Effect of Education Program regarding Bilisphere Phototherapy on Nurses' Performance and Outcomes of Neonates with Pathological Jaundice

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Abstract:

Background: Pathological jaundice is the most encountered medical problem in the first one week of life. Bilisphere phototherapy is a new modality in management of pathological jaundice. Nurses play an important role in achieving optimal outcomes for neonates under bilisphere. **Aim of the study:** This study aimed to evaluate the effect of education program regarding bilisphere phototherapy on nurses' performance and outcomes of neonates with pathological jaundice. **Research design:** A quasi-experimental research approach was used. **Setting:** This study was carried out at Benha Specialized Pediatric Hospital, Neonatal Intensive Care Units. **Study subjects:** A convenient sample of all nurses who work in the aforementioned setting and a purposive sample of newborns selected for the study. **Data collecting tools:** Three tools were employed: **Tool I:** A structured interviewing questionnaire sheet consisted of 4 sections, **Tool II:** Observational checklist for caring neonates under bilisphere and consisted of 3 sections, **Tool III:** Neonatal outcomes evaluation sheet: It consisted of 2 sections. **Results:** The majority of the studied nurses had satisfactory knowledge and competent practice after-education program implementation. **Conclusion:** The outcomes for neonates (study group) and the performance of nurses were positively correlated after- program implementation. **Recommendations:** Periodical in-service education programs regarding pathological jaundice should be designed and implemented to improve nurses' knowledge based on nurses' actual needs.

Keywords: Bilisphere phototherapy, Education program, Neonates' outcomes, Nurses' performance, Pathological jaundice.

Introduction:

Neonatal production rate of bilirubin is 6-8 mg/kg/24hr (in contrast to 3-4 mg/kg/24hr in adults) **(Kliegman et al., 2020).** Bilirubin is produced from the catabolism of heme, a breakdown product of hemoglobin, in the Reticuloendothelial System (RES). First, heme is converted to biliverdin, releasing iron and carbon monoxide via the action of enzyme heme oxygenase. Biliverdin is then converted to bilirubin by the enzyme biliverdin reductase, bilirubin are 2 types direct and indirect **(Harsha et al., 2020).**

Indirect pathological jaundice is characterized by rapidly rising bilirubin concentrations in neonates, palms, soles are yellow, stool is clay or white colored and urine is staining clothes. If pathological jaundice is not identified and treated right away, it may result in kernicterus or bilirubin encephalopathy. Even survivors may experience a variety of neurological aftereffects, including gaze palsy and hearing loss. Because neonatal pathological jaundice is associated with both fatal and non-fatal health effects, it is therefore a concern for

various nations worldwide **(Sisay et al., 2023).**

The most common management for reducing bilirubin level in neonates with pathological jaundice is conventional phototherapy, but bilisphere therapy is more effective in lowering total serum bilirubin as it is effective in reducing hazards of electrolyte disturbance, bronze baby syndrome and reducing the use of the invasive maneuver of exchange transfusion with its serious neurological complications **(Stegman, 2024).**

Bilisphere phototherapy is a novel management for indirect pathological jaundice which provides intensive therapy with short management time. This means less workload for nurses and early neonate mother contact with early discharges. Bilisphere phototherapy well tolerated and safe device, as it decreases the need for exchange transfusion or drugs. Additionally, red colored side windows protect neonates and medical teams from the adverse effect of the blue light **(Datta, 2022).**

Bilisphere phototherapy has specific properties compared to other types of phototherapies which should have air temperature, skin temperature adjusted according neonate status and noise level < 55 dBA. Also, bilisphere 360 led has a screen 5.1-inch monochrome. Additionally, spectral irradiance > 100 µW/cm²/nm, wavelength interval 440 nm – 460 nm, maximum weight of IV pole 2 kg, monitor box 6 kg and power supply 50-60 Hz **(Bogalech, 2023).**

Nursing role toward care of neonates with pathological jaundice focused on care of bilisphere phototherapy before, during and after intervention to achieve optimal outcomes of neonates. Nursing roles begin with neonate preparation to receive therapy and bilisphere phototherapy preparation by ensuring its function and safety, continuing with assessment of neonate and the device during therapy and ending with discharge of neonate from bilisphere phototherapy to the incubator followed by bilisphere sterilization **(Kliegman & Schuh, 2020).**

Operational definitions:

Nurses' Performance:

-Nurses' knowledge regarding pathological jaundice and bilisphere phototherapy which measured by a structured interviewing questionnaire sheet.

-Nurses' practices regarding care of neonates suffering from pathological jaundice and managed with bilisphere phototherapy which measured by observational checklist.

Outcomes of Neonates: Neonates condition immediately after discharge from bilisphere phototherapy which measured by neonatal medical assessment sheet, neonatal reflexes and bilirubin induced neurological dysfunction (BIND) score.

Bilirubin Induced Neurological Dysfunction (BIND) Score: It is a score used to assess neonatal neurological status and evaluate severity of pathological jaundice. It would include mental status, muscle tone and cry pattern.

Significance of the study:

Pathological jaundice is the most common health hazard for neonates. Worldwide, there were 481,000 cases estimated of neonates' pathological jaundice with 114,000 deaths and 75,000 of survivors developing kernicterus **(World Health Organization (WHO), 2020).** On the same direction, **Diala et al., (2023)** reported that, the Global Burden of Disease study ranks pathological jaundice among the top 5–10 causes of neonatal deaths. Additionally, Africa had the highest incidence of pathological jaundice where 667,8 per 10,000 live births, followed by the

Southeast Asian, Eastern Mediterranean, Western Pacific, American and European regions **(Shehu et al., 2019).**

Egypt is one of the developing countries that is recorded to have higher incidence of severe hyperbilirubinemia, about 20.4% of neonates develop pathological jaundice yearly **(Sayed et al., 2021).** In addition, according to **Statistical Office. (2023)** at Benha Specialized Pediatric Hospital, there were 1121 cases admitted to NICUs, around 360 cases of them diagnosed with pathological jaundice and according to **Statistical Office. (2024)** in the first 7 months there were 603 cases admitted to NICUs, around 192 cases of them diagnosed with pathological jaundice and most of them need bilisphere .

Bilisphere phototherapy is proved to be almost four times as effective as conventional phototherapy. This means serum bilirubin decreased 1.29 ± 0.45 mg/dL/h and 0.31 ± 0.13 mg/dL/h in bilisphere and conventional phototherapy, respectively. The difference was 0.98 ± 0.23 mg/dL/h, ($P < 0.0001$). Additionally, the duration of management was much shorter at 6.45 ± 2.3 h in comparison with 22 ± 10.8 h in conventional phototherapy (a difference of 15.5 ± 6.8 h, $P < 0.0001$ **(Shehadeh et al., 2023).** So that, the current study was conducted to shed light on importance of nurses' performance regarding care of neonates undergoing bilisphere to achieve the best outcomes of neonates with pathological jaundice.

Aim of the study:

This study aimed to evaluate the effect of education program regarding bilisphere phototherapy on nurses' performance and outcomes of neonates with pathological jaundice.

Research hypotheses:

H.1: The total scores of nurses' performance regarding bilisphere phototherapy would be improved after- program implementation.

H.2: The outcomes scores of neonates with pathological jaundice after bilisphere phototherapy will be improved after- program implementation.

H.3: There would be a statistical significant correlation between nurses' performance and neonates' outcomes after-program implementation.

Subjects and Method:

Research design:

A quasi-experimental research approach was used.

Setting:

Benha Specialized Pediatric Hospital, which affiliated to the Specialized Medical Centers Secretariat is one of the sectors of the Ministry of Health and population. The current study was carried out at the Neonatal Intensive Care Units.

Study subjects:

-A convenient sampling of the sixty nurses who are employed in the aforementioned setting.

-A purposive sample of ninety neonates with pathological jaundice calculated with Slovin's formula n=N/1+N(e)2 would be split into study and control groups based on the following inclusion criteria:

Inclusion criteria of neonates:

- Newborns with hemolytic pathological jaundice who were 35–42 weeks gestational.

Exclusion criteria for neonates:

-Neonates suffering from kernicterus or acute bilirubin encephalopathy.

Data collecting tools: Three tools were employed to achieve the aim of the study:

Tool (I): A structured interviewing questionnaire sheet:

The researchers created, modified, and prepared this tool in Arabic language, and the

supervisors reviewed it. It was divided into 4 sections:

Section 1- Characteristics of nurses', including: age, years of experience, and training programs for bilisphere phototherapy.

Section 2- Characteristics of neonates', as: gestational age, mode of delivery, and medical background, including causes of pathological jaundice.

Section 3- Knowledge of nurses about neonatal pathological jaundice: It was used to evaluate the nurse's knowledge, based on **Kimble et al., (2022)** and modified by the researchers.

Section 3- Knowledge of nurses about the bilisphere: It was used to evaluate the nurse's knowledge, based on **Rohra, (2023)** and modified by the researchers.

Knowledge scoring system for nurses:

The following categories would comprise the scoring system for the nurses' expertise under study: two points would be awarded for a complete and accurate response, one point for an incomplete correct response, and zero point for an incorrect or unknown response. **The sum of the nurses' knowledge scores would be determined as follows:**

The knowledge items had forty-two degrees overall score.

- The nurses' responses were deemed to be satisfactory if they are more than thirty-six degrees, or more than or equal 85%.
- The nurses' responses were deemed unsatisfactory if they are less than thirty-six degrees, or less than 85%.

Tool (II): Observational checklist for caring neonates under bilisphere: It was utilized to evaluate nurses' bilisphere phototherapy practices, which were modified from **Datta, (2022) and Valley, (2022)** and modified by the researchers. It consisted of three sections as follows:

Section 1: The practice of nurses prior to bilisphere included forty-six items. **Section 2:** The practice of nurses during bilisphere included twenty-five components. **Section 3:** There were twenty-one elements in the nurses' practice following bilisphere.

Nursing practice scoring system:

The following would be used as the scoring method for the practice of the nurses under study. The nurses' practice was classified as done one score and not done zero score. The total scores of nurses' practice would be calculated as the following :

The total score of practice items were ninety- two degrees.

- It was deemed competent practice if the nurses' responses are ≥ seventy-eight degrees, which corresponds to 85–100%.
- It was deemed incompetent practice if the nurses' responses are less than seventy-eight degrees, or less than 85%.

Tool (III): Neonatal outcomes evaluation sheet: Information was gathered by the researchers as soon as the newborn was discharged from bilisphere phototherapy in order to make sure that all neonates' conditions had a bilisphere effect, whether it was positive, stable, or negative, requiring further intervention. It consisted of two sections:

Section 1- Medical assessment sheet for newborns:

The researchers made changes to it based on **Pemde et al., (2022).** The information was taken from the neonate's medical assessment sheet and included neonates' vital signs and bilisphere phototherapy side effects.

Section 2- Neonatal reflexes:

It was adapted from **Brazelton, (1973)** to assess neonatal reflexes. The researchers selected only primitive reflexes 8 from 16

reflexes because other reflexes not suitable with age of study sample.

Scoring system of neonatal reflexes:

Neonatal reflexes tool consisted of 8 reflexes. Each item would be earned 0 or 1 or 2 or 3 while (0) indicated no response, (1) indicated hypoactive response, (2) indicated normal response and (3) indicated hyperactive response. The total score would be ranged from 0-24.

Administrative design:

An official permission for data collection was obtained from the administrators of the previously mentioned setting to carry out the study after submitting a letter from the Dean of the Faculty of Nursing, Benha University. A clear explanation was given about the nature, importance and expected outcomes of the study.

Content validity:

To ascertain the degree to which the items related to one another, clarity, relevance, comprehensiveness, simplicity, and applicability, a panel of three experts who are Pediatric Nursing Professors from Benha University's Faculty of Nursing revised the data collection tools. The necessary changes were then made. In order to verify the validity of the study instruments, reliability was conducted.

Reliability of the tools:

The Cronbach's alpha coefficient test was used to assess the study instruments' internal consistency and reliability. The Cronbach's alpha value (internal validity) of knowledge questionnaires was 0.99 and for observational checklists was 0.98. This suggested that the study instruments had a high level of dependability

Ethical considerations:

An approval from the Scientific Research Ethics Committee, Faculty of Nursing, Benha University was obtained, code REC-PN-P63. Prior to data collection, the parents of the newborn and the nurses gave their verbal and written consents, guaranteeing complete secrecy and privacy.

Pilot study

A pilot study was carried out during August 2023 (1 month), to test the reliability and applicability of the study tools and estimate the proper time required by nurses for answering the questionnaire. All participants in the pilot study were included in the sample where no radical modifications were carried out in the study tools as revealed from the pilot study.

Fieldwork:

The following phases were adopted to achieve the aim of the current study, assessment, planning, execution and evaluation phases. These phases cover an eight months period (from the beginning of September 2023 to the end of April 2024). It was collected according to the policy of the study setting. Data was collected three days/week.

The researchers separated the neonates under study into two groups. The first group was the control group forty-five neonates, which was evaluated prior to the start of the education program "assessment phase" in order to determine how nurses' performance affected the outcomes of the neonates. In order to determine how nurses' performance affected the outcomes of newborns, the researchers evaluated the second group, the study group forty-five, following the implementation of an education program "the evaluation phase".

(a) Phase of assessment:-

Information gathered during this stage prior to the education program implementation. Using the prior study tools,

the questionnaires were given to each nurse separately in order to evaluate their performance and ascertain their needs with relation to bilisphere phototherapy and pathological jaundice .

Answering questions regarding knowledge and personal information often takes 5 to 10 minutes. In order to accurately assess each nurse's practice, an observational checklist was used to watch them individually during their actual practice. The researchers estimated that it took each nurse an average of 15 to 20 minutes to complete the checklist. Two to three nurses were interviewed on average each day.

Additionally, the researchers collected data on the neonates under study (control group) for a period of 5 to 10 minutes. It took 25–40 minutes to complete all of the data collecting forms.

(b) Phase of planning:

In this step, the actual needs of the nurses being studied were ascertained, and the outcomes of the assessment phase (before-test) were analyzed. The researchers produced an educational program with simple Arabic language and images to aid nurses in understanding the program.

(c) Implementation phase:

It was implemented following an assessment of the nurses' performance and the determination of their needs for pathological jaundice and bilisphere phototherapy. 8 sessions, 3 for the theoretical and 5 for the practical, were held in the NICU over the course of three days per week. Each session started with a summary of the previous one and the objectivity of the current one. Each nurse had an opportunity to share information and ask questions during the session, which was conducted in a circle with the researchers.

- A total of 8 sessions, each lasting 40 to 50 minutes, were held across four months (November 2023 to the end of February 2024). Furthermore, eight study sessions were carried out utilizing a variety of media and teaching methods.
- An acceptable schedule for nurses was developed, which included the date, time, place, topics, and duration of each session. It was challenging to accommodate all of the nurses at once due to the NICU's workload. They divided into twelve groups of four to six nurses each session to take measures.

(d) Phase of evaluation:

Following the execution of the bilisphere phototherapy education program, after-test was given to evaluate nurses' knowledge and skills. Using the same tools as the before test, the researchers also evaluated the outcomes of the neonates under study (the study group). This aided in assessing how the education program's implementation affected nurses' performance and the outcomes for newborns with pathological jaundice. Two to three nurses were questioned on average each day, and after-test phase lasted two months (from the start of March 2024 to the end of April 2024).

Statistical analysis:

The collected data was coded and transformed into a specially designed form to be suitable for computer entry process. Data was entered and analyzed by SPSS (Statistical Package of Social Science). Software graphics were done by using Microsoft office excel program. Quantitative data was presented by mean and standard deviation. Qualitative data was presented in the form of frequency distribution tables, number and percentage; it was analyzed by Chi-square test.

Results:

Figure (1) portrays that, less than two thirds (61.7%) of the studied nurses had < 5 years' experience.

Figure (2) clarifies that, less than half (46.6% &48.8%) of the studied neonates in the control and study groups were 35 < 37 weeks of gestational age, respectively.

Figure (3) shows that, after implementing an education program, more than three quarters (75.8%) of the nurses in the study had satisfactory knowledge, whereas only one third (33.3%) did so before.

Figure (4) indicates that, in comparison to more than two fifths (41.7%) of the nurses who were studied, the majority (85.9%) had a competent level of overall practice in the implementation of after-education programs.

Table (1) shows that, the majority (93.3%) of neonates in the study group had normal condition related side effects compared to less than one fifth (17.8%) in the control group after discharge from bilisphere phototherapy.

Figure (5) shows that, more than three quarters (77.7%) of neonates in the study group had moderate response of reflexes compared to more than one fifth (28.9%) in the control group after discharge from bilisphere phototherapy.

Table (2) demonstrates that, nurses' overall knowledge and practice of bilisphere before and after the introduction of education program were positively correlated.

Table (3) shows that, the results of the study group's neonates and the nurses' overall knowledge and practice of bilisphere phototherapy at the after-education program's implementation were positively correlated.

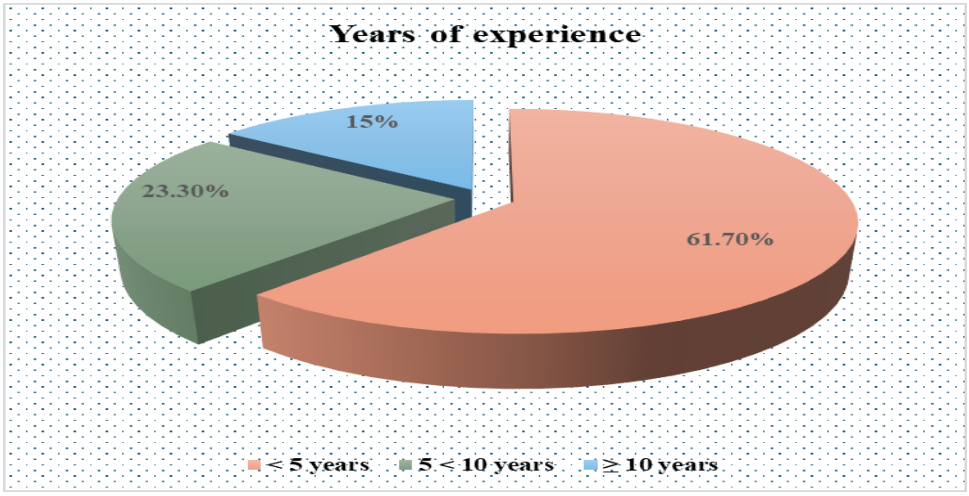

Figure (1): Distribution of the studied nurses according to their years of experience "n=60"

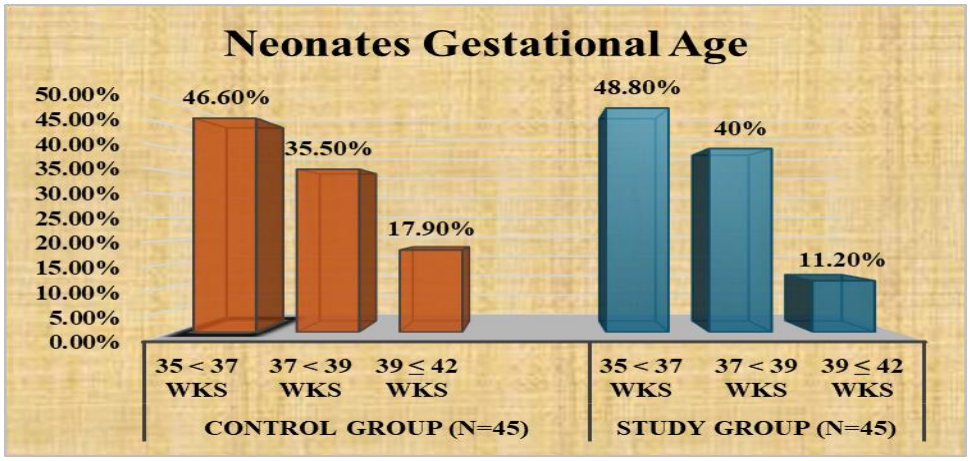

Figure (2): Distribution of the neonates under study by gestational age in the control and study groups "n=90"

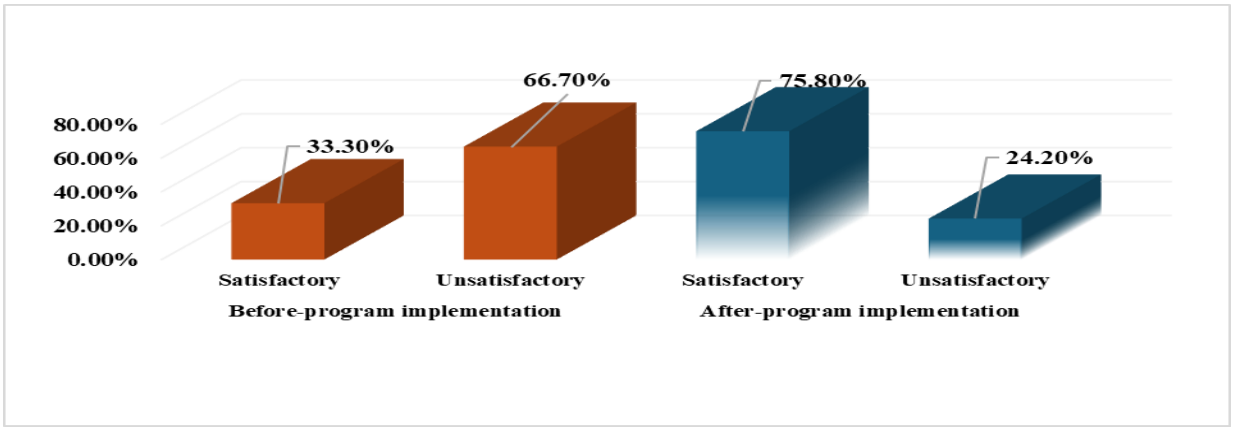

Figure (3): Comprehensive knowledge of nurses regarding bilisphere and pathological jaundice before and after the education program "n= 60"

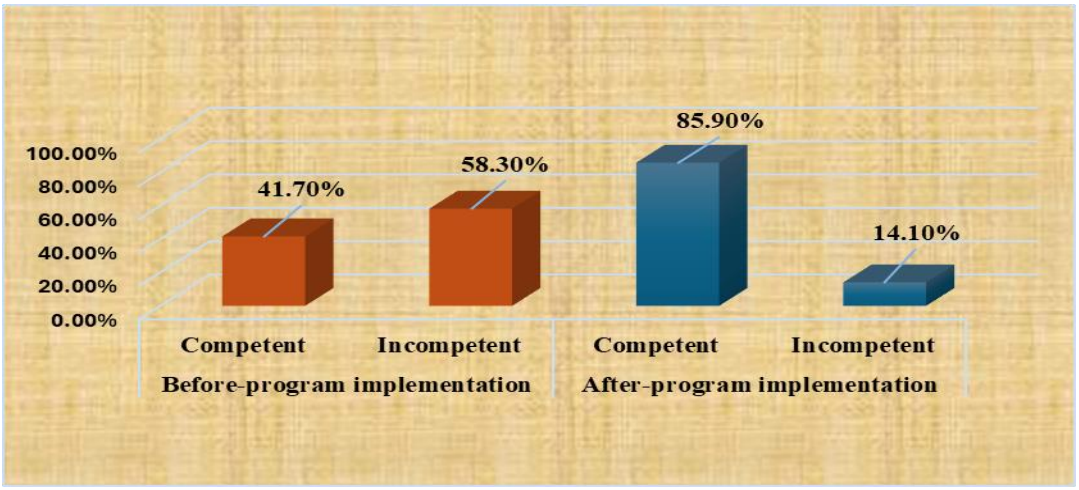

Figure (4): The sum of the nurses' practice scores for caring newborns with pathological jaundice before and after the implementation of the education program "n=60"

Table (1): The control and study groups' distribution of the newborns under study based on their medical evaluation "n= 90"

Neonates' outcomes	Control group (n= 45)				Study group (n=45)				X^2	p-value
	Normal		Abnormal		Normal		Abnormal			
	No.	%	No.	%	No.	%	No.	%		
Vital signs										
Temperature	19	42.2	26	57.8	32	71.1	13	28.9	24.00	0.000**
Pulse	10	22.2	35	77.8	34	75.5	11	24.5	35.00	0.000**
Respiration	12	26.7	33	73.3	36	80.0	9	20.0	28.00	0.000**
Blood pressure	13	28.9	32	71.1	34	75.5	11	24.5	28.00	0.000**
Side effects of bilisphere phototherapy	8	**17.8**	37	82.2	42	**93.3**	3	6.7	29.00	0.000**

(**) Highly statistical significant at P ≤ 0.001

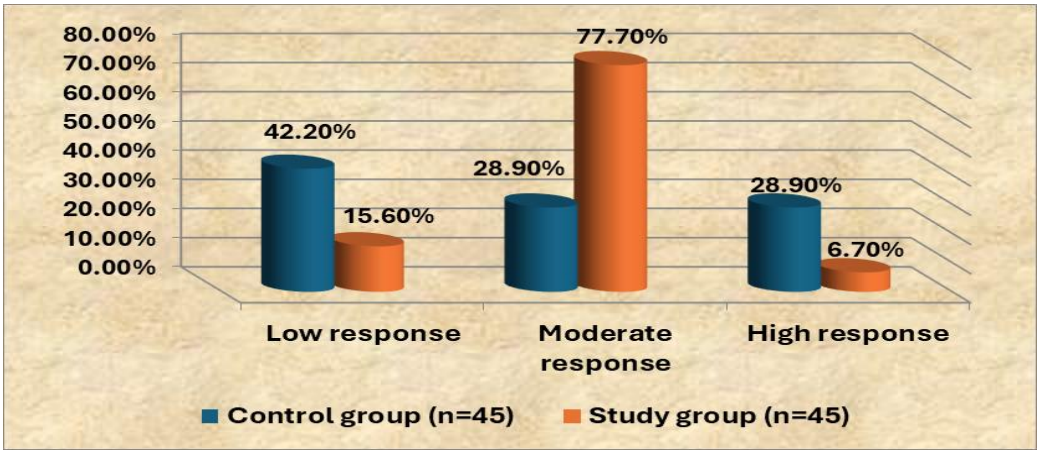

Figure (5): Total score of neonates' reflexes in the control and study groups "n=90"

Table (2): Correlation between the nurses' knowledge of bilisphere and general practice before and after the education program "n=60"

Variables	Total practice			
	Before- implementing education program (n= 60)		After- implementing education program (n=60)	
	R	p-value	r	p-value
Total knowledge	0.377	0.000**	0.019	0.902

(**) Correlation is significant at the 0.01 level [2- tailed].

Table (3): Correlation between study group neonates' results and nurses' overall knowledge and practice following the implementation of an education program

Neonates' outcomes	Nurses' total knowledge		Nurses' total practice	
	r	P-value	r	P-value
Vital signs	0.445	0.426	0.485	0.001*
Side effects of bilisphere	0.037	0.643	0.788	0.003*
Total score of neonate's reflexes	0.355	0.007*	0.703	0.000**

***A statistical significant at P ≤ 0.05**

****Correlation is highly significant at the 0. 01 level [2- tailed].**

Discussion:

Pathological jaundice presents on the first day of life and should be managed by phototherapy or exchange transfusion to prevent neurological impairment. Bilisphere phototherapy is an innovative model of phototherapy that could be faster and more effective than conventional phototherapy **(El-mazzahy et al., 2024).**

The current study portrayed that, the majority of the studied nurses had less than 10 years' experience. This finding disagreed with **Galala et al., (2023)** who carried out a study about "Nurses performance regarding humanized care of newborn with hyperbilirubinemia" and found that, less than half of the studied nurses had less than 10 years of experience.

Less than half of the studied neonates in the control and study groups were 35 < 37 weeks of gestational age. This finding disagreed with **Kenawi et al., (2020**) whose study entitled "Assessment of behavioral and neurological responses of neonates with jaundice undergoing phototherapy" and reported that, the minority (5.0%) of the studied neonates < 37 weeks of gestational age.

According to nurses' total knowledge regarding pathological jaundice and bilisphere phototherapy (Figure 3), the current study revealed that, more than three quarters of the studied nurses had satisfactory knowledge regarding pathological jaundice and bilisphere phototherapy, after-education program implementation. This finding was in the same line with **Çamur et al., (2024)** who performed a study entitled "The effect of massage and bathing on bilirubin levels in newborns with hyperbilirubinemia" and showed that, the majority of the studied nurses had satisfactory knowledge regarding pathological jaundice and its management after-education program implementation. From the perspective of the researchers, the current education program provides detailed knowledge sessions implemented with colored booklet and different teaching methods and media which improve nurses' understanding.

After putting the education program into place, the majority of nurses had a competent level of overall practice, according to (Figure 4) of the current study. This conclusion was supported by **Aboelmagd & Mohamed (2022)** in a study entitled, "Effect of applying aluminum foil reflector during phototherapy combined with nursing care on neonatal hyperbilirubinemia," who found that most of the nurses in the study had a competent level of practice after the intervention program was put into place. From the researchers point of view, the response was positive by the nurses

to the education program and this indicates that the program was effective and useful in developing nurses' practices.

In terms of the medical evaluation of newborns, the study and control groups differed significantly (P≤ 0.000) in terms of bilisphere phototherapy adverse effects. This outcome was consistent with a study by **Demirel et al., (2024)** titled "Continuous versus intermittent phototherapy in treatment of neonatal jaundice," which found that the incidence of dehydration and hyperthermia increased significantly during the phototherapy group (p = 0.03). From the researchers point of view, bilisphere phototherapy had severe side effects as a result of its intensive light, but with nurses' competent practice which provided in the study group after- program implementation bilisphere side effects are controlled and minimized.

Concerning total score of neonates' reflexes, the current study revealed that, more than two fifth of neonates had low response in the control group. This result was in the same line with **Avanesova, (2021)** who conducted doctoral dissertation entitled "Treatment and nursing care in newborn hyperbilirubinemia" and ensured that, phototherapy had effect on neonate reflexes and almost caused low response. Additionally, the current study was consistent with **Kenawi et al., (2020)** and illustrated that, there were behavioral differences of studied neonates after phototherapy related to their habituation, social interactive, motor response, state organization, state regulation and reflexes which there were statistically significant differences between the neonate's mean of reflexes response before and after phototherapy (P=0.00). From the researchers point of view, neonatal reflexes affected with both bilisphere phototherapy due to its irradiance and affected with pathological jaundice due to hyperbilirubinemia. Additionally, optimal nursing practice towards bilisphere phototherapy post-program implementation with closely observation of neurological status in study group neonates, provides the best neonate outcomes and moderate reflexes.

Regarding the relationship between the nurses' overall practice and knowledge of bilisphere phototherapy, the current study found that there was a positive correlation between nurses' general knowledge and practice of bilisphere phototherapy before and after the education program was put into place. In support of the current study, **Nambinga & Nghitanwa, (2023)** conducted a study titled " Knowledge, attitude and practices of registered nurses regarding neonatal jaundice at the neonatal intensive care unit in a tertiary hospital in Khomas region, Namibia" and found that nurses' overall mean improvement level of knowledge and practices regarding newborn care in phototherapy was highly correlated.

According to results, which shows the correlation between the outcomes of the study group of neonates and the total knowledge and practice of nurses regarding bilisphere phototherapy at the time of after-education program's implementation, the current study found a positive correlation between the two variables. This result was congruous with **Elsaleih et al., (2020)** who showed that there were highly statistically significant positive relationships between nurses' overall knowledge, total practices, and neonatal outcomes. According to the researchers, high-quality neonatal care is provided by nurses who are well-versed in their field and who stay current with professional training.

Conclusion:

Based on the findings of the current study, the research hypotheses were accepted. The education program regarding bilisphere phototherapy was effective in improving nurses' performance and outcomes of neonates with pathological jaundice after-education program implementation compared to before- education program implementation. Meanwhile, the outcomes for neonates and the performance of nurses were positively correlated after- program implementation.

Recommendations:

- Periodical in-service education programs regarding pathological jaundice should be designed and implemented in NICUs to improve nurses' knowledge based on nurse's actual needs.
- Conducting periodical training courses regarding bilisphere phototherapy should be done to enhance nurses' practice in NICUs at Benha Specialized Pediatric Hospital.
- Future researches should be replicated on a large sample of nurses and neonates in different settings which are needed for generalization of the obtained results.

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تأثير برنامج تعليمي عن العلاج الضوئي بالكبسولة على أداء الممرضين ونواتج حديثي الولادة المصابين بالصفراء المرضية

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الصفراء المرضية هى مرض منتشر بكثرة بين الأطفال حديثي الولادة فهى تنتج من إرتفاع مستوى البيليروبين بالدم. ومع إرتفاع مستويات البيليروبين في الجسم، فإنه يميل إلى الترسب في الأنسجة. يعد العلاج بالكبسولة الضوئية طريقة جديدة لعلاج الصفراء المرضية حيث تعتبر تقنية متعددة الإتجاهات، يتم وضع حديثي الولادة على سرير من الشاش معلق على طول منتصف الكبسولة فتسمح بتعرض سطح جلد الطفل كاملاً للضوء. يلعب تمريض حديث الولادة دورا هاما فى اكتشاف حديثى الولادة المعرضين للخطر, وزيادة وعى الوالدين وتوفير الرعاية التمريضية لحديثى الولادة المصابين بالصفراء المرضية. **الهدف من الدراسة**: تقييم تأثير برنامج تعليمي عن العلاج الضوئي بالكبسولة على أداء الممرضين ونواتج حديثي الولادة المصابين بالصفراء المرضية. **تصميم البحث:** تم استخدام التصميم شبه التجريبي. **مكان إجراء الدراسة:** وحدة العناية المركزة للأطفال حديثى الولادة (الحضانات) بمستشفى الاطفال التخصصى ببنها. **عينة الدراسة:** عينة ملائمة (٦٠) من الممرضين وعينة غرضية (٩٠) من الأطفال حديثي الولادة المصابين بالصفراء المرضية. **أدوات جمع البيانات: الأداة الأولى:** إستمارة إستبيان للممرضين وتشمل أربعة أجزاء: أ- خصائص الممرضين, ب- خصائص حديثي الولادة, ج- معلومات الممرضين عن الصفراء المرضية, د- معلومات الممرضين عن الكبسولة الضوئية, **الأداة الثانية:** قائمة ملاحظة لتقييم ممارسات الممرضين, **الأداة الثالثة**: إستمارة تقييم نواتج حديثي الولادة. **نتائج الدراسة:** الأغلبية من الممرضين الذين شملتهم الدراسة كانت معلوماتهم مرضية وممارساتهم كفء فيما يتعلق بالصفراء المرضية والعلاج الضوئى بالكبسولة بعد تنفيذ البرنامج التعليمى. **الاستنتاج:** كان البرنامج التعليمي المتعلق بالعلاج الضوئي بالكبسولة فعالاً في تحسين أداء الممرضين ونواتج الأطفال حديثي الولادة المصابين بالصفراء المرضية بعد تطبيق البرنامج بالمقارنة قبل تطبيقه. **التوصيات:** تصميم وتنفيذ برامج التعليم الدورية فيما يتعلق بالصفراء المرضية في وحدات العناية المركزة لحديثي الولادة لتحسين معلومات وممارسات الممرضين بناءً على إحتياجاتهم الفعلية.