ORIGINAL ARTICLE

Knowledge, attitude and practices of registered nurses regarding neonatal jaundice at the neonatal intensive care unit in a tertiary hospital in Khomas region, Namibia

NDAPEWOSHALI NAMBINGA and EMMA MAANO NGHITANWA

School of Nursing and Public Health, University of Namibia, Namibia

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Abstract. Neonatal jaundice is a significant cause of neonatal morbidity worldwide and accounts for 75% of hospital readmissions in the first week of life. New-born babies can develop severe neonatal jaundice that may cause irreversible brain damage or even death. To assess the knowledge, attitude and practices of registered nurses on neonatal jaundice among neonates at Neonatal Intensive Care Unit at Windhoek Central hospital. A quantitative, descriptive, cross sectional research design was used. The population was all 34 registered nurses working at Windhoek Central Hospital neonatal intensive care unit. Census sampling was used to include all 34 registered nurses working in the neonatal intensive care unit of the selected hospital due to the limited small number of the population. Data were collected using a self-developed questionnaires that collected socio-demographic information and knowledge, attitudes and practices questions. Data was analysed using SPSS version 27. Descriptive statistics was used to generate frequencies and percentages. The study found that majority of the participants have adequate knowledge, positive attitudes, and good practices regarding neonatal jaundice. The study found that most participants 21 (60%) were aged between 20 to 29 years. Participants have adequate knowledge, positive attitudes, and good practices on neonatal jaundice. The researchers recommends that future studies using different research approaches should be conducted in other regions in Namibia.

Introduction

Neonatal jaundice is one of the leading causes of preventable brain damage, physical and mental impairments as well as premature infant mortalities in most communities (1). Healthy babies can develop severe neonatal jaundice that may cause irreversible brain damage or even death (2). Marshall and Raynor (3) explained that approximately 60% of term and 80% of preterm babies develop neonatal jaundice in the first week after birth and about 10% of exclusively breastfed babies are still developing neonatal jaundice at one month old. Neonatal jaundice refers to the yellow discolouration of the skin, mucus membranes and the sclera caused by an increased level of bilirubin in the circulation (3). The National Institute of Health and Care Excellence (4) provided normal ranges of bilirubin in term and preterm babies as follows; premature babies less than 24 h their bilirubin should be below 137 mmol/l, from day three to seven and older bilirubin should not be above 256 mmol/l. In addition, in term babies less than 24 h their bilirubin level should be below 103 mmol/l and in seven days and older, bilirubin level should be below 170 mmol/l. A high bilirubin level may be toxic to the developing central nervous system and may cause neurological impairments in new-borns (3).

The study done in Sudan indicated that 62% of nurses had inadequate knowledge and poor practice and attitude towards neonatal jaundice (5). Furthermore, in Egypt the study conducted among 80 nurses, revealed that most of the nurses had poor knowledge and more than three quarters of them had poor level of actual practice regarding neonatal jaundice (6). Nurses with adequate knowledge might be able to educate the mothers and help dispel some myths and socio-cultural beliefs and misconceptions regarding neonatal jaundice among caregivers who are essential in meeting a continuum of care for neonates after birth (5). Adequate knowledge, positive attitude and good practice also contribute to the care of the new born and increase recovery rate. According to the Ministry of Health and Social Services 2021/2022 statistic, there were 103 babies admitted in Windhoek Central Hospital neonatal intensive care unit from December 2021 to March 2022 and 50 babies were diagnosed with neonatal jaundice (7). The researchers could not find previous studies on knowledge, practice, and attitude toward neonatal jaundice among registered nurses in Namibia.

Correspondence to: Emma Maano Nghitanwa, University of Namibia, P/Bag 13301, Windhoek, Namibia
E-mail: enghitanwa@unam.na

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Materials and methods

Ethical considerations. Ethical approval for the study was granted by the University of Namibia, School of Nursing and Public Health Research Ethical Committee. In addition, approval was also granted by the Ministry of Health and Social Service Research Ethics Committee and from the management of Windhoek Central Hospital. Consent form were provided after explanation of the study purpose and process and they were signed by the participants before they participate. Participants were ensured that participation in the study was voluntary. Confidentiality and anonymity was ensured by excluding the participant's identity information in the questionnaire. The study did not pose any direct risk or harm as the questionnaires did not have a question that may cause harm to the participants. Census sampling was used to ensure that all participants had an equal chance of participating in the study.

Study setting. The study context was Windhoek Central Hospital Neonatal intensive care unit. The unit is a 34 beds and is a referral for all intermediate hospitals in the country. According to the statistics, out of 103 babies admitted in Windhoek Central Hospital neonatal intensive care unit from December 2021 to March 2022, 50 babies were diagnosed with neonatal jaundice.

Study design. This study used a quantitative, descriptive, cross sectional research design.

Population and sampling. The population of the study was all 34 registered nurses working at Windhoek Central Hospital neonatal intensive care unit. The list of registered nurses working at the Windhoek Central Hospital neonatal ICU was obtained from the hospital's record and was used as a sampling frame. In this study the sample frame includes 34 registered nurses, and the sample size was the entire population of the registered nurses, since the population size was small. Therefore, no sampling calculation was performed.

Data collection and analysis. Data was collected in August 2022 after the permission on conducting this research granted using the questionnaire developed by the researchers in English. The data collection tool consisted of four sections. Section one collected information on socio-demographic factors; section two is about knowledge, section three consisted of attitude questions and section four was about practices regarding neonatal jaundice.

Validity of the data collection tool was ensured by making sure that questionnaires only include questions related to the study topic and objectives. Further, the items on the data collection tool were clear and understandable and derived from the literature on neonatal jaundice. The questionnaire was also reviewed by a neonatologist and a midwife who are experts in the field. Reliability was ensured by piloting the data collection tool on 10% of the registered nurses working in a neonatal care unity in a referral hospital and no changes were made after piloting. Data was analysed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive univariate analysis was performed for each variable, generating frequencies and percentages for sociodemographic characteristics and variables on knowledge, attitude and practices regarding neonatal jaundice.

Table I. Socio-demographic characteristics of participants.

Social economic parameters	Frequency	Percentage (%)
Gender		
Male	2	5.7
Female	33	94.3
Total	35	100
Age		
20-29	21	60.0
30-39	12	34.3
40-49	2	5.7
Total	35	100
Education level of respondents		
Diploma	6	17.6
First degree	5	14.7
Honours degree	21	61.8
Master's degree	2	5.9
Total	33	100
Years of experience		
1-4	24	68.8
5-9	7	20.0
10-14	2	5.7
15-19	2	5.7
Total	35	100

Results

Data was collected from 35 participants and the response rate was 100%.

Sociodemographic characteristics. As displayed in Table I, majority 33 (94.3%) of participants were female. Most participants 21 (60%) were aged between 20 to 29 years and most 21 (61.8%) have honours degree qualification. The study also found that most participants 24 (68.8%) have 1 to 4 years' experience.

Knowledge of registered nurses on neonatal jaundice. Majority, 34(97.1%) of participants correctly identify the definition of jaundice as the yellowish discolouration of a baby's skin, sclera, and mucous membranes. All participants agreed correctly for the two types of neonatal jaundice, namely physiological and pathological jaundice. Most participants, 24 (68.5%) correctly agree that the total serum bilirubin tests should be used to confirm neonatal jaundice. Majority 30 (85.7%) of the participants also correctly indicated that other factors led to a rise in physiological jaundice is increased haemolysis and the liver's inability to properly metabolize bilirubin. Most 26 (74.3%) participants correctly indicated

Table II. Knowledge of registered nurses on neonatal jaundice (n=35).

Questions regarding Knowledge of neonatal jaundice	Agree	Neutral	Disagree
Neonatal jaundice is the yellowish discoloration of the skin, sclera, and mucus membrane of the baby.	34 (97.1)	1 (2.9)	0
There are two types of neonatal jaundice namely, physiological, and pathological jaundice.	35 (100)	0	0
Physiological jaundice develops due to increased haemolysis and immaturity of the liver to metabolise the bilirubin	30 (85.7)	4 (11.4)	1 (2,9)
Neonatal jaundice can develop in day one of life after birth.	26 (74.3)	4 (11.4)	5 (14.3)
Neonatal jaundice can be confirmed only by taking blood specimen for total serum bilirubin.	24 (68.6)	3 (8.6)	8 (22.9)
Sign and symptoms of neonatal jaundice includes pale stools	20 (57.1)	6 (17.1)	9 (25.7)
Complications of neonatal jaundice includes brain damage due to high levels of bilirubin in a baby's blood.	31 (88.6)	3 (8.6)	1 (2.9)
Infection can be regarded as another cause of neonatal jaundice	24 (68.6)	9 (25.7)	2 (5.7)
Another complication of neonatal jaundice can be deafness due to deposition of indirect bilirubin in the auditory ventricular nucleus cells across the blood-brain barrier.	20 (58.8)	9 (26.5)	5 (14.7)
Neonatal jaundice can be identified by the mother.	23 (65.7)	7 (20.0)	5 (14.3)
Only premature babies that can develop neonatal jaundice.	5 (14.3)	30 (85.7)	0
Danger signs of neonatal jaundice includes neonatal seizures.	22 (62.9)	7 (20.0)	6 (17.1)
One of the causes of neonatal jaundice includes birth trauma	7 (20.0)	10 (28.6)	18 (51.4)
Physiological neonatal jaundice can only be treated with phototherapy.	24 (68.6)	5 (14.3)	6 (17.1)
Early breastfeeding is regarded as one of prevention of neonatal jaundice.	29 (82.9)	4 (11.4)	2 (5.7)
Pathological jaundice can be acquired or inherited.	15 (45.5)	12 (36.4)	6 (18.2)
Acquired neonatal jaundice includes rhesus haemolytic diseases	24 (72.7)	8 (24.2)	1 (3.0)
Inherited neonatal jaundice is due to defect of one of the processes of bilirubin metabolism.	14 (41.2)	15 (44.1)	5 (14.7)

that neonatal jaundice can manifest as early as the first day after birth and 20 (57%) participants indicated that pale stools were seen to be symptoms of jaundice. Many participants 24 (68.6%) agreed that neonatal jaundice can be confirmed only by taking blood specimen for total serum bilirubin. Furthermore, majority 31 (88.6) of the participants agreed that complications of neonatal jaundice include brain damage due to high levels of bilirubin in a baby's blood. The study also found that 24 (68.6%) of the participants agreed that infection can be regarded as another cause of neonatal jaundice. More than half 20 (58.8%) of participants correctly agreed that another complication of neonatal jaundice can be deafness due to deposition of indirect bilirubin in the auditory ventricular nucleus cells across the blood-brain barrier. Further, 23 (65.7%) participants indicated correctly that neonatal jaundice can be identified by the mother.

Majority 30 (85.7%) indicated their neutrality as they were unsure whether only premature babies that can develop neonatal jaundice. Most participants 22 (62.9)% correctly agreed that the danger signs of neonatal jaundice includes neonatal seizures. About half 18 (51.4%) of the participants incorrectly disagree that one of the causes of neonatal jaundice includes birth trauma. However, most participants 24 (68.6%) correctly agreed that physiological neonatal jaundice can only be treated with phototherapy. The study further reveal that majority, 29 (82.9%) correctly agreed that early breastfeeding is regarded as one of prevention of neonatal jaundice. Less than half 15 (45.5% %) agree that pathological jaundice can be acquired or inherited while 12 (36.4%) were neutral. In addition, 24 (72.7%) participants agreed that acquired neonatal jaundice includes rhesus haemolytic diseases. Few participants 15 (44.1%) were neutral whether inherited neonatal jaundice is due to defect of one of the processes of bilirubin metabolism.

Majority of the respondents correctly answered the questions on knowledge, therefore it was concluded that participants have adequate knowledge on neonatal jaundice.

The attitude of registered nurses regarding neonatal jaundice. The questionnaire consisted of 15 statements to assess the attitude of participants on neonatal jaundice. Participants were informed to indicate whether they agree, disagree or neutral for each statements and the results are displayed in Table III.

Majority 30 (85.7%) of the participants agreed that neonatal jaundice disrupts mother and baby bonding and about half 18(51.4%) believe that neonatal jaundice disrupt

Table II. Attitude of registered nurses toward the neonatal jaundice.

Attitudes statements	Agree	Neutral	Disagree
I believe neonatal jaundice disrupts mother and baby bonding.	30 (85.7)	2 (5.7)	3 (8.6)
I believe neonatal jaundice interrupt with exclusive breastfeeding.	18 (51.4)	3 (8.6)	14 (40.0)
I feel babies with neonatal jaundice are at risk of developing other illnesses.	22 (62.9)	8 (22.9)	5 (14.3)
I believe neonatal jaundice delays discharge of babies.	34 (97.1)	0	1 (2.9)
I think babies should be investigated for neonatal jaundice on day 1 of life.	24 (68.6)	9 (25.7)	2 (5.7)
I think phototherapy makes babies restless.	11 (31.4)	11 (31.4)	13 (37.1)
I believe babies under phototherapy can develop fever due to the heat from the light.	25 (71.4)	5 (14.3)	5 (14.3)
I think babies under phototherapy sleeps less due to the heat.	10 (28.6)	13 (37.1)	12 (34.3)
I feel mothers needs support from the relatives when the baby is under phototherapy.	22 (64.7)	9 (26.5)	3 (8.8)
I think nurses should attend trainings and workshops on neonatal jaundice.	34 (97.1)	1 (2.9)	0
I think nurses should be willing to pay for the trainings on neonatal jaundice from their pockets	4 (11.4)	5 (14.3)	26 (74.3)
I feel neonatal jaundice increases anxiety level in mothers.	32 (91.4)	3 (8.6)	0
I think breastfeeding should be commenced immediately after birth in relation of neonatal jaundice prevention.	30 (88.2)	3 (8.8)	1 (2.9)
I feel severe neonatal jaundice affects the baby's neurological development.	24 (68.6)	11 (31.4)	0
I feel neonatal jaundice disturbs the mother's emotional stability.	30 (85.7)	4 (11.4)	1 (2.9)

exclusive breastfeeding. Additionally, 22 (62.9%) agreed that babies with neonatal jaundice are at risk of developing other illnesses. Majority 34 (97.1%) of participants agree that neonatal jaundice delays baby discharge. Most 24 (68.6%) participants agreed that babies should be investigated for neonatal jaundice on their first day of life. In addition, about third 13 (37.1%) of the participants disagreed that phototherapy makes babies restless opposing 11 (31.4%) who agree and neutral respectively. Most participants 25 (71.4%) agreed that they believe that babies under phototherapy can develop fever due to the heat from the light. Few 13 (37.1%) participants indicated to be neutral that babies under phototherapy sleeps less due to the heat while most 22 (64.7%) participants agreed that mothers needs support from the relatives when the baby is under phototherapy. Majority 34 (97.1%) of the participants agreed that nurses should attend trainings and workshops on neonatal jaundice and most 26 (74.3%) agreed that nurses should be willing to pay for the trainings on neonatal jaundice from their pockets. In addition, majority 32 (91.4%) agreed that neonatal jaundice increases anxiety level in mothers. Majority 30(88.2%) also agreed that breastfeeding should be commenced immediately after birth to prevent neonatal jaundice. Most 24 (68.6%) participants agreed that severe neonatal jaundice affects the baby's neurological development and majority 30 (85.7%) agreed that neonatal jaundice disturbs the mother's emotional stability. The results show that majority of the participants have positive attitude towards neonatal jaundice.

Practice of registered nurses regarding neonatal jaundice. The questionnaire consisted of 14 statements to assess the practices about neonatal jaundice. Participants were informed to indicate whether they agree, disagree or neutral for each statements and the results are displayed in Table IV. Few 16 (45.7) participants disagree that they did not attend in-service trainings on neonatal jaundice. Majority 29 (82.9) agreed that they assist mothers with neonatal jaundiced babies with breastfeeding. Majority 34 (97.1) agreed that they provide health education to the parents with new-borns on neonatal jaundice. Majority 31 (88.6) agreed supporting and encouraging mothers to exclusive breastfeed their babies to prevent neonatal jaundice. Majority 32(91.4) agreed helping mothers on how to take their babies out of phototherapy during feeding time. Majority 30 (85.7) agreeing making sure that babies under phototherapy are being turned regularly to expose all parts of the body to the light. Majority 32 (94.1) agreeing ensuring that the eyes of the baby are covered before commencing phototherapy to prevent risk of blindness. The analysis show that majority of the participants have good practices regarding neonatal jaundice.

Discussion

The sociodemographic characteristics of the participants indicated that majority of the participants are middle aged and female. The finding are not surprised as nursing profession is known to be a female profession although males are now emerging joining the nursing profession (8). Furthermore,

Table III. Practices of registered nurses on neonatal jaundice.

Practices statements	Agree	Neutral	Disagree
I do attend in-service trainings on neonatal jaundice.	15 (42.9)	4 (11.4)	16 (45.7)
I do assist mothers with neonatal jaundiced babies with breastfeeding.	29 (82.9)	2 (5.7)	4 (11.4)
I do provide health education to the parents with newborns on neonatal jaundice.	34 (97.1)	0	1 (2.9)
I do support and encourage mothers to exclusive breastfeed their babies to prevent neonatal jaundice.	31 (88.6)	3 (8.6)	1 (2.9)
I do help mothers on how to take their babies out of phototherapy during feeding time.	32 (91.4)	1 (2.9)	2 (5.7)
I make sure babies under phototherapy are being turned regularly to expose all parts of the body to the light.	30 (85.7)	4 (11.4)	1 (2.9)
I make sure the eyes of the baby are covered before commencing phototherapy to prevent risk of blindness.	32 (94.1)	0	2 (5.9)
I do need support from other health care workers in caring of babies with neonatal jaundice.	22 (64.7)	10 (29.4)	2 (5.9)
I always make sure babies under phototherapy are on intravenous infusion to prevent dehydration.	20 (58.8)	10 (29.4)	4 (11.8)
I read procedure manuals on how to commence phototherapy.	23 (67.6)	8 (23.5)	3 (8.8)
I make sure to cover the eyes of the baby under phototherapy.	33 (97.1)	0	1 (2.9)
I do monitor and assess for urine color as one of the signs of neonatal jaundice.	28 (82.4)	5 (14.7)	1 (2.9)
I do encourage mothers to start breastfeeding exclusively immediately after birth to lower risks of neonatal jaundice.	31 (91.2)	2 (5.9)	1 (2.9)
I help mothers with cup feeding of babies under phototherapy.	32 (94.1)	1 (2.9)	1 (2.9)

representation by the middle aged indicated the working age group in Namibia (9). The findings indicated that majority of the participants demonstrated adequate knowledge on neonatal jaundice. This finding could be attribute to the fact that the level of education possessed by the interviewed nurses and their years of experience might influence knowledge as experience facilitate the level of awareness in the subject matter (5). Similar study conducted in Ghana indicated that almost 50% of the nurses demonstrated good knowledge of neonatal jaundice (5). Adequate knowledge among registered nurses is imperative as it leads to the provision of quality nursing care and prevent the development of complications and neonatal mortalities. Contrarily, the study conducted in Egypt reveal that 80 nurses, had poor knowledge on neonatal jaundice (6). The current study reveal the positive attitudes of participants regarding neonatal jaundice. The findings of the current study are similar to a study carried out in Australia that found a positive attitude of majority of respondents towards the neonatal jaundice babies (10). Salia *et al* (5) argue that nurses in the public hospitals are likely to have good attitude towards the neonatal jaundice. However, a study done in Iraq indicated that out of 166 nurses only 47% had positive attitudes on the interventions and complications of jaundice (11). In addition, in Sudan, 62% of nurses had poor attitude towards neonatal jaundice (5) (Adam, 2016). Negative attitude, on neonatal jaundice among registered nurses might as well contribute to high neonatal jaundice among new-born infants. The current study identify that participants have good practice on neonatal jaundice. Nurses with limited knowledge and poor attitude demonstrate good practices toward the neonatal jaundice (5). Moreover, the study done in Egypt showed that all the nurses studied had a satisfactory level of practices on neonatal jaundice related to weight and one quarter of them had satisfactory level of practice related to skin care while only minority had unsatisfactory level of eyes care, diaper care and feeding (11). However, the study conducted in Egypt among nurses indicated that more than three quarters of participants had poor level of actual practice regarding neonatal jaundice (6). In addition in Sudan 62% of 39 nurses had poor practices towards neonatal jaundice (5). Insufficient or incorrect information about neonatal jaundice might be explained as the cause of poor decision and delayed medical attention seeking (1). Adequate knowledge, practice, and positive attitude when it comes to neonatal jaundice is an integral necessity that every nurse working in neonatal intensive care unit should possess to enhance quality nursing care,

Limitation

The study was conducted in one hospital, so the findings could not be generalised. Furthermore, the study only used quantitative approaches. Using a mixed method could have increased chances of getting more information after exploration through qualitative approach.

Conclusions

The study found out that most participants 21 (60%) were between aged 20 to 29 years. Participants have good knowledge, positive attitudes, and good practice regarding neonatal jaundice.

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Ethical approval and consent to participate

Ethical approval for the study was granted by the University of Namibia, School of Nursing and Public Health Research Ethical Committee. In addition, approval was also granted by the Ministry of Health and Social Service Research Ethics Committee and from the management of Windhoek Central Hospital.

Availability of data and material

Data and materials are available by the authors.

Informed consent

Consent forms were provided after an explanation of the study purpose and process and they were signed by the participants before they participated. Participants were ensured that participation in the study was voluntary. Confidentiality and anonymity was ensured.

Conflict of interest

The authors declare no potential conflict of interest.

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