

Effectiveness of a Self Instructional Module on Phototherapy in Terms of knowledge and Practice among Staff Nurses of a Selected Hospital, Kolkata, West Bengal

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Abstract: *The investigator conducted a pre experimental study to assess the effectiveness of a self instructional module on Phototherapy in terms of knowledge and practice among staff nurses of a selected hospital, Kolkata, West Bengal. Objectives of the study were to assess the knowledge and practice on Phototherapy among staff nurses before and after exposure of Self Instructional Module. She adopted single group pre-test post-test design and selected thirty staff nurses working in newborn care unit for the study. Sampling technique was purposive. The researcher used a valid and reliable structured knowledge questionnaire and observation checklist for data collection. Pilot study showed that the study was feasible and practicable. The investigator conducted final study in selected hospitals of Kolkata and used both differential and inferential statistics to analyze the data. By finding the effectiveness of Self instructional Module the investigator showed that the mean post test knowledge scores and practice scores was apparently higher than the pretest knowledge score and practice score. Therefore the Self Instructional Module was an effective method of improving staff nurses knowledge and practice.*

Keywords: Self Instructional Module, phototherapy, knowledge and practice

1. Introduction

Jaundice in new born babies is a normal event and is not always considered serious. Jaundice comes from the French word “jaune” which means “yellow” when it is said that a baby is jaundiced, it simply means that the colour of the skin appears yellow. The yellow colour is due to bilirubin that is produced when red blood cells get old and are broken down by the body. The normal newborn produced 8.5 ± 2.3 mg bilirubin per kg per day, which is more than double the bilirubin production of 3.6 mg / kg / day in adults (Ghai, 2005)^[1]. Jaundice due to physiological immaturity of newborn babies is seen nearly in 60% of term & 80% of preterm babies. In term babies physiological jaundice appears between 30-72 hours of age. Maximum intensity of jaundice is seen on the 4th day, when serum bilirubin does not exceed 15mg/dl. Due to immaturity of the blood brain barrier hypoproteinemia & perinatal distress factors, brain damage may occur at relatively lower level of serum bilirubin levels^[2]. Among preterm babies, age of onset of physiologic jaundice is similar to the term babies. It may manifest earlier but never before 24 hours of age. The maximum intensity of jaundice is reached on the 5th or 6th day and it may persist up to 14 days. According to Meharban Singh, jaundice is caused due to infection and hypothermia.^[2] Due to immaturity of blood brain barrier, hypoproteinemia and perinatal distress factors, bilirubin brain damage may occur at relatively lower serum bilirubin levels. Phototherapy would preferably be seen to be a safe and efficient method of treatment for all neonates having

hyperbilirubinemia. Jaundice is a common problem in the first week of life. It was a cause of concern for the physician and source of anxiety for the parents. Over 60 percent of term newborns developed jaundice by 48-72 hours of age, of which 5-10 percent need intervention for management of hyperbilirubinemia.^[1]

Awasthi and Rehaman in Lucknow conducted a prospective cohort study among 274 neonates born in North India on Early prediction of neonatal hyperbilirubinemia. The result revealed that hyperbilirubinemia was found in 12.6 percent neonates received phototherapy.^[3] Lawrence Slater from the University of California, San Francisco, conducted a study on effectiveness of phototherapy on 25 term infants and showed that hyperbilirubinemia reduced among infants after the phototherapy.^[4] Castello SA in Australia conducted a comparative study on the use of overhead fluorescent phototherapy units with biliblankets on 44 term infants with birth weight between 800 gms-2500 grams where 24 infants were kept in conventional group and 20 infants were kept biliblanket group respectively and Serum bilirubin level was checked at 12-24 hours after cessation of phototherapy which showed the same mean duration of Phototherapy for both group indicating both methods were effective.^[5] Tatil M.M and Minnet C (2006) in Turkey conducted a study on effectiveness of phototherapy on neonatal hyperbilirubinemia on 33 full term neonates with physiological jaundice. Phototherapy was given with 6 fluorescent lamps producing radiation with wavelength 480-520 nm with 12

microwatt/cm²/nm, total serum bilirubin checked at 24 hrs and at 48 hours of phototherapy which showed a decline in total serum bilirubin level, indicating the effectiveness of phototherapy in treating neonatal hyperbilirubinemia.^[6] The above study focuses on the importance of Phototherapy for the neonates with hyperbilirubinemia where it could be seen that Phototherapy is as effective as other methods like biliblankets to reduce serum bilirubin. But certain side effects may come when the baby is kept under Phototherapy. So we nurses should be careful for care of newborns undergoing Phototherapy.

2. Review of Literature

Komar SM and Szmborski J, Poland conducted an analysis on the side-effect of phototherapy in three groups of new born: in the first group 300 newborns were irradiated by continuous Phototherapy method, in the second group 178 were irradiated by intermittent Phototherapy method and in the third group 118 newborns were treated with exchange transfusion and phototherapy, finding revealed that loose stool was the common side effect due to phototherapy in one third of the newborns.^[7] Stefflensrud S in U.S.A expressed that hyperbilirubinemia is a common problem, affecting 45-60 percent of term infant and up to 80 percent of the premature neonates.^[8] Phototherapy, the standard treatment for neonatal hyperbilirubinemia, is effective but has the potential for adverse effects. Nilgren Nilsson in U.S.A expressed that bilirubin-induced complications can be prevented by instituting a neonatal jaundice protocol to identify infants at risk for significant hyperbilirubinemia, by ensuring adequate parental education and preparedness, and by implementing a good neonatal tracking system for follow-up care. Murphy.^[9] MR and Oellrich RG, New York highlighted that phototherapy was commonly used to treat infants with hyperbilirubinemia which could be given by Conventional phototherapy, kept approximately 20 inches from an infant and also by fibre optic blanket, wraps light around the infants torso and finding revealed the effective decrease in serum bilirubin level with both the methods along with some advantages of fibre optic blanket like infant could remain in the mother's room in an open crib during treatment without the need for eye patches.^[10] Saini, Rajasthan conducted a study among forty staff nurses to develop and evaluate the effectiveness of a self instructional module on management of disaster due to an earthquake in terms of knowledge of staff nurses working in a selected hospital which showed mean gain in knowledge score after administration of Self Instructional Module.^[11] Chandra Kanchan in Kolkata conducted a study to assess the effectiveness of Self Instructional Module on airway management of mechanically ventilated patients for thirty nurses working in the critical care unit of a selected hospital of Kolkata, in terms of their gain in knowledge and skill which revealed that Self Instructional Module was effective in increasing the knowledge and skill of staff nurses on airway management^[12]

3. Materials and Methods

A pre-experimental, with one group pre-test design was used for the study, with the self instructional module as the independent variable and the knowledge and practice of staff nurses regarding phototherapy as dependent variable. Subjects were selected from two government hospitals, West Bengal. Thirty staff nurses working in newborn care unit of selected hospitals of Kolkata, West Bengal were selected by Convenience sampling technique. Ethical clearance was obtained from the institution and permission obtained from medical superintendent. Written consent was obtained from the participants on the study. The staff nurses were told the purpose of the study. Structured knowledge questionnaire was developed by the researcher. Content validity was ascertained from 7 Experts. The reliability was established through test-retest method ($r=0.86$). After obtaining validity and administrative approval try out of the tool was done to check the clarity and practicality of the tool. The tool was tried out on 10 subjects. It was found that the tool were clear, unambiguous feasible and practicable to the population under study. It was found that the knowledge questionnaire took an average of 20 minutes to respond and it was easily understood by them. The investigator conducted the pilot study at N.R.S. Medical College and hospital, Kolkata after getting formal permission from Head of the department, Nursing Superintendent of newborn care unit. Sister incharge of the respective ward was requested to arrange the duties of the staff nurse those who are taking part in the pilot study. The staff nurses working in newborn care unit were selected as the samples of the study. The sample size for pilot study was 10. Informed consent was taken from each respondent for their willingness to take part in the study after discussion of the purpose of the study. Selected personal information was collected from all the respondents along with the knowledge questionnaire. On day 1 Pretest was conducted by administration of a structured knowledge questionnaire and observation of practice of the staff nurses before administration of SIM. On day 2 SIM was administered to the staff nurses. After 7 days same knowledge questionnaire was readministered. Practice of staff nurses observed by the help of same observation checklist. Finally it was found that the study was feasible. The formal administrative permission was taken from the controlling authority to conduct the final study. Sister-in-charge was requested to arrange the duties of the staff nurses in the same ward those who are taking part in the study. Self introduction and establishment of rapport with the nurses was done. Informed consent was taken from each respondent for their willingness to take part in the study. Pretest assessment of practice and knowledge was done on the first day. Self Instructional Module was introduced on the second day. Post test assessment of practice and knowledge was done on seventh day

4. Results

For analysis and interpretation of the data descriptive and inferential statistics were used. Data analyzed for statistical

significance. The Descriptive statistics was used to describe the sample characteristics of staff nurses by frequency and percentage distribution. Inferential statistics was used to infer significance of the means of the pretest and posttest knowledge and practice score by paired 't' test. Correlation between pretest and post test knowledge and practice score was assessed by Pearson's Product Moment Formula. Regarding age of the sample reveal that about (40%) participant belongs to 26-30 years of age. The year of experience reveal that majority (53.3%) participants were having 3-4 years of experience. Educational qualification reveals that all of the participants (100%) have GNM qualification. Most (80%) participants had attended training on newborn care. About 30% of staff nurses had given care to neonates undergoing Phototherapy.

Table 1: Frequency and percentage distribution of staff nurses according to their age, years of experience, educational qualification, attended training on newborn care and care given to neonates undergoing Phototherapy, opinion about care given to neonates undergoing Phototherapy, N=30

Sl. No.	Characteristics	Frequency	Percentage
1	Age		
1.1	21-25 years	3.0	10
1.2	26-30	12	40
1.3	31-35	23.30	23.30
1.4	36-40	23.30	23.30
1.5	41 and above	0.9	3.30
2	Years of Experience		
2.1	0-2 years	-	-
2.2	3-4 years	16	53.3
2.3	5-6 years	10	33.3
2.4	More than 6 years	04	13.3
3	Educational Qualification		
3.1	GNM	30	100
3.2	B.Sc Nursing	-	-
4	Attended training on newborn care by staff nurses		
4.1	Yes	6.0	20
4.2	No	24	80
5	Care given to neonates undergoing Phototherapy by staff nurses		
5.1	yes	30	100

Table 2: Area wise modified gain scores on knowledge level of staff nurses on phototherapy, N=30

Sl. no.	Areas	Max score	Mean pre-test	Mean post-test	Mean possible gain	Mean Actual gain	Mean modified gain
1	Definition	2	1.0	1.8	1.0	0.8	0.8
2	Mode of action	1	0.3	0.9	0.7	0.6	0.8
3	Indication	1	1.0	1.0	0.0	0.0	00
4	Clinical assessment	2	0.6	1.2	1.4	0.6	0.4
5	Types of jaundice	1	0.4	0.7	0.6	0.3	0.5
6	Type of Phototherapy unit	3	0.6	2.1	2.4	1.5	0.6
7	Effectiveness of Phototherapy unit	3	1.1	2.3	1.9	1.2	0.6
8	Management of jaundice	3	2.3	2.5	0.7	0.2	0.3
9	Adverse effect of phototherapy	4	2.8	3.2	1.2	0.4	0.3
10	Contraindication of Phototherapy	1	0.06	0.6	0.94	0.54	0.5
11	Nursing care of neonates	3	2.4	2.8	0.6	0.4	0.7

Table 3: Mean, median, Standard Deviation, 't' value of pre test and post test knowledge scores of staff nurses on phototherapy, N=30

Knowledge score	Maximum Possible score	Mean	Median	MD	SD	't' value
Pre test	24	12.8	13.5		2.7	
Post test	24	19.50	20.5		1.7	

$t_{0.01 (29)} = 2.76, **p < 0.01$

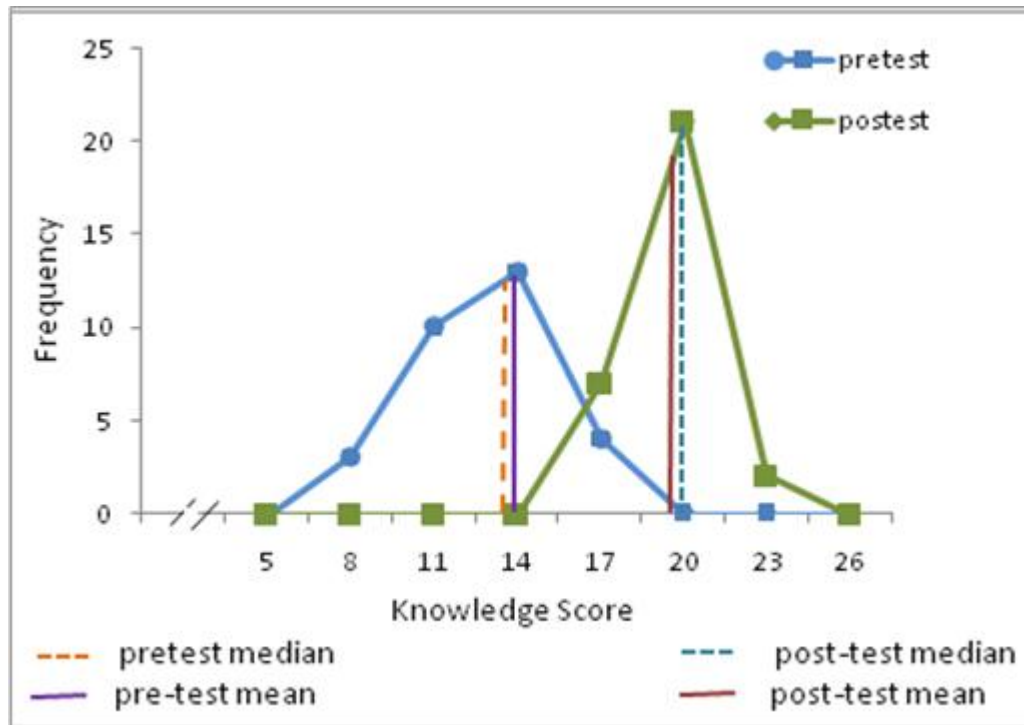


Figure 1: Frequency polygon of pre-test and post-test knowledge score

Table 4: Mean, median, Mean Difference, Standard. Deviation, 't' value of pre test and post test practice scores of staff nurses on phototherapy, N=30

Practice score	Maximum Possible score	Mean	Median	MD	S.D	't' value
Pre test	19	8.4	13.5		1.8	
Post test	19	13.5	17.5		0.8	

$t_{0.01(29)} = 2.76, **p < 0.01$

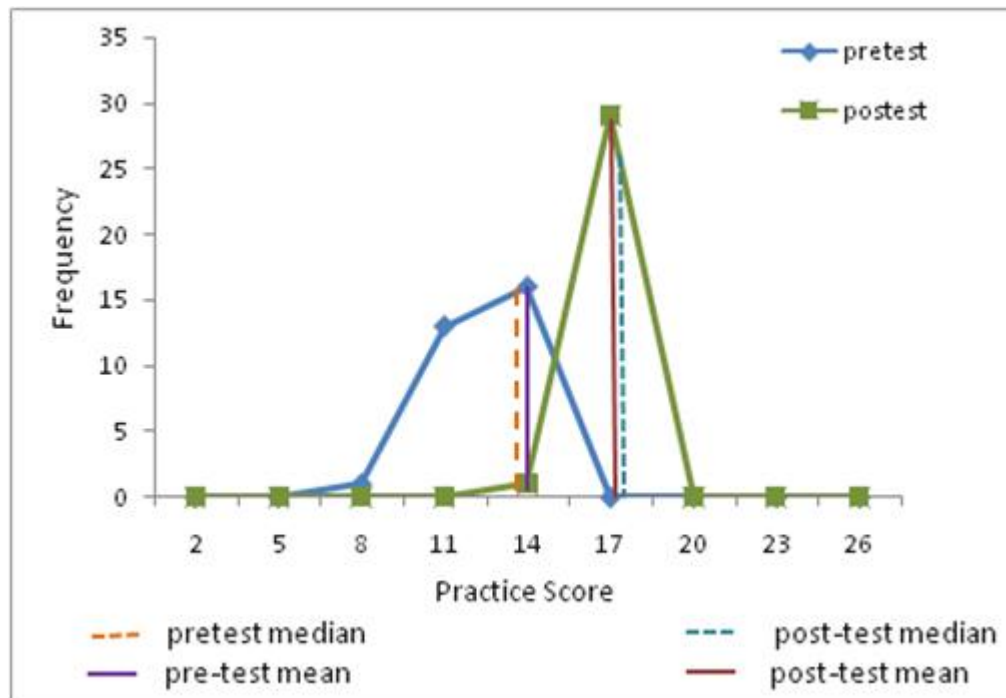


Figure 2: Frequency polygon of pre-test and post-test practice score

Table 5: Correlation coefficient between post-test knowledge and practice scores of staff nurses on phototherapy, N=30

Scores	Mean	r	t'
Post Test Knowledge	19.50	0.7	5.25**
Post Test Practice	16.8		

$t_{0.01(29)}=2.76$, ** $p < 0.01$

5. Discussion

The findings of the study shows that the mean post test knowledge and practice score of the staff nurse is significantly higher than the mean pretest scores after exposure to Self Instructional Module on phototherapy, suggesting the effectiveness of Self Instructional Module in enhancing the knowledge and practice of staff nurse. Area wise modified knowledge gain score shows that maximum modified gain score (0.8) are in area of definition and mode of action and minimum modified gain knowledge score (0.3) are in area of management of jaundice and adverse effect of jaundice. The findings of the study are consistent with the study of Chandra which revealed that there was a significant increase in knowledge scores and practice scores as shown by the statistical differences by pre-test and post-test scores. The present study shows that there was positive and significant correlation between the post test knowledge and post test practice scores of staff nurses on Phototherapy.

The study of Joseph is also consistent with this result. The result revealed positive significant correlation between the post test knowledge and post test practice scores of staff nurses on basic life support. The mean post test knowledge score (45.8) and practice score (24.9) of experimental group were significantly higher than the pre-test knowledge score (29.7) and practice score (13.03) of the control group showing positive relationship between knowledge and practice score of staff nurses on basic life support.

6. Conclusion

The knowledge and practice score of the staff nurses regarding phototherapy were adequate as determined by the area wise gain in knowledge. The Self Instructional Module on phototherapy was found to be effective to enhance the knowledge of the staff nurses. The knowledge and practice of staff nurses were positively correlated to each other.

7. Future Scope

Nurses have very important role to play in early detection, treatment and prevention of diseases. A Self Instructional Module can be a helpful guide for all staff nurses who are new to nursing service or transferred to newborn care unit from any other unit as it is a written guideline. Newborn care nursing is such a field where day to day changes are going on. Old techniques are undergoing changes Therefore Self Instructional Module can help the nurses to keep pace with changed theories and practices and to provide quality care. SIM can be used as a technique / tool / strategy for preparation

of newborn care nurses. . It will also help to initiate appropriate prevention and intervention strategies to meet the need of specific populations. This will be helpful for all categories of staff nurses to have evidence based nursing practice.

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