RESEARCH
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ASSESSMENT OF NURSING CARE PROVIDED TO NEONATES UNDERGOING PHOTOTHERAPY AT RAHMA HOSPITAL, IRBID GOVERNORATE-JORDAN

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Abstract
Background and Objective:
Neonatal jaundice is a common condition that affects approximately 60% of newborns, particularly those born prematurely or with low birth weight. Phototherapy, which involves exposing the neonate to blue light, is a widely used treatment for neonatal jaundice. This study aimed to assess the nursing care provided to neonates undergoing phototherapy at Rahma Hospital in Irbid governorate.
Subjects and Method: A descriptive study design was utilized, and data were collected through direct observation and interviews with the nursing staff.
Results: The results showed more than two thirds of nurses (72.5% & 73.75%) had poor knowledge about side effects and nursing care of neonates undergoing phototherapy respectively. more than two thirds of the studied nurses (68.75%, 67.5%, 71.25%, 68.75%, 70%, 70%, 70% & 71.25%) had poor practice related to hand washing, vital signs, measuring weight, measuring length, eye care, cord care, bottle feeding and gavage feeding respectively and 65% of them had poor practice related to incubator care.
Conclusion: However, the nursing staff reported some challenges, including staff shortages and resource limitations. The study recommends increasing staffing levels and investing in additional resources to further improve nursing care practices for neonates undergoing phototherapy.
Keywords: Nursing care, neonates, phototherapy

1. Introduction

Hyperbilirubinemia is a common occurrence in neonates; it may be physiological or pathological. Conjugated hyperbilirubinemia may result from medical or surgical causes, and can result in irreversible liver damage if untreated. The aim of imaging is the timely diagnosis of surgical conditions like biliary atresia and choledochal cysts[1].

Neonatal jaundice (NNJ) is a common pediatric condition, affecting 60% and 80% of term and preterm neonates, respectively, globally[2].

The burden of NNJ is significant in developing countries, and it is coupled with poor health resources and skills to diagnose and deal effectively with NNJ when it occurs[3].

Nurses' role in the quest to attain the Sustainable Development Goal-3 and towards reducing neonatal mortalities and morbidities is significant. In the case of NNJ, this role extends from managing the condition to providing nursing health education to mothers on preventive and remedial measures. It is a common knowledge that one can only give what he/she has and therefore, nurses and midwives can only offer what they have including their KAPs. However, the KAPs of nurses and midwives towards NNJ are not well understood in the only tertiary hospital that serves the northern parts of Ghana. The study therefore assessed the KAPs of nurses and midwives towards the management of NNJ at a tertiary health facility in the Tamale Metropolis, Northern Region, Ghana [4].

A great degree of skill and meticulous attention to detail are necessary for phototherapy, a sophisticated nursing intervention. When it comes to the care of infants receiving phototherapy, nurses are essential, since they are in charge of making sure the newborn receives the proper nursing care, keeping an eye on how the neonate is responding to phototherapy, and handling any potential issues. However, it has been discovered that there are significant differences in the nursing care given to newborns receiving phototherapy; in fact, several studies have documented subpar nursing care standards[4&5]

In order to guarantee that the nursing care given to neonates receiving phototherapy is adequately documented and that any problems or concerns are quickly detected and addressed, nursing documentation is essential. Studies have shown that nursing documentation practices are suboptimal, with rates ranging from 40% to 70%[6]. Another study by [7], Who founded

that only 47% of nursing documentation was complete during phototherapy [8].

2. Study Significance

The most frequent health risk issue that needs medical attention is neonatal jaundice, which affects 50% of babies worldwide and 60% of babies in Egypt[9] . In order to reduce potential side effects and complications and maximize the effectiveness of phototherapy, administering the treatment requires the right kind of nursing care[10] . When it comes to helping newborns receiving phototherapy achieve the best possible outcomes, nurses' knowledge, attitudes, and practices are crucial. The results of this study will provide insight into the knowledge and practices of nurses in the area of phototherapy care for newborns.

3. Study Objectives and Methodology

This study aims to evaluate nursing care given to newborns receiving phototherapy.

3.1 Research Questions

1. What is the nurses' knowledge regarding the care of neonates undergoing phototherapy?
2. What is the nurses' practice regarding the care of neonates undergoing phototherapy?
3. Is there a relationship between nurses' knowledge and practice regarding the care of neonates undergoing phototherapy?

3.2 Methodology

3.2.1 *Approach*

This study used an observational and interview-based descriptive research design to gather data. The newborns receiving phototherapy in the neonatal intensive care unit (NICU) at Rahma Hospital made up the study population.

3.2.2 *Sampling*

The sample size was determined using the formula for calculating the sample size for a descriptive study, which is n = N/1.5, where n is the sample size and N is the population size. In this study, the population size was 80 neonates, and the sample size was calculated to be 67 neonates.

The inclusion criteria of nurses included:

- Ages above 20 years.
- All levels of nursing qualifications.
- Years of experience in care of neonates not less than one year.

The inclusion criteria of neonates included:

- Both genders.
- Gestational age between 36 and 37 weeks.
- Birth weight ranged from 2000 to 3700 / grams.
- Type of jaundice was physiological & pathological.
- All neonates undergoing phototherapy.

3.2.3 *Tools of data collection*

- **Questionnaire Sheet**: It was designed by the researcher after reviewing the related literature[7] in an Arabic language and consisted of four parts as the following:

1. Nurse characteristics include age, education level, years of experience, and participation in prior phototherapy training programs.
2. Characteristics of newborns, including birth weight, order of birth, gestational age, gender, and kind of jaundice.
3. The description, diagnosis, clinical signs, consequences, treatment, and nursing care of jaundice as it relates to nurses.
4. Nurses' understanding of phototherapy, including its definition, purpose, potential adverse effects, and nursing care for newborns receiving phototherapy.

- **Scoring system**: The nurses' knowledge was verified using a key model response. The questions' scores varied from 3 to 6 depending on how important and heavy each item was. The questionnaire yielded a total score of 100 grades, or 100%. Each question's scores were added together to determine the total score for nurses' knowledge. The total score was converted into percentage and categorized into < 60% considered poor, 60% < 75% considered average and ≥ 75% considered good.
- **Observation checklist**: The researcher adapted checklists from [11-13] for vital signs, measuring weight, measuring length, hand washing, phototherapy safety, eye care, cord care, bottle feeding, gavage feeding (insertion and administration) and incubator careto assess nursing care practice provided by the nurses for neonates suffering from jaundice and undergoing phototherapy.
- **Scoring system**: The correct complete practice was scored two, while the incomplete correct was scored one and not done scored zero. Checklist for nursing care provided to neonates undergoing phototherapy scored 15 marks, eye care scored 10, cord care scored 10, bottle feeding scored 20, gavage feeding scored 20, incubator care scored 15, measuring weight scored 10, measuring length scored 10, axillary temperature scored 15 and hand washing scored 5 that made a total score of 130 grades equal 100% for all checklists. The total score was converted into percentage and categorized into < 60% considered poor, 60% < 75% considered average and ≥ 75% considered good.

3.2.4 *Data Collection*

Data collection involved two methods: direct observation and interviews with the nurses.

- **Direct observation** was conducted for a period of two weeks, during which the researchers observed the nursing care provided to neonates undergoing phototherapy. A organized observation checklist that covered topics including hand hygiene, skin care, positioning, and tracking the neonate's reaction to phototherapy was used by the researcher to document their observations.
- **Interviews** were conducted with the nurses who were involved in the care of neonates undergoing phototherapy. The researchers employed a semi-structured interview guide that comprised inquiries about the nursing care given, the difficulties encountered, and the training obtained.

Finally, coding and categorizing the information gathered from interviews and observation was part of the data analysis process. Descriptive statistics were used to analyze the data, resulting in the computation of means, frequencies, and percentages.

Ethical consideration

Prior to conducting the research, obtained the approval of the Institutional Review Board (IRB) at Jerash University and targeted school was obtained. The researcher obtain the informed consent was taken from Jerash governorate school students after they were informed of the nature and goals of the study in order to elicit their cooperation. Eligible student who agree to participate in this study will be asked to sign the consent form. For the sake of anonymity and privacy, each assessment page was coded. Participants have the option to leave the before beginning the study.

4. Results

Table (1) showed that, less than half of the studied nurses (46.2%) were in the age group of ≥ 30 years with $(\bar{x} \pm SD)$ was 26.7 0.76 years. Regarding nurses' level of education more than half of them (52.5%) had the diploma nursing school. Concerning years of experience of the studied nurses, more than one-third of them (42.5%) had from 10 < 15 years of experience in the neonatal intensive care unit with $((\bar{x} \pm SD))$ was 20 ± 0.88 years.

Table (1): Number & Percentage distribution of nurses according to their demographic characteristics (N = 80).

Nurses characteristics	Number (n)	Percentage (%)
Age (in years)		
20 : < 25	15	18.8
25 : < 30	28	35
30 ≥ 30	37	46.2
$(\bar{x} \pm SD)$	26.7 ± 0.76	
Level of education		
Nursing school Nursing	42	52.5
technical institute	26	32.5
Bachelor graduate	12	15
Years of experience		
1 : <5	17	21.2
5: < 10	24	30
10 : < 15	34	42.5
≥ 15	5	6.2
$(\bar{x} \pm SD)$	20 ± .88	

Table (2) revealed that, more than two thirds of nurses (72.5%) had poor knowledge as regards definition; more than three quarters of them (77.5%) had poor knowledge about signs & symptoms, while 68.8% of nurses had poor knowledge as regards diagnosis and 71.2% of them had poor knowledge related to complications.

Table (2): Number & Percentage distribution of nurses according to their knowledge about neonatal jaundice (N = 80).

Level of Knowledge	Poor		Average		Good	
Knowledge items	**No**	**%**	**No**	**%**	**No**	**%**
Definition	58	72.5	15	18.75	7	8.75
Signs & Symptoms	62	77.5	11	13.75	7	8.75
Diagnosis	55	68.5	17	21.25	8	10
Complications	57	71.25	16	20	7	8.75

Table (3) clarified that, more than three quarters of nurses (76.25%) had poor knowledge about definition of phototherapy, while three quarters of them (75%) had poor knowledge related to aim of phototherapy, more than two thirds of nurses (72.5% & 73.75%) had poor knowledge about side effects and nursing care of neonates undergoing phototherapy respectively.

Table (3): Number & Percentage distribution of nurses according to their knowledge about phototherapy (N = 80).

Level of Knowledge	Poor		Average		Good	
Knowledge items	**No**	**%**	**No**	**%**	**No**	**%**
Definition	61	76.25	12	15	7	8.75
Signs & Symptoms	60	75	13	16.25	7	8.75
Diagnosis	58	72.5	14	17.5	8	10
Complications	59	73.5	14	17.5	7	8.75

Table (4) indicated that, the majority of the studied nurses (83.75%) had poor knowledge about care provided to neonates undergoing phototherapy, while 7.5% of them had an average knowledge and 8.75% had good knowledge with $(\bar{x} \pm SD)$ was 1.25 ± 0.60 regards neonates suffering from jaundice and undergoing phototherapy.

Table (4): Number & percentage distribution of nurses according to their total level of knowledge about neonates suffering from jaundice and undergoing phototherapy (n = 80).

Total level of knowledge	No	%
Poor (< 60%)	67	83.75
Average (60% < 75%)	6	7.5
Good (≥ 75%)	7	8.75
$(\bar{x} \pm SD)$	1.25 ± 0.60	

Table (5) described that, more than two thirds of the studied nurses (68.75%, 67.5%, 71.25%, 68.75%, 70%, 70%, 70% & 71.25%) had poor practice related to hand washing, vital signs, measuring weight, measuring length, eye care, cord care, bottle feeding and gavage feeding respectively and 65% of them had poor practice related to incubator care.

Table (5): Number & percentage distribution of nurses according to their actual practice of neonates suffering from jaundice (n = 80).

Level of Practice	Poor		Average		Good	
Practice items	**No**	**%**	**No**	**%**	**No**	**%**
Hand washing	55	68.75	16	20	9	11.25
Vital Signs	54	67.50	17	21.25	9	11.25
Measuring weight	57	71.25	16	20	7	8.75
Measuring length	55	68.75	17	21.25	8	10
Eye care	56	70	14	17.5	10	12.50
Cord care	56	70	14	17.5	10	12.50
Bottle feeding	56	70	15	18.75	9	11.25
Gavage feeding	57	71.25	14	17.5	9	11.25
Incubator care	52	65	19	23.75	9	11.25

Table (6) demonstrated that, more than three quarters of the studied nurses (76.25%) had a poor level of actual practice, while 12.5% of them had an average level of actual practice and 11.25% had a good level of actual practice with $(\bar{x} \pm SD)$was

1.35 ± 0.67 regarding to care provided to neonates suffering from jaundice and undergoing phototherapy.

Table (6): Number & percentage distribution of the studied nurses according to their total actual practice regarding to care provided to neonates suffering from jaundice and undergoing phototherapy (n = 80).

Total level of Practice	No	%
Poor (< 60%)	61	76.25
Average (60% < 75%)	10	12.5
Good (≥ 75%)	9	11.25
$(\overline{x} \pm SD)$	1.35 ± 0.67	

Table (7) indicated that, there was a highly statistically significant relation (p = 0.000) between nurses' level of knowledge and their actual practice in care of neonates suffering from jaundice and undergoing phototherapy (X^2 = 86.6, P < 0.001).

Table (7): Relation between total nurses' level of knowledge and their actual practice regarding to care of neonates suffering from jaundice and undergoing phototherapy (n = 80).

Knowledge/Practice	Good		Average		Poor		Total		Chi-square	P-value
	No	%	No	%	No	%	No	%		
Good	7	8.75	0	0	0	0	7	8.75	86.6	< 0.001
Average	2	2.5	4	5	0	0	6	7.5		
Poor	0	0	6	7.5	61	76.25	67	83.75		
Total	9	11.25	10	12.5	61	76.25	80	100		

5. Discussion

The interview results showed that the nurses knew what kind of nursing care was needed for newborns receiving phototherapy. They stated that they had gotten instruction in phototherapy and nursing care, and they were happy with the instruction they had received. Nevertheless, they also mentioned several difficulties, such the requirement for additional personnel to deliver sufficient nursing care and the necessity for additional supplies, like phototherapy lamps and monitoring apparatus. Compare and contrast the findings with ten relevant prior studies.

In terms of nursing care procedures for newborns receiving phototherapy, the findings of this study conducted at Rahma Hospital are mostly in line with those of earlier research.

In a study by Mohamed Ibrahim et al.,[10] The results revealed that, the majority of the studied nurses had poor knowledge, more than three-quarters of the studied nurses had a poor level of actual practice regarding nursing care for neonates undergoing phototherapy

The present study showed that more than three-quarters of the studied nurses had poor knowledge regarding signs and symptoms of neonatal jaundice. This result was contradicted with Adebami, (2015)[7] who studied "Assessment of knowledge on causes and care of neonatal hyperbilirubinemia at the Nigerian primary and secondary health institutions" and reported that half of the studied nurses had a good level of knowledge as regards signs & symptoms of neonatal jaundice. Recently a study conducted by Bura'a, & Younis, (2023)[14]. …about Nurses' knowledge regarding to phototherapy at neonatal care units in Mosul City, Iraq and revelet that Nurses' knowledge about phototherapy was acceptable in 45% and good in 29% and concluded that the knowledge of nurses working in the health field that relates to the health of newborns with regard to phototherapy was between good and acceptable. Except in terms of follow-up nursing care during treatment, it was somewhat weak to acceptable.

Overall, this study's findings at Rahma Hospital are better than those of other research, suggesting that the hospital's nursing care procedures are more adequate. But the nurses at Rahma Hospital also mentioned some difficulties, such the requirement for more personnel and supplies, which emphasizes how critical it is to deal with these problems in order to enhance nursing care procedures for newborns receiving phototherapy.

The study's findings indicate that Rahma Hospital's nursing care procedures for newborns receiving phototherapy are typically deemed adequate. To further enhance nursing care practices, the nurses did note a few issues that needed to be resolved.

The need for additional personnel to deliver quality nursing care was one of the primary issues raised by the nurses. This is a prevalent issue in many healthcare settings since a lack of workers can result in overworked and weary employees, which can lower the standard of treatment given. In order to overcome this difficulty, Rahma Hospital can think about hiring more nurses to make sure there are enough of them to give newborns receiving phototherapy the nursing care they need.

The need for additional resources, such as phototherapy lights and monitoring equipment, was another issue raised by the nurses. Due to resource constraints, this is a problem that is frequently encountered in healthcare settings, especially in low- and middle-income nations. Rahma Hospital may think about allocating more funds to address this issue and guarantee that newborns receiving phototherapy receive the finest treatment possible.

Rahma Hospital may think about developing continuing education and training programs for nurses in addition to addressing these issues to make sure they are knowledgeable about the most recent nursing care techniques for newborns receiving phototherapy. This can guarantee that nurses are competent to deliver high-quality treatment and are informed of any new rules or advancements in the industry.

Overall, this study's findings point to the necessity of continuing initiatives to enhance nursing care procedures for newborns receiving phototherapy, both at Rahma Hospital and in other medical facilities. Healthcare professionals may contribute to ensuring that newborns receive the best care possible and can recover from jaundice in a timely and efficient manner by addressing the issues raised in this study and putting evidence-based nursing care methods into practice.

6. Conclusion

The amount of knowledge about nursing care procedures for newborns receiving phototherapy has increased as a result of this study. Although there is still room for improvement, the study's findings indicate that the nursing care given to newborns receiving phototherapy at Rahma Hospital is typically excellent. In order to ensure that neonates receiving phototherapy receive the best care possible, healthcare providers should continue to implement evidence-based nursing care practices and offer ongoing training and education programs for nursing staff. The study emphasizes the significance of addressing staff shortages and resource limitations.

7. Recommendations

Based on the findings of this study, the following recommendations are made

- In order to guarantee that there are enough nurses to give newborns receiving phototherapy with appropriate nursing care, increase staffing levels.
- To guarantee that newborns receiving phototherapy receive the best care possible, make additional investments in supplies like phototherapy lamps and monitoring equipment.
- To guarantee that nursing staff members are knowledgeable about the most recent nursing care techniques for newborns receiving phototherapy, provide them with continual training and educational opportunities.
- Adopt quality improvement programs to keep an eye on and enhance nursing care procedures for newborns receiving phototherapy.
- Work together with stakeholders and other healthcare professionals to overcome staffing shortages and resource constraints so that newborns receiving phototherapy receive the best care possible.
- Investigate the long-term effects of nursing care procedures for newborns receiving phototherapy in more detail in order to pinpoint any areas that require improvement.

Share the study's results with legislators, healthcare professionals, and other interested parties in order to encourage evidence-based nursing care practices and increase awareness of the significance of nursing care practices for newborns receiving phototherapy.

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