects newborns more frequently than any other condition. Newborn morbidity and mortality are the possible consequences of inappropriate treatment and a delay in the diagnosis of neonatal jaundice. Consequently, awareness and health-seeking activities of mothers are critical in determining the fate of this hazard.

Objectives

To determine the level of information and attitude of mothers in the Raparin Administration toward neonatal jaundice management

Materials and Methods

A Cross-sectional study was conducted in Raparin Administration Teaching Hospitals for Maternity and Children. A non-probability / convenient sampling technique was used for the selection of 208 mothers who have a neonate with jaundice. The data were collected through structured interviews with mothers, using a specially designed questionnaire, from May 2022 to July 2022. A Statistical Package for Social Sciences (SPSS v.27) was used for statistical analysis.

Results

The results of the study show that the majority of mothers were in the age group 25-33 years, the percentage of those mothers who have graduated from universities was 26.9% and 78.4% of them were living in urban areas, followed by 90.4% of mothers were unemployed and 71.6% have delivered their babies through cesarean section. 61.5% of the neonate's study sample were male. The percentage of neonates' blood group O+ is 39.4%. about (54.3) had been fed their babies through breastfeeding. Another major finding revealed that 57.2% of mothers had good information followed by 48.1% of them also had a good attitude regarding neonatal jaundice management. The mean scores of mothers' information and attitude are 2.45 and 2.34 respectively both mean scores are in the good area on their spectrum, also revealing that there are significant relationships between mothers' information and their demographic features (level of education and mother occupation) at p-value < 0.02 and < 0.01 respectively.

Conclusion

Mothers had good information and attitudes regarding neonatal jaundice management. Mothers' information significantly relates to their occupation and level of education. And also, a non-significantly relationship with their age, and residential places. Mothers' attitudes significantly relationships with their age, educational level, residency, and mothers' occupation. It is recommended that mothers should be given further health education during antenatal visits regarding neonatal jaundice management to improve their information and attitudes.

Keywords: *Neonatal jaundice, information and knowledge, Attitude, Raparin/Sulaymaniyah.*

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https://doi.org/10.17656/jsmc.10424

INTRODUCTION

Neonatal jaundice (NNJ) is the yellowish discolouration of a newborn's skin and sclera due to pathological hyperbilirubinemia, also often reflected as a normal physiological phenomenon. Worldwide, newborn jaundice occurs in 60% and 80% of full and preterm neonates respectively, the majority of which resolves without any treatment. However, in about 8-10% of newborns, neonatal jaundice can be severe. A bilirubin level of more than 85 mmol/l (5 mg/dl) manifests neonatal jaundice. Physiological jaundice occurs on the 2nd and 3rd day of life, due to the breakdown of fetal hemoglobin and the inability of the immature hepatic metabolic pathway to adequately excrete bilirubin [(1)]. Therefore, the risk of Jaundice and other issues stemming from hyperbilirubinemia is most significant in the very early days of the baby's delivery.

Only 10% of breastfed infants continue to have Jaundice for up to one month. Jaundice is discussed as the main cause of admission to neonatal facilities for newborns in England [(2)]. The most prevalent reason for neonates to be readmitted to the hospital while still in their neonatal stage is jaundice in the newborn. It is involved in 70% and 10% of newborn morbidity and mortality over the world, respectively [(3)].

In most cases occurrence is physiological; however, if bilirubin levels increase to threatening levels, it can cause damage and impairments such as cerebral palsy, deafness, mental retardation, or significant developmental delays, particularly in developing nations. It may also end in a newborn's death. Such severe consequences may have been brought on by a bilirubin deposit in the brain's tissue. Therefore, NNJ should be carefully assessed and inhibited from progressing [(4)]. In addition, babies diagnosed with severe neonatal jaundice are at higher levels of death and a lifetime of incapacity risk. Since jaundice might result in difficulties, linked risk factors in babies must be considered as Kernicterus [(5)]. Although most jaundice in term babies is harmless and disappears within 7 to 10 days, nevertheless, 8 and 9 % of all babies might develop severe hyperbilirubinemia within the first week of life. Due to the possibility of bilirubin toxicity, all newborns need to be evaluated to determine the risk for severe hyperbilirubinemia and, in rare cases, bilirubin encephalopathy or Kernicterus [(6)].

Mother's reaction when they identify Jaundice in their newborns depends on the mothers' knowledge about what Jaundice is and the inherent risk that it poses for developing complications if it is not treated effectively. However, mothers and family members may not be able to identify NNJ as quickly at home as they can in hospitals. The mothers' awareness, as well as attitudes towards NNJ, have an impact on both their decision to seek care at the household level and their subsequent delay in seeking assistance at a facility [(7)]. Mothers need to be adequately educated on how to care for an infected newborn, as well as how to recognize the early warning signs of potential difficulties [(8)].

Information on how mothers deal with neonatal Jaundice and their awareness of this subject is scarce. Thus, determining mothers' level of knowledge and understanding regarding neonatal jaundice is important to prevent future infants from getting Jaundice for early detection and therapy [(9)]. Lack of enough information or misinformation and attitudes passed over the years to mothers may explain the delay in seeking medical advice immediately [(10)].

A key factor in managing infected newborns is parents' information regarding jaundice, and it also may affect preventing undesired outcomes and complications. Consequently, a mother's awareness and attitude related to the management of neonatal jaundice may lead to desired clinical outcomes, newborns earlier discharging from hospitals for example. This means that the significant duty for early detection of Jaundice and obtaining suitable treatment at the right site depends on parents. Thus, parents must have access to the appropriate information about how to identify Jaundice in newborns and how to respond to the condition effectively [(11)]. A study from Soran City regarding the assessment of knowledge of neonatal jaundice among mothers attending maternal and pediatric hospitals in Soran City reported that most of the mothers (88%) had poor knowledge regarding neonatal jaundice [(12)]. and also, another study from Karbala about the knowledge and attitudes of mothers towards neonatal jaundice in Karbala Teaching Hospital for Children reported that the mothers' overall knowledge and attitudes were good toward NNJ [(13)] This study aimed to understand the critical role of mothers in neonate life. Thus, assessing information and attitudes of parents towards recognition, causes, complications, treatment, and NNJ prevention, may contribute to delayed presentation and ineffective treatment of severe hyperbilirubinemia.

MATERIALS AND METHODS

A cross-sectional design was implemented to conduct the study. A total of 208 mothers were interviewed as the study sample, those were recruited from: 1. Maternal and Pediatric Teaching hospital in Rania City (58 mothers), 2. Shahidan Kaladze Teaching Hospital (47 mothers), 3. Kewarrash Primary Health Care Center in Rania City (65 mothers), 4. Chwarqwrrna Primary Health Care Center (38 mothers).

During the period from 15 May to July 2022, those mothers who are in their babies with less than one month in governmental hospitals in Rania administration were taken.

Sampling technique

A non-probability (purposive) sample/convenience sampling technique has been used to select study samples.

Tools of the study

A questionnaire was developed and designed to meet the objectives of the study based on a literature review, which consists of three sections. The first section is about the sociodemographic features of the participants. The second part is designed to evaluate the level of information of mothers and consists of 14 items, and the third section is about the attitude of mothers related to neonatal jaundice management which contains 7 items. The verbal agreements for the participation in the study were obtained and the interview was carried out individually.

Data analysis

Collected data from the respondents was inserted into an Excel sheet, and after cleaning the missed data, it was coded and inserted into the Statistical Packages for Social Science (SPSS v.27). Descriptive and inferential statistics for the sociodemographic features and questionnaires were obtained at 95% confidence interval with a p-value ≤ 0.05.

Administration and Ethical Consideration

Ethical approval was achieved from the scientific committee and the ethical committee of the College of Nursing / University of Raparin based on Decree Number (7/29/145) dated (29/3/2022). The researcher followed all the ethical codes of standards during and after the research, including participants' privacy and getting permission from mothers to participate or refuse and the confidentiality of the collected data.

RESULTS

Table (1) presents that the total number of included mothers was (208). The highest percentage 39.4% of mothers were within the age group 25-33 years old. According to findings, the majority of mothers (78.4%) lived in urban places. In addition, regarding occupation almost (90.4%) were unemployed. Respectively, the educational background data reveals that (26.9%) of the mothers graduated from university. Also, in terms of delivery modes, the highest percentage (71.6%) delivered babies through cesarean section. In addition, the distribution of the participants based on birth order in the family indicates that (75.9%) were from (1-3rd) birth order. Finally, from this point of view, we also note that the majority of mothers (35.1%) had an O+ blood group.

Table (2) shows neonate's gender distribution, the findings indicate that (61.5%) were male. In addition, the findings demonstrate that (54.3%) of the neonates were breastfed. Respectively, the distribution of neonate blood groups shows that (39.4%) had O+ blood groups. Also, in terms of the birth weight of neonates, the study indicates that the highest percentage (80.3%) of newborns was between (1kg to 3kg). Moreover, regarding the newborn's first TSB level, the results demonstrate the highest percentage (47.6%) in the level of (11 mg/dl-14.90mg/dl). Finally, about the time of first feeding after delivery, the study samples showed that (93.3%) of newborns were fed in a period of (1 hour -7 hours) after delivery. Table (3) shows almost (82.7%) of mothers know that Jaundice is characterized by a yellow discolouration of the skin and sclera. Followed by (81.7%) mothers know that jaundice is a common problem in neonates.

About (25%) of mothers did not know that having jaundice for more than two weeks in a neonate is abnormal. Also, (40.4 %) of mothers are uncertain that in the first 24 hours if jaundice appears in neonates is abnormal. About (47.1%) of the study sample knows that Preterm labour increases the risk of neonatal jaundice. And more than a third (79.8%) of mothers knew that phototherapy is one of the treatments for neonatal jaundice. However, more than half (54.8%) of mothers did not know that infections increase the risk of neonatal jaundice.

Also, (45.2%) of study samples know that severe jaundice may lead to death in neonates. And (43.6%) of mothers did not know that severe jaundice may lead to brain damage in neonates. Around half (46.6%) study samples did not know that severe jaundice may lead to hearing loss in neonates. And less than half (34.6%) of mothers are uncertain that Sun exposure increases the risk of dehydration and worsens the condition in a jaundiced infant. Also, (57.2%) of mothers did not know that Maternal and fetal blood group differences lead to jaundice. while (84.5%) of mothers knew that a Jaundiced infant may need to have several blood tests by medical personnel. Finally, more than half (62.5%) of mothers know that management of severe jaundice involves blood transfusion.

Table (4) shows that the majority of mothers' responses to information about neonatal jaundice management were good, more than half of the study samples (57.2%) of mothers had I know responses about information regarding neonatal jaundice management.

Table (5) presents almost (95.7%) of mothers who are worried about their infant developing jaundice. The majority of participants (67.8%) mothers agreed that they were worried about several blood tests of their baby because it can cause anaemia. However, nearly three-quarters (71.2%) of mothers disagreed with using traditional treatment when jaundice developed in their babies because this disease is not dangerous. while (78.4%) of mothers agreed that early referring to a physician and getting proper treatment because neonatal jaundice is curable. However more than three-quarters (85.6%) of mothers disagreed that she wanted to consult a physician for my jaundiced baby since I am afraid of hospitalizing my baby. Also, nearly one quarter (24.9%) of mothers had a neutral attitude that exposure of the baby to early morning sunlight is a way of treating jaundice. And finally, almost (96.6%) of mothers agreed that Breastfeeding is a means of treating their baby's jaundice.

Table (6) demonstrates the mother's attitude regarding neonatal jaundice. The majority of them (48.1%) had a good attitude regarding neonatal jaundice management, and about (38.5%) of mothers had an average attitude regarding neonatal jaundice management, which means scores M.S. were 2.34 ± 0.87 which indicates a good attitude.

Table(7)indicatesthattherewasnosignificantrelationship between the mother's information and their age and place of residence at p-value > 0.05. while a significant relationship is reported in mothers' occupations and mothers' level of education at p-value < 0.05. Table (8) explains that there was no significant relationship between the mother's attitudes and their (age, place of residence, occupation and level of education) because p-value > 0.05.

Table 1. Distribution of Mothers by their Socio-Demographic Features.

No.	Features	Variables	F	%
1	**Mother's age (years)**	16-24	64	30.77
		25-33	82	39.42
		34-43	62	29.81
		Mean = 29.177 SD± 6.053 Minimum = 16 maximum = 43		
2	**Place of residence**	Urban	163	78.4
		Rural	45	21.6
3	**Occupation**	Employed	20	9.6
		Unemployed	188	90.4
4	**Educational level**	No schooling	35	16.8
		Primary education	35	16.8
		Intermediate education	40	19.2
		High school education	42	20.2
		University graduation	56	26.9
5	**Delivery mode**	Natural vaginal delivery NVD	59	28.4
		Caesarean section CS	149	71.6

Table 1. Continued.

6	**Birth order in the family**	1st – 3rd	158	75.96
		4th -5th	39	18.75
		6th- 7th	11	5.29
		Mean = 2.5 SD± 1.47		
		Minimum = 1 maximum = 7		
7	**Religions**	Muslim	208	100.00
		Other religions	0	0.00
8	**Gestational age**	Pre-term	48	23.1
		Term	153	73.6
		Post-term	7	3.4
9	**Mothers blood group**	A+	60	28.9
		B+	39	18.8
		AB+	14	6.7
		O+	73	35.1
		A-	8	3.9
		B-	5	2.4
		AB-	0	0.00
		O-	9	4.3

No: Number, F: Frequency, % Percentage M.S.= Mean of Score S. D= Standard Deviation.

Table 2. Distribution of Neonates by their Socio-Demographic Features.

No.	Features	Variables	F	%
1	**Newborn Gender**	Male	128	61.54
		Female	80	38.46
2	**Feedings type**	Breast-feeding	113	54.33
		Formula-feeding	9	4.33
		Mixed-feeding	86	41.35
3	**Newborn Blood Group**	A+	59	28.37
		B+	41	19.71
		AB+	13	6.25
		O+	82	39.42
		A-	2	0.96
		B-	3	1.44
		AB-	2	0.96
		O-	6	2.88
4	**Birth weight**	1kg-3kg	167	80.29
		4kg-5kg	41	19.71
		Mean = 3.086 SD± 0.63		
		Minimum = 1 maximum = 6		

Table 2. Continued.

5	**First TSB level**	6mg/dl – 10.90 mg/dl	96	46.15
		11 mg/dl – 14.90 mg/dl	99	47.60
		15 mg/dl – 18 mg/dl	13	6.25
		Mean = 11.18 SD± 2.26		
		Minimum = 6.80 mg/dl maximum = 18 mg/dl		
6	**Time of first feeding after delivery**	1hour – 7hour	194	93.27
		8hour – 15hour	3	1.44
		16hour – 72hour	11	5.29
		Mean = 3.99 SD± 8.6		
		Minimum = 1hour maximum = 72hour		

No: Number, F: Frequency, % Percentage M.S.= Mean of Score S. D= Standard Deviation

Table 3. Assessment of maternal information regarding neonatal jaundice management variables.

No.	Items	No. (%)			Mean
		I know	Uncertain	I don't know	
1	**Jaundice is the yellowish discoloration of the skin and sclera of newborns**	172(82.7)	6 (2.9)	30(14.4)	2.68
2	**Jaundice is a common problem in neonate**	170(81.7)	13(6.3)	25 (12)	2.69
3	**Jaundice for more than two weeks in a neonate is abnormal**	81(38.9)	75(36.1)	52(25)	2.13
4	**Jaundice appears in the first 24 hours is abnormal**	65(31.3)	84(40.4)	59(28.3)	2.02
5	**Pre-term labour increases the risk of neonatal jaundice.**	98(47.1)	31(14.9)	79(38)	2.09
6	**Phototherapy is one of the treatments for neonatal jaundice**	166(79.8)	11(5.2)	31(15)	2.65
7	**Infection increases the risk of neonatal jaundice**	23(11.1)	71(34.1)	114(54.8)	1.56
8	**Severe jaundice can result in death**	94(45.2)	31(14.9)	83(39.9)	2.05
9	**Severe jaundice can result in brain damage**	84(40.4)	34(16.3)	90(43.3)	1.97
10	**Severe jaundice can result in hearing loss**	67(32.2)	44(21.2)	97(46.6)	1.85
11	**Sun exposure increases the risk of dehydration and worsens the condition in a jaundiced infant.**	24(11.5)	72(34.6)	112(53.9)	1.57
12	**Maternal and fetal blood group differences lead to jaundice**	60 (28.9)	29(13.9)	119(57.2)	1.76
13	**The jaundiced infant may need to have several blood tests by medical personal**	175 (84.5)	7(3.4)	25(12.1)	2.71
14	**Management of severe jaundice is exchanged through blood transfusion**	130(62.5)	11(5.3)	67(32.2)	2.30

No: Number, F: Frequency, % Percentage M.S.= Mean of Score

Table 5. Assessment of maternal Attitudes regarding neonatal jaundice management variables.

No.	Items	Frequency and (%)			Mean
		Agree	Neutral	Disagree	
1	I'm worried about my infant developing jaundice.	199 (95.7)	8 (3.8)	1 (0.5)	2.95
2	I'm worried about my baby's several blood tests because they may result in anaemia.	141 (67.8)	56(26.9)	11 (5.3)	1.37
3	I will use traditional treatment when jaundice develops in my baby because this disease is not dangerous	30(14.4)	30(14.4)	148(71.2)	2.56
4	It is important to consult a doctor as soon as possible. Because neonatal jaundice is curable	163(78.4)	35(16.8)	10(4.8)	2.73
5	I want to consult a physician about my jaundiced baby since I am afraid of putting my baby in the hospital	7(3.4)	23(11)	178(85.6)	2.83
6	Expose of baby to early morning sunlight is a way of treating jaundice	98(47.1)	51(24.5)	59(28.4)	1.81
7	Breastfeeding is a means of treating my baby's jaundice	201(96.6)	3(1.4)	4(2)	2.94

No: Number, F: Frequency, % Percentage M.S.= Mean of Score

Table 6. The Overall Mothers' attitudes regarding Neonatal Jaundice management.

Items	No. (%)			Mean ±SD
	Agree	Neutral	Disagree	
Mothers' attitudes regarding neonatal jaundice management	100 (48.1)	80 (38.5)	28 (13.4)	2.34 ±0.87

% = Percentage, F = Frequency, M.S. = Mean of Score ``disagree (bad) (mean of score 1-1.66), neutral (average) (mean of score 1.67-2.33), agree (good)" (mean of score 2.34 and more). S. D. stands for Standard Deviation.

Table 7. Relationships Between Mothers' Information with some socio- Demographic Features.

Demographic feature	Variables	Mothers' information Regard NNJ Management NO. (%)				X2	d.f	p-value
		I Know	Uncertain	I don't know	Total			
Mothers' age (years)	16 to 25	30 14.42	24 11.54	10 4.81	64 30.77	5.8355	4	0.2 N. S
	26 to 33	50 24.04	26 12.50	6 2.88	82 39.42			
	34 to 43	39 18.75	15 7.21	8 3.85	62 29.81			
	Total	119 57.21	65 31.25	24 11.54	208 100.00			
Place of Residence	Urban	94 45.19	53 25.48	16 7.69	163 78.37	2.3509	2	0.3 N. S
	Rural	25 12.02	12 5.77	8 3.85	45 21.63			
	Total	119 57.21	65 31.25	24 11.54	208 100.00			
Mothers' occupation	Employed	19 9.13	3 1.44	0 0.00	22 10.58	8.9356	2	0.01 S
	Unemployed	100 48.08	62 29.81	24 11.54	186 89.42			
	Total	119 57.21	65 31.25	24 11.54	208 100.00			

Table 7. Continued.

Mother's level of education	No Schooling	18 8.65	12 5.77	5 2.40	35 16.83	18.1255	8	**0.02 S**
	Primary Education	18 8.65	12 5.77	5 2.40	35 16.83			
	Intermediate Education	18 8.65	15 7.21	7 3.37	40 19.23			
	High School Education	20 9.62	17 8.17	5 2.40	42 20.19			
	University Graduate	45 21.63	9 4.33	2 0.96	56 26.92			
	Total	119 57.21	65 31.25	24 11.54	208 100.00			

d.f.= Degree of freedom, X^2 = Chi-square, P-value= Probability value, S= Significant, N. S= No Significant

Table 8. Relationships between Mothers' attitudes with some Socio-Demographic features.

Demographic feature	**Variables**	**Mothers' Attitudes Regard NNJ Management NO. (%)**				X^2	**d.f**	**p-value**
		Disagree	**Neutral**	**Agree**	**Total**			
Mothers' age (years)	16 to 25	10 4.81	18 8.65	36 17.31	64 30.77	5.2279	4	**0.264 N. S**
	26 to 33	12 5.77	33 15.87	37 17.79	82 39.42			
	34 to 43	6 2.88	29 13.94	27 12.98	62 29.81			
	Total	28 13.46	80 38.46	100 48.08	208 100.00			
Place of Residence	Urban	21 10.10	59 28.37	83 39.90	163 78.37	2.4591	2	**0.292 N. S**
	Rural	7 3.37	21 10.10	17 8.17	45 21.63			
	Total	28 13.46	80 38.46	100 48.08	208 100.00			
Mothers' occupation	Employed	4 1.92	6 2.88	12 5.77	22 10.58	1.4221	2	**0.491 N. S**
	Unemployed	24 11.54	74 35.58	88 42.31	186 89.42			
	Total	28 13.46	80 38.46	100 48.08	208 100.00			
Mother's level of education	No Schooling	2 0.96	15 7.21	18 8.65	35 16.83	7.2520	8	**0.509 N. S**
	Primary Education	3 1.44	18 8.65	14 6.73	35 16.83			
	Intermediate Education	6 2.88	15 7.21	19 9.13	40 19.23			
	High School Education	7 3.37	12 5.77	23 11.06	42 20.19			
	University Graduate	10 4.81	20 9.62	26 12.50	56 26.92			
	Total	28 13.46	80 38.46	00 48.08	208 100.00			

d.f.= Degree of freedom, X^2 = Chi-square, P-value= Probability value, S= Significant, N. S= No Significant

DISCUSSION

This study, in which the sample size was (208), is similar to a study from Ghana wherein almost identical results were obtained with the same sample size (N=202) [14]. The highest percentage (39.42%) of the participants in the age group was 25-33 years old, followed by 30.77% in the age group 16-24 years and 29.8% in the age group 34-43 years and the distribution of the study samples mean age of the mother was 29.27 ± 6.053 years and also the minimum age of the study samples is 16 years and maximum age is 43 years. These findings included a study of [15] from Nigeria investigated 30% of the study samples within the age group 26-30 years old,

Regarding residency, the study findings demonstrate that the majority of mothers (78.4%) live in urban places, followed by a small percentage 21.6% living in rural places. These findings are consistent with the findings of the study by [16] from Karbala about mothers' knowledge and beliefs regarding neonatal jaundice care in holy Karbala city were assessed, and the majority of the mothers (65%) live in urban places.

In addition, regarding mothers' occupations, almost all of the participants (90.4%) were unemployed, followed by a small percentage of the study sample 9.6% who were employed. This finding resembles a study that looked at postnatal mothers' knowledge and attitudes about neonatal jaundice at Motahari Hospital in Iran. According to their findings, the majority of mothers (79.5%) were unemployed housewives [17].

Concerning the educational level of mothers, the findings show that (26.9%) of the mothers were university graduates, followed by 20.2% who were from high school, 19.2% with intermediate school level, and 16.8% were illiterate, i.e., means that they received no schooling, while 16.8% were in primary school level. This finding disagrees with the findings of a descriptive study to assess non-medical treatment of neonatal jaundice in Qadisieh, which found that (83%) of mothers were educated up to intermediate school graduate level [18].

In terms of mothers' delivery modes, the greatest percentage (71.6%) were delivered by cesarean section and only 28.4% were delivered by normal vaginal delivery, the results do not support with study findings of a descriptive study to evaluate Kurdish mothers' practices regarding newborn jaundice management which found that (69%) of mothers delivered by normal vaginal NVD and only (31%) delivered by Caesarean section CS [19]. Also, in disagreement with our study, a study from Iraq had shown that the percentage of normal vaginal delivery (NVD) was (58.1%) and (41.9%) for cesarean section [20].

Concerning birth order in the family, three quarters 75.96% from (1-3rd) birth order followed by 18.75% from (4th -5th) birth order and only a percentage of 5.29% from (6th -7th) birth and also the minimum birth of order is 1 and maximum birth of order is 7, This finding is consistent with the study's findings on postnatal mothers' knowledge and attitudes toward neonatal jaundice at Motahari Hospital in Iran, which discovered that 72 (36%) were born first, with the remaining 128 (64%) born second or higher [17].

Regarding the religions of mothers, 100% were Muslims. Regarding the gestational age of mothers, about three-quarters of mothers 73.6% gave birth on term followed by 23.1% were pre-term and only 3.4% were pos-term, this finding agreed with the findings of a study of mothers' traditional practices in caring for neonates affected by hyperbilirubinemia, which discovered that, more than half 63% of babies have a gestational 38 weeks which is indicated in term [21].

Concerning the mother's blood groups, the majority of mothers 35.1% had an O+ blood group followed by 28.9 % having an A+ blood group. This finding is consistent with the findings of a recent study of [9] from Sierra Leone that shows that the majority of mothers 44.5 % had an O+ blood group, and 27% had an A+ blood group.

Concerning the gender of neonates, Research findings demonstrate that more than half of the neonates (61.5%) are male gender and (38.5%) are female gender. This finding is similar to a study by [22], from Iraq who investigated the prevalence and risk factors of neonatal hyperbilirubinemia in Mosul and discovered that 66% were male babies, while 34% were female babies.

Regarding newborn types of feeding, the findings show that more than half of the study samples (54.33%) of the neonate had been fed through breastfeeding (41.35%) of newborns were fed through mixed feeding and only a few percentages (4.33%) of the newborn had been fed through formula feeding, these findings support by the findings of a descriptive study to assess Kurdish mothers' practices regarding newborn jaundice management, which discovered that 53.8% of the neonate had been fed via breast and formula feeding [19].

Concerning the neonate blood groups, the majority of neonates (39.42%) had an O+ blood group and (28.4 %) had an A+ blood group. This finding is nearly similar to the research study of ABO incompatibility and its impact on neonatal hyperbilirubinemia which found that the blood groups O+ and A+ had the highest percentages of study neonates 41.3 and 34.7% respectively [23].

Regarding the birth weight of neonates, the study shows that the highest percentage (80.3%) of the newborn was between (1kg to 3kg) and (19.7%) of newborns which were between (4kg to 5kg) and the mean birth weight of newborn was 3.086 ± 0.63 kilogram, and also, the minimum birth weight is 1kg and maximum birth weight is 5kg. This finding is in agreement with the research findings of the study on mothers' traditional practices in caring for neonates with hyperbilirubinemia, which discovered that 70% of babies were born weighing less than 2 kg [21].

Considering the first TSB level the highest percentage of 47.6% in the level (6 mg/dl – 10.9 mg/dl) and 46.15% in the level (11-14.9 mg/dl) and only the percentage of 6.3% were in the level of (15-18 mg/dl), and the mean of TSB level of the newborn was 11.18 ± 2.26 mg/dl, and also the minimum TSB level is 6.8 mg/dl and maximum TSB level is 18 mg/dl. This finding disagrees with the study findings by [24] which reported that the highest percentage 47% of the study samples relatively have a TSB value ≥ 15 mg/dl.

Moreover, about the time of first feeding after delivery, the majority of the study samples with the highest percentages (93.3%) in the time (1-7 hours) after delivery and the percentage (5.3%) in the time (16-72 hour) after delivery and only (1.4%) in the time (8-15 hour) after delivery. This finding is supported by the study results of (25) which reported that the majority of participants (73.1%) early fed initially after delivery, and the mean feeding time after delivery was 3.99 ± 8.6 hours, also, the minimum time of first feeding after delivery is 1 hour and maximum time of first feeding after delivery are 72 hours.

The majority of mothers' responses about information regarding neonatal jaundice management are good according to mean of scores, (57.2%) of mothers had 'I know' responses about information regarding neonatal jaundice management and (31.3%) of the study samples had 'uncertain response', and only (11.5%) of mothers had 'I don't know' response about information regarding neonatal jaundice management, these findings disagreed with the study of [26] who found that in the study fifty percent of the mothers had poor knowledge and sixteen percent of them had good knowledge about NNJ.

Regarding the mothers' attitude toward neonatal jaundice management, the majority of mothers' responses about mothers' attitudes regarding neonatal jaundice management are good according to the mean of scores, (48.1%) of mothers had (agree) good attitudes regarding neonatal jaundice management and (38.5%) of mothers had (neutral) normal attitude regarding neonatal jaundice management, mean of scores M.S.=2.34 ±0.87 which indicates a good attitude, these findings agreed with the study of [8] who found that in the study 30% of mothers had a good attitude regarding NNJ management.

It was revealed from our study that there were no significant relationships between mothers' age and place of residence with their level of information regarding neonatal jaundice management at a p-value > 0.05. This does not indicate whether younger mothers are more likely to have many sources of information than older women and would more readily bring their children to health facilities than older women. Also, this does not indicate that mothers who live inside the city have better information than mothers who live in villages. This result conflicts with (16) who found a strong significant correlation between the children's mother's knowledge and age, residential area at p-value < 0.05.

Also, our results show that there was a significant relationship between mothers' occupation and level of education with their level of information at p-value < 0.05. This is expected that mothers who have a high level of education and are employed were more likely to have many sources of information than others and the level of information was increased with increasing levels of education and occupation. This finding is similar to [27] who reported that there were significant relationships between occupation and level of education with their knowledge at p-value < 0.05. and also, this finding is similar to the study of (28) who reported that there was a significant relationship between the level of education and mothers' knowledge of neonatal jaundice p= 0.020 at p-value < 0.05

The finding indicated that there were no significant relationships between mothers' age and residential area

with mothers' attitudes regarding neonatal jaundice management P= 0.2647 and P= 0.2924 at p-value > 0.05. This finding agrees with [19] which shows that there were no significant relationships between the age of mothers and resident area with their attitudes at p-value > 0.05. and also, this study is supported by the study of [28] which reported that there was no significant relationship between the age of mothers and the attitude of mothers regarding the management of neonatal jaundice p=0.934 at p-value > 0.05.

The results showed that there is no significant connection between mothers' occupations and their attitudes regarding neonatal jaundice management at P=0.4911 at p-value > 0.05. This result is conducted by [29] which indicates that there are no significant relationships among the attitudes of mothers and mothers' occupations at p-value > 0.05.

The finding indicates that there were no statistically significant relationships between mothers' attitudes and their educational level P= 0.5097 And at p-value > 0.05. This finding disagrees with the study by [30] which reported that there is a significant relationship between mother's attitudes and their educational level at a p-value < 0.05. Also, this finding is conducted by [14] which indicates that there is no significant relationship between the attitude of mothers and educational level at p-value > 0.05.

Finally, in contrast with the finding of this study, a study of [4] reported that there was a statistically significant relationship between mothers' residential area and occupation and level of education with mothers' attitude score at P<0.001.

In conclusion, the mother's information regarding neonatal jaundice management is good because mothers receive information about neonatal jaundice from doctors and nurses and sometimes primary health care centres provide educational programs for mothers about NNJ. In addition, the mothers' attitude regarding neonatal jaundice management is good, because the majority of mothers agreed to admit neonates with jaundice to the hospital and consult a physician, which is a better attitude than using traditional treatments.

Mothers' information significantly relates to their occupation and level of education. And also, a non-significantly relationship with their age, and residential places. Mothers' attitudes significantly relationships with their age, educational level, residency, and mothers' occupation.

The study recommended that during antenatal and postnatal visits, mothers should be routinely further educated. When their newborns develop jaundice, nurses should advise mothers to promote and support successful breastfeeding. It is critical to organize a health education program session for mothers, with a focus on the importance of managing jaundice.

Acknowledgement

We acknowledge all the study participants who agreed and participated in this study, all pediatricians, nurses, and administration staff in all hospitals for their help during this study.

Conflict of Interest

There is no conflict of interest to declare

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