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The assessment of awareness level among the parents regarding the neonatal jaundice in the Arar city, KSA

Irfan Hanif[1], **Sarwar Hussain**[1], **Wael Khulaif J Alanazi**[2], **Faris Athal F Alanazi**[2], **Abdullah Ayidh Q Alanazi**[2], **Ziyad Daham R Alanazi**[2]

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Authors' Affiliation:
[1]Assistant prof. of pediatrics, NBU, Arar, KSA
[2]Undergraduate, Medical students, NBU, Arar, KSA

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ABSTRACT

Background: Raising parental awareness will help the illness progress by enabling early identification, prompt treatment, and appropriate management of new born jaundice. *Objective:* The aim and objectives of the existing research paper was to explore the awareness level of parents about neonatal jaundice (NNJ) knowledge and attitude. *Methods:* A cross sectional survey was conducted in Arar city, Saudi Arabia, by using social media, personal interviews and paper-based questionnaires, during the period from 1 May to 31 July, 2021. *Results:* The study included 385 participants, 69.4% of them were females and 30.6% were males. 55% of study participants had a child or more diagnosed with neonatal jaundice. 49.9% of participants had knowledge of NNJ. Source of knowledge was relatives and friends in 46.2% of participants, and 14.3% from a healthcare provider. 36.4% of participants reported head as the first part of the body affected by neonatal jaundice, 15.6% arms and 2.6% legs. Neonatal jaundice complications included physical handicap, hearing and vision loss, mortality, epilepsy, and delayed development, which were all reported by 10.4%, 14.0%, and 5.2% of participants respectively. 37.4% of participants reported using sunshine as their primary form of treatment for newborn jaundice, followed by home lighting (12.7%), hospital light therapy (5.69%), and blood transfusion (4.9%). *Conclusion:* The inhabitants of Arar Saudi Arabia knew little about the causes, problems, and treatments of newborn jaundice. Efforts to improve generals' knowledge and attitudes are needed to promote good maternal health-seeking behaviour and decrease impairments and infant jaundice-related deaths.

Keywords: jaundice, neonate, parental awareness

1. INTRODUCTION

Neonatal jaundice is defined as yellowish staining of a newborn's skin and sclera due to increased levels of bilirubin (Egube et al., 2013). It happens in around half to 60% and 80% of full-term and preterm newborns

correspondingly. It is a global disorder that represents 75% of medical clinic readmissions in the first seven days of life (Moawad et al., 2016). The main contributors of jaundice in neonates include the immature hepatocytes and catabolism of fetal hemoglobin, which leads to augmented quantities of bilirubin inside the serum (Bilirubin level >5 mg/dl) which result in jaundice symptoms (Dash, 2013). In the nonexistence of some basic etiologies, it usually disappears within 3–5 days without significant complications (Slusher et al., 2017). There are multiple pathological causes of neonatal jaundice include perinatal, neonatal, and genetic factors and also some medications. Insufficient breastfeeding showed an increase in the occurrence of neonatal jaundice (Alfouwais et al., 2018).

In KSA, indirect hyperbilirubinemia represents 15.9% of all neonates, of which the most frequent cause is ABO incompatibility 31.6% followed by G6PD 10.5%, polycythemia, and Rh incompatibility represent 2.6% (Alkhotani et al., 2014). Increased concentration of indirect bilirubin leads to acute and chronic bilirubin encephalopathy or kernicterus which results in permanent brain damage and death. Cerebral palsy, mental retardation, and hearing impairment could be consequences if jaundice is not noticed and managed early (Salia et al., 2021). However, early detection, rapid and suitable management of neonatal jaundice can be achieved by raising the level of awareness among the parents which will improve the outcome of the disease (Amegan-Aho et al., 2019).

Aim

To explore the magnitude of cognizance, awareness and practices among parents regarding neonatal jaundice in Arar City, KSA

Objectives

To evaluate the knowledge among the parents about neonatal jaundice
To assess parental practice and attitude toward neonatal jaundice
To find out whether any association between parents practice and attitude with age, education level and occupation.

2. RESEARCH METHODOLOGY

Materials

Structure questionnaire in Arabic / English
SPSS package (variety 23)

Method

The research project proposal was submitted to the institutional review board of the Northern Border University for the ethical approval and we got the approval with decision letter number (34/43/H). A cross sectional survey was conducted for the enrolment of participants from the Arar city - Saudi Arabia by using social media, personal interviews and paper-based questionnaires, during the period from 1 May to 31 July, 2021. Structure questionnaires in Arabic were distributed among the willing persons. The data was analyzed to evaluate the level of awareness among the parents regarding the neonatal jaundice.

Study Design: Descriptive cross-sectional study
Sample size: 385
Study setting: Arar city, Saudi Arabia
Statistics: The data was analyzed by SPSS package (variety 23).

3. RESULTS

Table 1 illustrates the social and demographic appearance of applicants.The study included 385 participants, 69.4% of them were females and 30.6% were males. 38.2%of participants aged more than 40 years old, 28.1% were between 31- 40 years old and 27.3% were between 20- 30 years old. 41% of participants were teachers, 15.3% were students and 8.3% were working in the health sector. Most participants had collage education or more while 15.1% had secondary degree or lower. 41.8% of participants had >4 children, 33.2% had 2- 4 children and 24.9% had one child.

Table 1 Social and demographic appearance of applicants (n=385)

Parameter		No.	Percent
Gender	Male	118	30.6

	Female	267	69.4
Age	Less than 20	25	6.5
	20 - 30 years old	105	27.3
	31 - 40 years old	108	28.1
	More than 40	147	38.2
Occupation	Student	59	15.3
	Soldier	24	6.2
	Teacher	158	41.0
	in the health sector	32	8.3
	Other	112	29.1
Education level	Secondary or lower	58	15.1
	College or above	327	84.9
Number of children	1	96	24.9
	2-4	128	33.2
	More than 4	161	41.8

Figure 1 show that 55% of the study participants had a child or more are diagnosed with neonatal jaundice. Table 2 shows that 49.9% of participants had knowledge of NNJ. Source of knowledge was cited as relatives and friends in 46.2% of participants, 14.3% from a healthcare provider, 13% from social networks and 8.8% from paediatric doctor. Regarding definition of NJ, 85.7% of participants defined it as yellowing of the eyes and skin and only 1.6% defined it as change in colour of stool and urine. 36.4% of participants defined head as the first part of the body affected by neonatal jaundice, 15.6% arms and 2.6% legs. 13.5% of participants identified premature birth as a main cause of neonatal jaundice, 8.1% reported breastfeeding, 20.8% reported blood type incompatibility between mother and fetus, 19.5% reported blood diseases, 14.8% reported infection and 7.8% reported congenital hypothyroidism. Complications of neonatal jaundice were reported as physical disability by 10.4% of participants, hearing and vision loss by 14%, death by 7%, epilepsy by 5.2% and delayed growth by 21%. Treatment for neonatal jaundice was reported to be sunlight by 37.4% of participants, home light by 12.7%, and light therapy in the hospital by 56.9% and blood exchange by 4.9%.

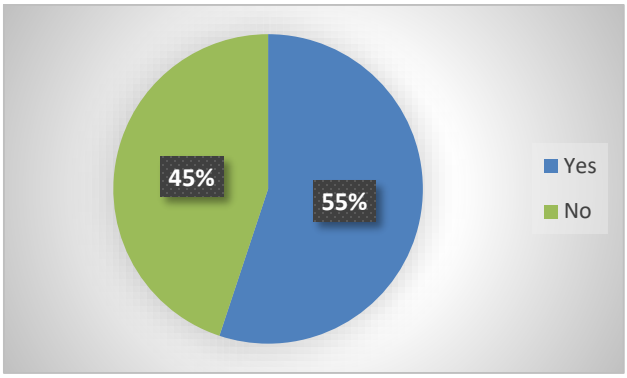

Figure 1 incidence of NNJ among the studied children, Arar, KSA

Table 2 Knowledge of participants of definition, causes, symptoms, complication and treatment of neonatal jaundice (n=385).

Parameter		No.	Percent
Knowledge about neonatal jaundice	Yes	192	49.9
	No	193	50.1
Source of knowledge	Relatives and friends	178	46.2
	Social networks	50	13.0
	Pediatric doctor	34	8.8
	From a health care provider	55	14.3
	I had no source of knowledge	68	17.7
Definition of newborn jaundice	Yellow staining of the eyes and skin	330	85.7
	Change in color of stool and urine	6	1.6

	I do not know	49	12.7
The first part of the body affected by neonatal jaundice	Legs	2.6	10
	Trunk	1.8	7
	Head	36.4	140
	Arms	15.6	60
	Don't know	43.6	168
Causes of neonatal jaundice	Premature birth	52	13.5
	Breastfeeding	31	8.1
	Blood type incompatibility between mother and fetus	80	20.8
	Blood diseases	75	19.5
	Infection	57	14.8
	congenital hypothyroidism	30	7.8
	I do not know	209	54.3
Dangerous signs of neonatal jaundice	Refrain from breastfeeding	111	28.8
	High temperature	104	27.0
	crying out loud	65	16.9
	convulsions	42	10.9
	I do not know	187	48.6
Complications of neonatal jaundice	physical disability	40	10.4
	Hearing and vision loss	54	14.0
	the death	27	7.0
	Epilepsy	20	5.2
	delayed growth	81	21.0
	I do not know	245	63.6
Effective Treatment for neonatal jaundice	Sun light	144	37.4
	home light	49	12.7
	Light therapy in hospital	219	56.9
	blood exchange	19	4.9
	I do not know	74	19.2
Prevention of neonatal jaundice	Healthy eating during pregnancy	73	19.0
	Prior knowledge about newborn yolks	120	31.2
	Prenatal examination and follow-up	158	41.0
	Prevent infection	48	12.5
	I do not know	135	35.1

Table 3 presents the attitude of participants toward neonatal jaundice. Concerning the action if baby had neonatal jaundice; 40% preferred hospital treatment, 29.6% stated exposing the child to the sun and 10.1% don't know how to deal with the situation. Table 4 shows a significant connotation was noted between knowledge of NNJ with gender, and occupation ($P<0.05$).

Table 3 Attitude of participants toward neonatal jaundice (n=385).

Parameter		No.	Percent
Action if baby had neonatal jaundice	Herbal remedy	17	4.4
	Hospital treatment	154	40.0

	Antibiotic treatment	1	.3
	Exposing the child to the sun	114	29.6
	Exposing the child to the radiation of the house	22	5.7
	Breastfeeding increase	19	4.9
	Cauterizations	15	3.9
	Does not need treatment	4	1.0
	I do not know	39	10.1
Cauterization helps	Yes	116	30.1
	No	269	69.9
The best way to educate and stimulate parents' awareness about neonatal jaundice	Through prenatal visits by the doctor	103	26.8
	Through social media	137	35.6
	Setting up an awareness campaign in a public place	145	37.7

Table 4 Relationship concerning the socio-demographic characters of participants with knowledge of NNJ

Parameter		Knowledge about NNJ		Total (N=385)	P value
		Yes	No		
Gender	Male	47	71	118	0.009
		24.5%	36.8%	30.6%	
	Female	145	122	267	
		75.5%	63.2%	69.4%	
Age	Less than 20	11	14	25	0.319
		5.7%	7.3%	6.5%	
	20 - 30 years old	50	55	105	
		26.0%	28.5%	27.3%	
	31 - 40 years old	62	46	108	
		32.3%	23.8%	28.1%	
	More than 40	69	78	147	
		35.9%	40.4%	38.2%	
Occupation	Student	27	32	59	0.031
		14.1%	16.6%	15.3%	
	Soldier	9	15	24	
		4.7%	7.8%	6.2%	
	Teacher	71	87	158	
		37.0%	45.1%	41.0%	
	in the health sector	15	17	32	
		7.8%	8.8%	8.3%	
	Other	70	42	112	
		36.5%	21.8%	29.1%	
Education level	Secondary or lower	29	29	58	0.983
		15.1%	15.0%	15.1%	

	College or above	163	164	327	
		84.9%	85.0%	84.9%	
History of NNJ in one child or more	Yes	114	98	212	0.090
		59.4%	50.8%	55.1%	
	No	78	95	173	
		40.6%	49.2%	44.9%	

4. DISCUSSION

Neonatal jaundice is a serious yet avoidable medical condition. Real controlling of NNJ relies heavily on passable maternal education, timely insight, and care-seeking behaviour. This research paper aims to explore the cognizance and practices among parents regarding neonatal jaundice in Arar City, KSA. In the current study, 55% of participants reported having one child or more with history of NNJ. This was higher than figures reported in Iraq (Thabit, 2019) in which the proportion of mothers with positive previous history of neonatal jaundice 38.8%, while the finding of (Rabiyee et al., 2014) was 23% in Iran and 55.7% in Nigeria (Bello et al., 2014). This research paper stated that the whole mother's information on NNJ was 49.9%. This was higher than reported in Ethiopia as the general mother's info on NNJ was 39.2% (Demis et al., 2021). This figure was steady with a research done in Iraq (34%) (Hussein & Aziz, 2016). Conversely, it was less than the 52.3% found by research done in Egypt, (Moawad et al., 2016) Sagamu, Southwest Nigeria, 57.1%, (Ogunlesi & Abdul, 2015) Baghdad, Iraq, 71% (Thabit, 2019) and Tabriz, Iran, 77% (Amirshaghaghi et al., 2008). On the contrary, it stayed greater than a research steered in Malaysia, 7.4% (Boo et al., 2011) and Nepal 22% (Shrestha et al., 2019).

In Ghana, 8.9% of the caregivers had good knowledge about neonatal jaundice (Salia et al., 2021). Another study in Ghana found that merely 17.3% of moms caught about newborn jaundice (Adoba et al., 2018). This is extremely less than the figure of 96% of moms who were alert about newborn jaundice in a prevalence study steered among hopeful moms in southeast Nigeria (Onyearugha et al., 2016). Other studies in LMICs reported low knowledge as well (Kulkarni et al., 2014; Magfouri et al., 2019; Shrestha et al., 2019; Ng Sy & Chang, 2014). The discrepancies in the sociodemographic features of research contributors and the period interval between the investigations may be the causes of the disparities in the cognizance levels in the various previous researches. The site of jaundice detection as stated by the included mothers was 36.4% head, 15.6% arms and 2.6% legs. A study in Iraq reported that mothers reported 36.2% for skin, 32.1% in eyes, 29.5% in face, 23.8% in palms and feet (Thabit, 2019).

Treatment options as claimed by the mothers in the current study was reported to be sunlight by 37.4% of participants, home light by 12.7%, light therapy in the hospital by 56.9% and blood exchange by 4.9%. This was comparable to previous study reported 63.4%, 37% and 46% for phototherapy, exchange blood transfusion and exposure of the newborn to sun (Thabit, 2019) which are lower than the findings of in selected village of Puducherry 93.9% ,45.5% for phototherapy, exchange blood transfusion(Dash, 2013), while Harrison et al., (1999) revealed that 36% of postpartum mothers. In Badulla (Rodrigo et al., 2011), 44% of mothers were conscious about phototherapy for instance a customary dealing of neonatal jaundice, 14.1% were aware for exchange transfusion as a treatment for jaundice.

A study conducted in Nigeria had also justified phototherapy and exchange transfusion remains the standard treatment of neonatal jaundice (Rodrigo et al., 2011). In Egypt, the actual treatment of NNJ for instance specified by parents stayed typically phototherapy by the side of the hospital in 59.1%, while (28.4%) chose home light. White light (62%) followed by blue light (33.3%) were the most effective type of phototherapy as stated by parents, and (65.9%) of participants believed that sunlight was a beneficial treatment for NNJ (Alfouwais et al., 2018). Complications of neonatal jaundice in our study were reported as physical disability by 10.4% of participants, hearing and vision loss by 14%, death by 7%, epilepsy by 5.2% and delayed growth by 21%.

A study in Iraq reported that 46.4%, 42.2%, 29.4% and 27.2% of participants answered correctly regarding death, brain damage, mental retardation and deafness respectively (Hussein & Aziz, 2016). The findings of a study (Ng Sy & Chang, 2014) in Malaysia 66.2% of mothers stated death, 42.9% deafness, 51.3% mental retardation while the findings of another Malaysian study (Boo et al., 2011) 71.7% and 69.7% of mothers answered that severe jaundice could result in death and brain damage (Ng Sy & Chang, 2014; Boo et al., 2011). A large population of (Rodrigo et al., 2011) in regional general hospital, had stated 5.4% for mental handicap 6.5% for neonatal.

In our study, source of knowledge of NNJ was cited as relatives and friends in 46.2% of participants, 14.3% from a healthcare provider, 13% from social networks and 8.8% from pediatric doctor. In KSA, a study reported that relatives and friends were the main sources of knowledge for (52.6%) of the participants, followed by treating doctor in (29.8%) (Rodrigo et al., 2011). A study in

Iraq reported the main source of information regarding neonatal jaundice was family /relatives 39.7%, followed by health workers 30.6% (Thabit, 2019), while the results of (Bello et al., 2014) mothers in Gwaza local government area of Borno state, Nigeria was family 33.0%, friends 59.4% and medical personnel 5.7%, while the findings of (Rabiyee et al., 2014) revealed that two thirds of participants indicated antenatal clinic as a main source of information. In Ghana, school was cited as the chief basis of data regarding newborn jaundice (34.6%) shadowed by friends (15.4%), then TV was the last origin of information (7.7%) (Adoba et al., 2018). While, Dash (2013) stated that, the majority of the applicants acquired the information from the health care providers (50%) then friends (26%).

Mothers' lack of knowledge round newborn jaundice in addition to its sources puts them at risk of neglecting potentially avoidable risk influences, and more, missing signs which necessitate instantaneous controlling of jaundice in neonates, causing them to develop jaundice and frequently presenting to health services providers after irreparable neurotoxicity in addition to brain harm might happened.

5. CONCLUSION

In conclusion, Arar Saudi population had low information level of newborn jaundice, its causes, complications and treatment will promote good maternal health-seeking behaviour plus decrease impairments in addition, decrease the infant jaundice-related deaths. Additionally, there must be more community cognizance of and edification regarding newborn jaundice, especially amongst private hospitals care providers.

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We thank the participants who were all contributed samples to the study. Author Contributions We certify, as authors, that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor. All persons who have made substantial contributions to the work reported in the manuscript.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

Approval to conduct the research was got from the Research Ethics Committee of the Northern Border University with decision letter number (34/43/H).

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Adoba P, Ephraim RKD, Kontor KA, Bentsil JJ, Adu P, Anderson M, Sakyi SA, Nsiah P. Knowledge Level and Determinants of Neonatal Jaundice: A Cross-Sectional Study in the Effutu Municipality of Ghana. Int J Pediatr 2018; 2018:3901505. doi: 10.1155/2018/3901505.
2. Alfouwais N, Seada L, Alahmadi R, Alassiri A, Alenazi A, Aljuaeed M. Assessment of Knowledge, Attitude and Practice of Saudi Parents towards Neonatal Jaundice (NNJ): A Cross-sectional Study. Egypt J Hosp Med 2018; 70(9): 1686-1694.
3. Alkhotani A, Eldin E, Zaghloul A, Mujahid S. Evaluation of neonatal jaundice in the Makkah region. Sci Rep 2014; 4:4802-4806.
4. Amegan-Aho KH, Segbefia CI, Glover NDO, Ansa GA, Afaa TJ. Neonatal Jaundice: awareness, perception and preventive practices in expectant mothers. Ghana Med J

2019; 53(4):267-272. doi: 10.4314/gmj.v53i4.3. PMID: 32116337; PMCID: PMC7036439.

5. Amirshaghaghi A, Ghabili K, Shoja MM, Kooshavar H. Neonatal jaundice: knowledge and practice of Iranian mothers with icteric newborns. Pak J Biol Sci 2008; 11(6):942-5.
6. Bello M, Yahaya SJ, Mary A, Sa'ad YM, Simon P. Neonatal Jaundice: KAP of mothers in Gwaza local government area of Borno state, North Eastern Nigeria, Int J Health Sci 2014; 1(1):7-12.
7. Boo NY, Gan CY, Gian YW, Lim KS, Lim MW, Krishna-Kumar H. Malaysian mothers' knowledge & practices on care of neonatal jaundice. Med J Malaysia 2011; 66(3):239-243.
8. Dash MA. Descriptive study to assess the knowledge and attitude on neonatal jaundice among the mothers in a selected village of Puducherry. J Med Health Sci 2013; 2:41-46.
9. Demis A, Getie A, Wondmieneh A, Alemnew B, Gedefaw G. Knowledge on neonatal jaundice and its associated factors among mothers in northern Ethiopia: a facility-based cross-sectional study. BMJ Open 2021; 11(3):e044390. doi: 10.1136/bmjopen-2020-044390.
10. Egube BA, Ofili AN, Isara AR, Onakewhor JU. Neonatal jaundice and its management: knowledge, attitude, and practice among expectant mothers attending antenatal clinic at University of Benin Teaching Hospital, Benin City, Nigeria. Niger J Clin Pract 2013; 16(2):188-94.
11. Harrison SL, Buettner PG, Macheanau. Why Do Mothers still sun their infants. Paediatr Child Health 1999; 35(3):296-299.
12. Hussein H, Aziz A. Assessment of mothers' knowledge and beliefs toward care of neonatal jaundice in pediatric teaching hospital in Holy Karbala City. Int J Sci Res 2016; 6(1):585-593.
13. Kulkarni SK, Dolas AL, Doibale MK. Risk factors of neonates with indirect hyperbilirubinemia in a tertiary care hospital. Int j basic appl Med 2014; 4(1):395–9.
14. Magfouri H, Aqeel A, Maashi A, Maghfuri N, Jarad R, Kathiah A, Abdu DA, Almudeer A. Mothers' perception of neonatal jaundice in Jazan Region, KSA. J Clin Neonatol 2019; 8(2):116-121.
15. Moawad EM, Abdallah EA, Ali YZ. Perceptions, practices, and traditional beliefs related to neonatal jaundice among Egyptian mothers: A cross-sectional descriptive study. Medicine (Baltimore) 2016; 95(36):e4804. doi: 10.1097/MD.0000000000004804. PMID: 27603393; PMCID: PMC5023916.
16. Ng Sy, Chang Sy. What do mothers know about neonatal jaundice? Knowledge, attitudes and practices of mothers in Malaysia, Original article. Med J Malaysia 2014; 69(6):252-256.
17. Ogunlesi TA, Abdul AR. Maternal knowledge and care-seeking behaviors for newborn jaundice in Sagamu, Southwest Nigeria. Niger J Clin Pract 2015; 18:33–40.
18. Onyearugha C, Chapp-Jumbo A, George IO. Neonatal jaundice: evaluating the knowledge and practice of expectant mothers in Aba, Nigeria. J Health Sci Res 2016; 1(2):42–47.
19. Rabiyee PS, Gheibi S, Jafari S. knowledge and attitudes of postnatal mothers on neonatal jaundice in Motahar hospital, Iran. J Clin Med Res 2014; 3(1): 1-5.
20. Rodrigo Bk NR, Cooray G. The knowledge, attitudes and behaviors on neonatal jaundice of postnatal mothers in Provincial general hospital, Badulla, Sri Lanka. J Child Health 2011; 40(4):164 -168 .
21. Salia SM, Afaya A, Wuni A, Ayanore MA, Salia E, Kporvi DD, Adatara P, Yakong VN, Eduah-Quansah SA, Quarshie SS, Dey EK, Akolga DA, Alhassan RK. Knowledge, attitudes and practices regarding neonatal jaundice among caregivers in a tertiary health facility in Ghana. PLoS One 2021; 16(6):e0251846. doi: 10.1371/journal.pone.0251846.
22. Shrestha S, Maharjan S, Petrini M. Knowledge about neonatal jaundice among Nepalese mothers. JBPKIHS 2019; 2:34–42. doi:10.3126/jbpkihs.v2i1.24965 Google Scholar
23. Shrestha S, Pertini MA, Shrestha S, Maharjan S. Knowledge about neonatal jaundice among Nepalese mothers. Sri Lanka J Child Heal 2019; 48(3):215–20.
24. Slusher TM, Zamora TG, Appiah D, Stanke JU, Strand MA, Lee BW, Richardson SB, Keating EM, Siddappa AM, Olusanya BO. Burden of severe neonatal jaundice: a systematic review and meta-analysis. BMJ Paediatr Open 2017; 1(1):e000105. doi: 10.1136/bmjpo-2017-000105.
25. Thabit, MF. Knowledge regarding neonatal jaundice among a sample of mothers attending some Primary Health Care centers/Baghdad. DJM 2019; 17(1): 77-84.