



EFFECT OF INSTRUCTIONAL MODULE ON KNOWLEDGE AND ITS MANAGEMENT OF NEONATAL JAUNDICE AMONG NURSES IN PEDIATRIC UNIT OF TWO SELECTED TERTIARY HOSPITALS, OGUN STATE

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ABSTRACT: The neonatal period is crucial to the survival of any newborn. In the absence of adequate and prompt management, neonatal jaundice (NNJ) can lead to acute or moderate bilirubin encephalopathy, physical impairments, mental retardation and even death. Nurses play crucial roles in the care of neonates and thus will be in advantage position to curb many death in neonates, continuing education is paramount in rendering nursing care, hence this study aimed to evaluate the effect of an instructional module on knowledge and its management of NNJ among Nurses working in two selected tertiary hospitals in Ogun State. The study utilized a one-group pre-test post-test quasi experimental design. Total enumeration of 76 nurses working in the two hospitals constituted the sample size. Two instruments were used to collect data. A Self-Develop Questionnaire (SDQ) was used to collect demographic data while a Test Paper on Knowledge and Management of Neonatal Jaundice (TP-KMNNJ) was used to collect pre and post intervention data from the participants. Instructional module on knowledge and management of neonatal jaundice was implemented after pre intervention data collection. Content validity of the instruments was ascertained by presenting it to experts in the field. Reliability of the questionnaire was determined using Cronbach Alpha which yielded a co-efficient alpha of 0.71. Data were processed using Statistical Package of Social Science (SPSS) version 23. Descriptive statistics was used to provide answers to the two research questions while inferential statistics of t-test was used to provide answers for the four hypotheses of the study at 0.05 level of significance. Findings showed that majority of the participants 40(60%) were between the ages of 26-30 years, 50(72.5%) were Registered Nurses and Midwives, only 12(17.4%) were Registered Pediatric Nurses. The pre and post intervention mean score of the participants on knowledge of NNJ were (14.83±5.81) and (20.43±4.23) with a mean gain of 5.60. The pre and post intervention mean scores on management of NNJ were (15.79±4.99) and (22.01±3.88) with a mean gain of 6.22. There were significant differences between pre and post intervention mean scores on knowledge of NNJ ($p=0.00$); pre and post mean scores on management of NNJ among participants ($p=0.00$). There were no significant differences between pre intervention mean score of the participants on knowledge of NNJ in the two hospitals ($p=0.14$); post intervention mean score of the participants on management of NNJ in the two hospitals ($p=0.11$). In conclusion, the instructional module enhanced the knowledge and management of NNJ among participants of the study. There were significant differences in the pre and post mean scores of knowledge and management among participants in the two hospitals. Therefore, it was recommended that Nursing Departments should regularly expose nurses to training programs on NNJ, its prevention, risk factors and management through continuing education to improve the quality of nursing care for neonates.

KEYWORDS: Effect, Instructional Module, Knowledge, Management, Neonatal Jaundice



INTRODUCTION

The neonatal period is crucial to the survival of any newborn. Being healthy and staying at it depends extensively in terms of how problems that can complicate the neonatal period are managed. There are various health problems that may affect the neonatal period such as neonatal sepsis, asphyxia, pneumonia but neonatal jaundice is one of the deadliest conditions that progress to severe complications and eventually death. Two third of neonates develop clinically evident indirect hyperbilirubinemia in the first few days of life making it the most common clinical conditions in the newborn that requires evaluation and prompt management (Ahmed & Hani, 2017). Neonatal jaundice is a condition that affects one in two infants globally due to excessive level of accumulated bilirubin in the blood (hyperbilirubinemia) which could be due to physiological or pathological processes and is characterized by a yellowish discoloration of the skin, sclera, mucous membranes and nails (Brits, Adendorff, Huisamen, *et al*, 2018). This condition is most common in newborn and it requires prompt medical attention to avoid serial neurological damages. About 25-30% of the condition is seen in term newborn and a much higher percentage in preterm babies (Bhutani, Zipursky, Blencowe, Khanna, Sgro&Ebbesen, 2013).

Most neonatal jaundice are physiological and can resolved within two weeks without treatment, however, the diagnosis of physiological jaundice is retrospective due to the fact that often times jaundice can start with bilirubin in the physiologic range and then escalate to prolong jaundice resulting in serial complications like cholestasis, acute bilirubin encephalopathy, cerebral palsy, lifelong neurological damages in neonates who survive kernicterus, visual and hearing impairment, mental and physical retardation. Physiological jaundice is caused by combinations of increased bilirubin production in the blood due to accelerated destruction of erythrocytes, decreased excretion of bilirubin and incompetent activity of the bilirubin-conjugating enzyme uridine diphosphoglucurononyltransferase (UDPGT) while pathological jaundice is basically due to a disease process such as sepsis, rhesus incompatibility, hemolytic anemia, polycythemia and bruising accompanying with a dysfunctional bilirubin mechanism. Other risk factors may include; prematurity, low birth weight, infants with diabetic mothers, congenital infection, glucose-6-phosphate deficiency (G-6PD), genetics and familial risk, high altitudes and inadequate feeding.

Neonatal Jaundice a common cause of child morbidity in newborn and the most common reason for readmitting infant to the hospital in the first week of life. Inadequate management has often led to significant bilirubin-induced neurologic damages and mortality. A study estimated that significant neonatal hyperbilirubinemia (SNH) accounted for 1 out of every 5 neonates that were admitted and SNH accounts for at least 5% of all neonatal mortality in Nigeria, this shows the burden of neonatal jaundice in a largely resource poor hospital settings (Nigerian Society of Neonatal Medicine, 2013).

In spite preventive measures during gestational and delivery period to curb neonatal jaundice is still observed that neonatal jaundice remains a major concern that is associated with a rise in morbidity, mortality and increase health care cost. According to Swapna, Revathi, Subhashin, Arundhathi and Indira (2017), neonatal jaundice considered as one of the major public health problems not only in developed countries but also in the developing countries and it is recognized as the leading cause of mortality and morbidity in many developing countries. According to WHO (2012), Nigeria is a major contributor to global neonatal mortality rate and neonatal hyperbilirubinemia is one of the major condition responsible for a



high national neonatal mortality rate of 77% as against world average of 49.4%. The standard practice required in the management of neonatal jaundice is not usually seen especially during phototherapy and exchange blood transfusion (Olusanya *et al*, 2016). A survey conducted in 2013 by Nigerian Society of Neonatal Medicine (NISONM) estimated that significant neonatal hyperbilirubinemia (SNH) accounted for 1 out of every 5 neonates that were admitted and data also suggests that SNH accounts for at least 5% of all neonatal mortality in Nigeria.

Severe neonatal jaundice is 100-fold more frequent in Nigeria than in industrialized countries (Adebami, 2011; Onyearugha, Onyiri&Ugbonma, 2016). Acute bilirubin encephalopathy (ABE) is also very common in Nigeria. It is known that missed diagnosis of jaundice, trivializing all cases of neonatal jaundice, poor monitoring, prescriptions of wrong and ineffective medications for jaundice has been found responsible for the persistence of acute bilirubin encephalopathy and cerebral palsy in the sub region (Olusanya, Osibanjo, Mabogunle, Slusher and Olowe, 2016; Adebami, 2015b). Among the babies who presented late with acute bilirubin encephalopathy in a teaching hospital, about 80% were seen by at least a health worker 24 hour before the brain damage and were given ineffective prescription, wrong counsel and reassurance (Adebami, 2011, 2015b; Egube, Ofili, Isara, &Onakewhor, 2013).

According to the ward record, there has been an increase of patient with neonatal jaundice in Babcock University Teaching Hospital (BUTH) within the past five years. According to the ward records in neonatal units it reveals that from September, 2015 to November, 2018; 628 neonates were admitted and 201(32%) were diagnosed and managed for neonatal jaundice while in Federal Medical Center (FMC) Abeokuta from September, 2015 to November, 2018; 722 neonates were admitted and 254 (35%) were diagnosed and managed for neonatal jaundice. In the absence of adequate and prompt management, neonatal jaundice can lead to acute or moderate bilirubin encephalopathy, kernicterus, mental retardation and even death Onyearugha, Onyiri and Ugbonma, (2016).

Likewise, the researcher through clinical experience has observed delay in reduced bilirubin level of neonates undergoing management of jaundice. These may be attributed to low knowledge on management concerning care given during phototherapy, exchange blood transfusion among nurses or a gap in continuing education training programs offered to nurses on the management of neonatal jaundice. It is on these bases that the study to determine the effectiveness of an instructional module on knowledge and management of neonatal jaundice among nurses in neonatal units is being carried out.

Hypotheses

The following hypotheses are tested:

H₁: There is a significant difference in the pre and post intervention mean score on knowledge of neonatal jaundice among the participants.

H₂: There is a significant difference in the pre and post intervention mean score on management of neonatal jaundice among the participants.

H₃: There is a significant difference in the pre intervention mean scores of the participants on knowledge of neonatal jaundice in the two hospitals.



H₄: There is a significant difference in the post intervention mean scores of the participants on management of neonatal jaundice in the two hospitals.

Theoretical Framework (Bloom's Taxonomy Learning Domain)

Bloom's taxonomy is a set of three hierarchical model which is used to classify educational learning objectives into levels based on complexity and specificity which promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. The framework covers the learning objectives in cognitive, affective, and psychomotor domains.

The model was named after Benjamin Bloom a psychologist in 1956, who was the chairman of the committee of educators that devised the taxonomy. Benjamin Bloom in collaborations with David Krathwohl, Edward Furst, Walter Hill, and Max Englehart published the framework with the aim of categorizing educational goals, and for generations it has been applied by lecturers, teachers and college instructors in their teaching pattern.

The model serves as the backbone for many teaching philosophies, specifically to those that concentrate more towards skills rather than content. The framework consists of three domains in different strata of learning which are; Cognitive, Affective and Psychomotor. For the purpose of this research the cognitive domain was utilized.

Cognitive Domain

This domain is specialized in Knowledge and comprehension which involves critical thinking on a particular subject. It is further classified into six major categories, which are; knowledge, comprehension, application, analysis, synthesis, and evaluation.

However, Bloom's taxonomy model, the cognitive domain which is also in six strata has been updated to account for 21st century needs which are; remembering, understanding, applying, analyzing, evaluating, and creating.

Remember: this has to do with recognizing or remembering facts, basic concepts, terms, or answers, without necessarily understanding their meaning.

Understand: this has to do with the process of understanding concepts such that an individual knows what is being communicated, and the individual can make use of the idea or material being communicated without necessarily relating it to other material or experiencing its implications in the fullest.

Evaluation: this has to do with the process of understanding concepts such that an individual knows what is being communicated, and the individual can make use of the idea or meaning of what is being communicated.

Conceptual Model

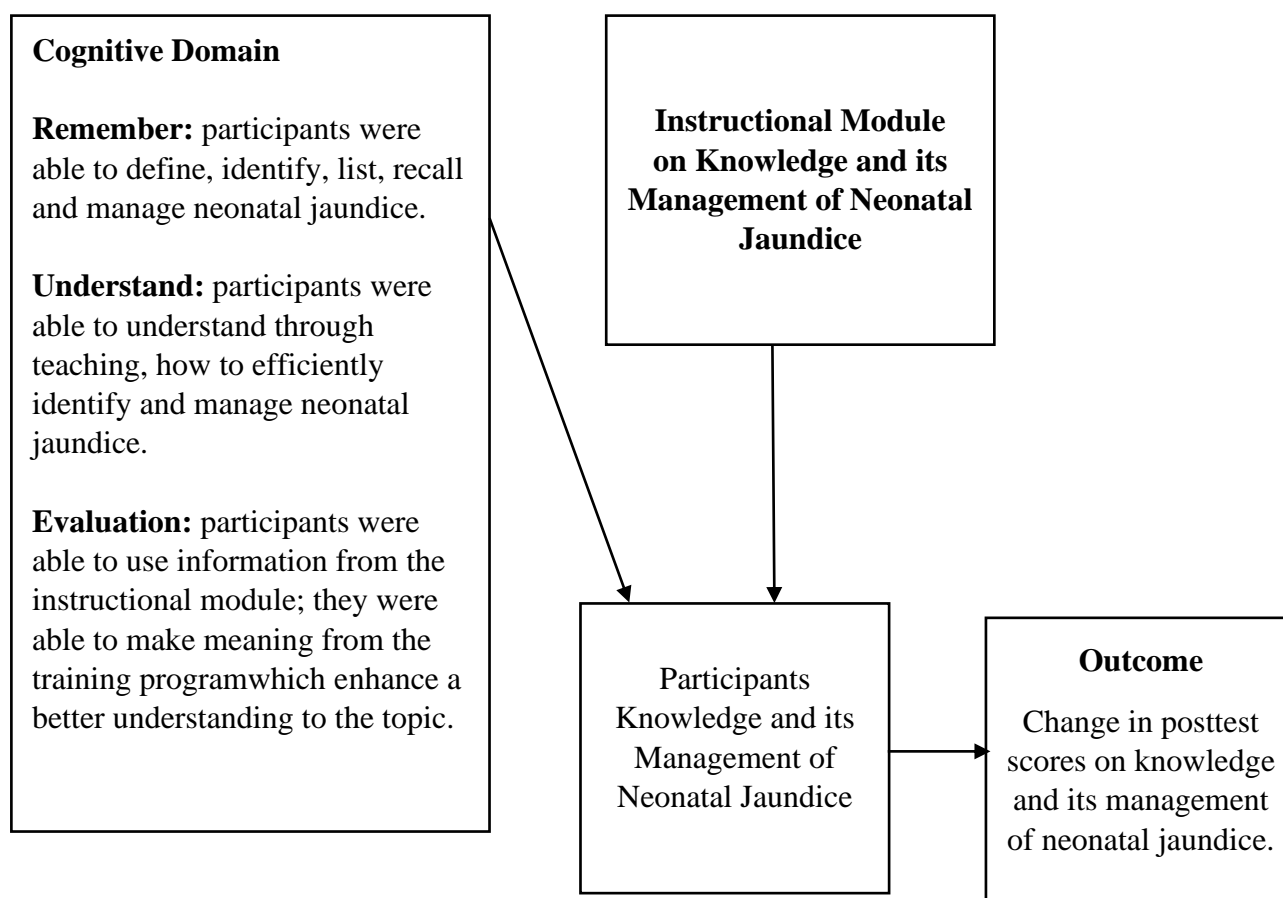


Figure 1: Conceptual Model, adapted from Benjamin Bloom (1956) Learning Domain

Application to the Study

The cognitive domain is a reflection of mental skills or knowledge and comprehension which involves critical thinking on a particular subject. It is further classified into six major categories for nurses to follow a process to update and utilize the knowledge gained through health education on neonatal jaundice and instructional module on management of neonatal jaundice. Based on the construct of the model, if a nurse perceives a neonate being susceptible to having jaundice the nurse is more likely to initiate prompt intervention that will prevent occurrence.

In a situation where there is presence of jaundice in a patient the nurse is likely to initiate prompt intervention, adequate management and to initiates strategies to prevent complications. Remembering deals with recalling facts, realizing that having knowledge of signs of neonatal jaundice, understanding and applying it can help identify neonates with the traits and initiating prompt intervention can influence the outcome of neonates with jaundice in a positive way. Understanding deals with the fact that nurses will be able to comprehend through teaching, how to efficiently and effectively identify and manage neonatal jaundice.



Evaluation participants were able to use information from the instructional module, they were able to make meaning from the training program which enhance a better understanding to the topic.

METHODOLOGY

Research Design: The research design for this study is a one group pre-test post-test quasi-experimental design. The design gave the researcher the opportunity to compare the responses of participants in the groups and assess the effectiveness of the intervention.

Population: The population comprises of 76 nurses both in the experimental groups. The experimental group A consist of 25 nurses while the experimental group B consist of 44 nurses. The study utilized nurses in neonatal units, children emergency and pediatric units in BUTH and FMC all in total of 69 participants.

Inclusion Criteria: Nurses working in neonatal units, children emergency and pediatric units of the two hospitals.

Exclusion Criteria: Nurses on leave at the time of data collection.

Sample size and Sampling Technique: The total enumeration method was used to select the sample size for the research, as the nurses in this study are of small size and they share similar characteristics of interest to the researcher. Through balloting the experimental groups were selected, a total number of 76nurses (25 nurses from the experimental group A and 51nurses from the experimental group B) were included in this study as the sample size as these number represents the total number of all nurses working only in the identified wards. Total enumeration was utilized for this study to select all nurses in neonatal/pediatric units from BUTH (25 nurses) and FMC (44 nurses).

Instrumentation: A structured test paper in three sections was used to gather data for the study. Section A: Self-Develop Questionnaire (SDQ) was used to collect demographic variables of participants. Section B: Test Paper on Knowledge and Management of Neonatal Jaundice (TP-KMNNJ) which comprises of definition, assessments, causes, manifestation and identification of risk factors. The right responses were scored 1 while the wrong response scored 0, maximum obtainable score is 22scores between 0-10 is regarded as below average knowledge, scores between 11-16 is regarded as average knowledge and scores between 17-22 is regarded as above average knowledge. Section C: Test Paper on Knowledge and Management of Neonatal Jaundice (TP-KMNNJ) which contains knowledge about management of neonatal jaundice. The right responses were scored 1 while the wrong response scored 0, maximum obtainable score is 24 scores between 0-11 is regarded as below average knowledge, scores between 12-18 is regarded as average knowledge and scores between 19-24 is regarded as above average.

Reliability and Validity of Instruments: The research instruments, objectives of the study, research question and the instructional module package was submitted to the research's supervisor for content validation. The reliability of the instruments was ascertained at Olabisi Onabanjo University Teaching Hospital. The instrument was pre tested on 10 nurses and Cronbach's Alpha Coefficient was used to establish reliability with a value of 0.71.



Method of Data Collection: A letter of introduction was collected from the School of Nursing Science, Babcock University, Ilesha Remo, Ogun State. The clearance letter was presented to the Department of Nursing Services of the two hospitals who introduced the researcher to the Continuing Education Units and to the various Heads of Units of the selected wards. The researcher met with the research participants at Babcock University Teaching Hospital and Federal Medical Center for 4 visits to train and obtain data.

Data collection was in three major sessions which include:

Pre intervention session: 1st visit: this phase involved meeting with the Chief Medical Directors and Head of Nursing Service for formal permission to utilize the hospital and arrangements of subsequent visits with the Heads of Units in the two hospitals separately. The Head of the Units were met during their meeting days as it was agreed on by the researcher and the participants. The researcher familiarized and got acquainted with the participants and good rapport was established. The objective of the research was explained to them and they were informed that the study would cover three sections, they were assured of confidentiality and that all information provided would be used only for academic purpose and that they were free to withdraw at any stage of the research work without it having any negative implication on them.

Intervention session: The objectives of this session is to pre-test and expose the participants to the teaching module on knowledge and management of neonatal jaundice. The participants were exposed to two days training program. 2nd visit: consent was obtained from the participants in the two experimental groups after which the participants were asked to complete a structure questionnaire. Internet access, interaction and reference materials was not allowed during data collection to avoid external assistance in answering the questions. The researcher stayed with the participants throughout the period of completing the questionnaire and completed questionnaires were checked thoroughly to ensure it is properly completed before retrieval from participants. The participants began their 2days training package on knowledge and management of neonatal jaundice with knowledge of neonatal jaundice as the first module. 3rd visit: health education intervention on management of neonatal jaundice was given and the protocol on phototherapy was introduced.

Post intervention session: 4th visit: two weeks after the intervention, administration of posttest was carried out to determine the participant's knowledge and management of neonatal jaundice. The post test was carried out on the participants using the same instruments.

Method of Data Analysis: Information retrieved at the end of the study were coded and statistical analysis was performed via statistical package for social sciences (SPSS) version 23. The descriptive statistics includes the use of frequency counts, percentage, mean, median and standard deviation which was used to answer the research questions. T-test was used by the researcher to test the hypothesis at 0.05 level to know the difference between the mean scores of the experimental group.

Ethical Consideration: Ethical clearance was sought from Babcock University Health Research and Ethics Committee to conduct the study, an introductory letter was collected from the Department of Nursing Science, Babcock University Ilesha Remo, Ogun State. A



formal permission to utilize the hospital from the Director of Nursing Services and Heads of neonatal Units was obtained, informed consent was gained through verbal interaction with the participants and they had the right to withdraw from the study at any time without penalty. Confidentiality of the participants as well as the information provided was guaranteed by the researcher.

RESULTS AND DISCUSSION

Table 1: Participants' Demographic Data

SN	Variable		Frequency	%
1	Age	20-25years	4	5.8
		26-30 years	40	60.0
		31-35 years	20	29.0
		36 years above	5	7.2
		Total	69	100.0
		Mean age = 29.7, SD = 5.92		
2	Marital Status	Single	30	43.5
		Married	36	52.2
		Divorced	1	1.4
		Widowed	2	2.9
		Total	69	100.0
3	Professional Qual.	RN, RPN	12	17.4
		RN, RM, BNSC	6	8.7
		RN, RM, RPN	1	1.4
		RN, RM	50	72.5
		Total	69	100.0
4	Work Experience	1 - 5years	49	71.0
		6 - 10years	13	18.8
		11 - 15years	4	5.8
		16years and above	3	4.4
		Total	69	100.0

Source: Researcher's Field Report 2020

The demographic distribution of the respondents as presented in Table 1 above shows that 40 (60%) of the respondents are between the age of 26-30 years while 20 (29.0%), 5 (7.2%) and 4 (5.8%) of the respondents falls in the age categories of 31-35 years, 36 years and above and 20 – 25 years respectively. The marital status of the respondents revealed that 36 (52.2%) of the respondents were married while 30 (43.5%), 2 (2.9%) and 1(1.4%) of the respondents are single, widowed and divorced respectively. The professional qualifications of the respondents as presented in the table showed that 50 (72.5%) possessed (RN, RM) while 12 (17.4%), 6 (8.7%) and 1 (1.4%) have (RN, RPN), (RN, RM, BNSC) and (RN, RM,RPN) respectively. It can also be seen that the work experience of the respondents showed that 49 (71.0%) have 1-5years work experience while 13 (18.8%), 4 (5.8%) and 3 (4.4%) have 6-10 years, 11- 15 years and 16 years & above work experience respectively.



Table 2: Independent t-test to shows the difference in the pre and post intervention mean score on knowledge of neonatal jaundice among participants

	N	Mean	Std. Deviation	Std. Error Mean	df	T	Mean diff	Sig
PRE	69	12.91	3.66	.42				
POST	69	20.45	1.33	.16	136	5.27	2.46	.00

Table 2 represents the result of hypothesis one postulated in this study. It is indicated that there is a significant difference in the pre and post intervention mean score on knowledge of neonatal jaundice among nurses in the experimental groups. This is justified by the significant value of 0.00 which is less than the significant threshold of 0.05. Based on this, the null hypothesis cannot be accepted.

The outcome of this study was statistically proven that there is a significant difference between the pre and post intervention mean score on knowledge of neonatal jaundice among participants in the experimental group. This corroborates with findings of Ogunlesi & Abdul (2015), who affirmed that there is a significant difference in the pre and post intervention mean score on knowledge of participants on neonatal jaundice as this directly or indirectly contribute to the influence on the respondents.

Table 3: Independent t-test to shows the difference in the pre and post intervention mean score on management of neonatal jaundice among participants

	N	Mean	Std. Deviation	Std. Error Mean	Df	T	Mean diff	Sig
PRE	69	14.88	3.39	.39				
POST	69	22.32	1.12	.14	143	5.98	2.56	.00

Table 3 represents independent t-test to show the difference in the pre and post intervention mean score on management of neonatal jaundice among participants. It is shown from the table that the significant value is 0.00 which is less than the significant threshold of 0.05. The null hypothesis cannot be accepted based on this assertion. The study revealed that there is a significant difference between pre and post intervention mean scores on management of neonatal jaundice among participants in the experimental group. The result attest with the findings of Karale, Mohiteet *al* (2018) who revealed that the planned teaching program with reference to management of neonatal jaundice was an effective method for providing adequate knowledge and to enhance knowledge on application of phototherapy.

Table 4: Independent t-test to shows the difference in the pre intervention mean score on knowledge of neonatal jaundice among participants in the two hospitals

	N	Mean	Std. Deviation	Std. Error Mean	df	t	Mean diff	Sig
BUTH	25	12.24	4.36	0.87				
FMC	44	12.28	310	0.43	74	1.36	0.05	.14



Table 4 represents the independent t-test to shows the difference in the pre intervention mean score on knowledge of neonatal jaundice among participants. It is indicated that there is no significant difference in the pre intervention mean score on knowledge of neonatal jaundice among the participants. This is justified by the significant value of 0.14 which higher than the critical value of 0.05. Based on this, the null hypothesis cannot be rejected. The results statistically indicated that there is no significant difference between the pre-intervention mean scores on knowledge of neonatal jaundice among the participants in the two hospitals. This was in line with the findings of Khalesi and Rakshani (2008) where it was reported that both the experimental and control groups as regards the knowledge of neonatal jaundice have a similar scores pre interventions. Additionally, Gotink et al, (2013) also reported no significant difference in the pre intervention mean scores of participants in the experimental and control groups on the knowledge of neonatal jaundice.

Table 5: Independent t-test to shows the difference in the post intervention mean score of knowledge on managements of neonatal jaundice among participants in the two hospitals

	N	Mean	Std. Deviation	Std. Error Mean	df	t	Mean diff	Sig
BUTH	25	20.84	1.28	.27				
FMC	44	21.59	0.92	.14	67	2.82	0.75	.11

Table 5 indicates the independent t-test to shows the difference in the post intervention mean score on management of neonatal jaundice among the participants. It is indicated that there is no significant difference in the pre intervention mean score on management of neonatal jaundice among the participants. This is justified by the significant value of 0.11 which higher than the critical value of 0.05. Based on this, the null hypothesis cannot be rejected.

The results of the study statistically revealed that there is no significant difference between the post interventions mean score on management of neonatal jaundice among the participants in the two hospitals. The result of the analysis was clearly in tandem with the results of the study conducted by Akman and Yaprak (2012) where it was also confirmed that there is a significance difference in the post intervention scores of participants on the management of neonatal jaundice. Similar study conducted by Karale, Mohiteet *al* (2018) revealed that the planned teaching program with reference to management of neonatal jaundice was an effective method for providing adequate knowledge and to enhance knowledge on management.

CONCLUSION

The result from this research has validated the effectiveness of providing health education on knowledge and management of neonatal jaundice to nurses as being effective in prompt management of neonatal jaundice. Based on the findings of the study, there was a significant difference in the pre and post intervention mean knowledge scores of neonatal jaundices. Majority of participants in the experimental group had moderate knowledge level and low management level. Effectiveness of instructional module on knowledge and management of neonatal jaundice improves knowledge and management concerning knowledge and



management of neonatal jaundice among nurses as this study achieved a difference in post-intervention mean knowledge and management scores of the experimental group. Hence, the effectiveness of instructional module has significantly improved knowledge and management of neonatal jaundice among nurses.

RECOMMENDATIONS

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

1. establishment of in-service educational program to provide continuous education for nurses working in the neonatal intensive care units NICU aiming to refresh their knowledge, management of neonatal jaundice and for the new assigned nurses to improve their knowledge and practice.
2. continuing health education in the units should be put in place and intentional on cases peculiar to the units as this go a long way in enhancing health services rendered and preventing complications.
3. hospitals should regularly expose nurses to training programs on neonatal health cases and updates on management.
4. hospitals should provide nurses with phototherapy protocols and it should be considered as a tool for identification and management of neonatal jaundice.
5. hospitals should regularly review their protocols and policies on management of neonatal jaundice.
6. nursing curriculum in schools should be revised to include contents on management of neonatal jaundice especially the phototherapy protocol which is necessary to improve knowledge and management concerning neonatal jaundice among nurses.
7. government should review policies and programs aimed at improving knowledge and management of neonatal jaundice among nurses which is necessary to improve knowledge and management of neonatal jaundice among nurses which could enhance the reduction of the rate of infant morbidity and mortality.

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