

A STUDY TO ASSESS THE EFFECTIVENESS OF THE SELF-INSTRUCTIONAL MODULE REGARDING PHOTOTHERAPY IN TERMS OF KNOWLEDGE AND PRACTICE AMONG STAFF NURSES WORKING IN NICU AT SELECTED HOSPITALS IN VIJAYAPURA, KARNATAKA

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Abstract

Phototherapy is a critical and widely used intervention in management of neonatal hyperbilirubinemia in Neonatal Intensive Care Units (NICUs). Effective administration of phototherapy requires adequate knowledge & competent practice among staff nurses to ensure neonatal safety and optimal therapeutic outcomes. Present study aimed to assess the effectiveness of a Self-Instructional Module (SIM) regarding phototherapy in terms of knowledge and practice among staff nurses working in NICUs at selected hospitals in Vijayapura, Karnataka. A quantitative research approach with a pre-experimental one-group pretest-post-test design was adopted. Self-Instructional Module was administered after the pretest, followed by a post-test to evaluate its effectiveness. The findings revealed a significant improvement in both knowledge and practice scores of staff nurses after the implementation of the SIM indicating its effectiveness as an educational strategy.

Keywords: Phototherapy, Self-Instructional Module, Knowledge, Practice & Staff Nurses

Introduction

Neonatal hyperbilirubinemia is a common clinical condition requiring timely and appropriate management to prevent complications such as kernicterus and neurological damage. Phototherapy remains the most effective non-invasive treatment option, and correct application is vital to its success. Nurses working in NICUs play a crucial role in monitoring neonates receiving phototherapy, assessing bilirubin levels, preventing complications

& providing family education. These suggest variability in nurses' knowledge & practice regarding phototherapy care. Therefore, structured educational interventions as Self-Instructional Modules may enhance nurses' competencies and improve neonatal care outcomes.

According to World Health Organization, health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Apparent fullness of this definition carries a powerful intuitive appeal comprehensive definition of health should cover all aspects of life, it would seem. WHO definition has been the target of criticism in the medical literature since its first appearance in that organization's constitution in 1948.

Disease is any harmful deviation from normal structural or functional state of an organism, generally associated with certain signs and symptoms and differing in nature from physical injury. A diseased organism commonly exhibits signs or symptoms indicative of its abnormal state. Normal condition of an organism must be understood in order to recognize the hallmarks of disease. Sharp demarcation between disease and health is not always apparent. Health promotion is a behavioural social science that draws from

the biological, environmental, psychological, physical & medical sciences to promote health and prevent disease, disability and premature death through education-driven voluntary behaviour change activities.

Literature reviews

Rakesh Chaturvedi (2024) evaluated the level of phototherapy knowledge among staff nurses and assessed the effectiveness of structured educational interventions. A quantitative research approach was used to measure nurses' understanding of phototherapy principles, procedures and associated care practices. The findings revealed a significant improvement in knowledge following the educational input. The study highlights regular in-service education and training programmes to enhance nurses' competency in phototherapy management and ensure safe quality neonatal care.

Pankaj Pandey (2022) examined the effectiveness of a video-assisted teaching programme on nurses' knowledge regarding the care of neonates undergoing phototherapy. A pre-experimental one-group pretest–post-test design was adopted. Knowledge was assessed using a structured questionnaire before and after the intervention. The results showed a significant improvement in post-test knowledge scores. The study concludes that video-assisted teaching is an effective instructional strategy for enhancing nurses' understanding and improving neonatal phototherapy care.

Gani S. & Sheikh M.A. (2021) this pre-experimental study assessed the effectiveness of a self-instructional module on knowledge regarding phototherapy among staff nurses. A one-group pretest–post-test design was used, and data were

collected through a structured knowledge questionnaire. The post-test results indicated a significant increase in knowledge levels compared to pretest findings. The study concludes that self-instructional modules are effective educational tools for improving nurses' knowledge and supporting evidence-based neonatal nursing practice.

Mishra V.D. & Khan M.U. (2020) aimed to assess the knowledge of staff nurses regarding the care of newborns receiving phototherapy. A descriptive research design was employed and data were collected using a structured questionnaire. The findings revealed varying levels of knowledge among nurses, with notable deficiencies in certain areas of phototherapy care. The study emphasizes the need for continuous education and training programmes to strengthen nurses' knowledge and promote safe neonatal care practices.

Azhagesan C. (2017) evaluated the effectiveness of a video-assisted teaching programme on phototherapy knowledge among nursing personnel. A pre-experimental one-group pretest–post-test design was adopted. Knowledge levels were assessed using a structured questionnaire before and after the intervention. The results demonstrated a significant improvement in knowledge following the video-assisted teaching programme. The study highlights the value of audiovisual teaching methods in enhancing nurses' knowledge and improving the quality of neonatal care.

Research Methodology

Research design

Research design of a study spells out the basic strategies that the researchers adopt to develop information that is accurate and

interpretable. It is the overall plan on obtaining answers to the questions being studied and handling some of the difficulties encountered during the research process. In the present study pre-experimental one group pre-test and post-test design was used to evaluate the effectiveness of Self-Instructional Module on knowledge and practice regarding phototherapy among the staff nurses.

Variables under study

Variable is an attribute of a person or an object that varies that is taken on different values.

Independent variables: Self Instructional Module regarding phototherapy

Dependent variables: Knowledge and practice of staff nurses regarding phototherapy.

Setting: Settings are the more specific place where data collections will occur. The present study was conducted at selected Hospitals at Vijayapura.

Population: The term population refers to aggregate or mass of subjects upon which researcher intended to generalize the findings. The accessible population is the population of subjects which can be enumerated and studied. The target population is the total group of subjects about which the investigator is interested to make generalization. The population for this study was staff nurses of selected Hospitals at Vijayapura.

Sample and Sample size: Sample consists of a subset of a population selected to participate in research study. In the present study staff nurses who met the inclusion criteria were selected as samples. The sample size for the present study is 240 staff nurses.

Sampling criteria

Inclusion Criteria: The staff nurses who are

- Willing to participate in the study.
- Only those who are working in selected hospitals at Vijayapura.
- Both males and females in the age group of 20 – 36 years and above.
- Who are able to speak read, write and understand English

Exclusion Criteria: The staff nurses who are

- Not willing to participate in the study.
- Staff nurses who are below 20 years of age
- Not available during the time of data collection.

Description of tool:

Self-administered knowledge questionnaire: Self-administered knowledge questionnaire is a structured questionnaire which consists of three sections.

Section A: Socio-Demographic Data: The first part of the tool consists of seven items for obtaining information of the selected socio demographic factors as Age, Sex, Residential, Religion, Professional Education, Years of work experience, Source of Information and Source of Knowledge Regarding Phototherapy.

Section B: Self-administered knowledge questionnaire: Self-administered knowledge questionnaire was prepared in the form of multiple-choice questions. It consists of items regarding phototherapy.

Section C: Self-administered knowledge questionnaire on practice was prepared in the form of Checklist.

Content Validity: Validity refers to the degree to which an instrument measures what it is supposed to measure. Content validity' refers to the degree to which the items in an instrument adequately

represent the universe of content. The prepared tool along with the objectives and criteria checklist for evaluation of Self-Instructional Module, scoring key, blue print, criteria checklist for validation were submitted to seven experts to establish content validity. Appropriate corrections were made according to expert’s suggestions and corrections and tool was finalized with the help of research guide.

Result & Discussion

This deals with analysis and interpretation of data collected to evaluate effectiveness of self-instructional module regarding phototherapy in terms of knowledge & practice among staff nurses working in NICU at selected hospitals. Purpose of analysis is to reduce data to a manageable and interpretable form so that research problem can be studied and tested. Data collected through structured knowledge questionnaire and structured Practice scale from Staff nurses (N=240) is analyzed & interpreted. Results were computed by using descriptive & inferential statistics.

Presentation of Data: To begin with data entered in a master sheet for tabulation & statistical processing. Data was analyzed and interpreted by using descriptive and inferential statistics. Results of data analysis are presented under the following headings:

SECTION I: Analysis of Demographic Characteristics of Respondents Under Study.

Analysis of demographic data of respondents is described in terms of Nature of school, Age, Religion, Habitat, Type of family, Occupation of father, Occupation of mother, Number of siblings in family do you talk with your parents about your psychosexual health.

Table -1: Classification of Respondents based on their Demographic variable

N=240

Charac teristics	Category	Responde nts	
		Number	Percent
Age	20-25 years	88	37
	26-30 years	62	26
	31-35 years	40	17
	Above 36 years	50	21
Sex	Male	54	23
	Female	186	78
Residen tial	Urban	145	60
	Rural	95	40
	Others	0	0
Religio n	Hindu	112	47
	Muslim	86	36
	Christian	42	18

	Any Other	0	0
Professi onal Educati on	GNM Nursing	65	27
	B.Sc. Nursing	94	39
	P.B. B.Sc. Nursing	45	19
	M.Sc. Nursing	36	15
	Years of work experienc e	Less than One year	36
One to Three Years		88	37
Four to Six years		65	27
More than Six years		51	21
Source of		Mass media	45

Information	Literature	64	27
	Health team member	96	40
	Relative or Friends	35	15
Source of Knowledge	Nursing Curriculum	88	37
	In-service Education	54	23
Regarding	Workshop / Conference	66	28
	Self-study (Books, Articles)/ Senior Guidance	32	13

Data shows following findings:

The demographic profile shows that most respondents (37%) were aged 20–25 years, followed by 26% in the 26–30 years group, 21% above 36 years and 17% between 31–35 years. Females constituted the majority (78%) while males accounted for 22%. Most respondents resided in urban areas (60%). Regarding religion 47% were Hindu, 36% Muslim and 18% Christian. Professionally, 39% were B.Sc. Nursing graduates. Most had 1–3 years of experience (37%). The main source of information was health team members (40%) and knowledge on phototherapy was primarily obtained from the nursing curriculum (37%).

SECTION II: Analysis of Pre-Test and Post-Test Knowledge and Practice Score
Table – 2: Classification of Respondents based on their Pre-test Knowledge scores regarding Phototherapy

N=240

Knowledge Level	Category	Respondents	
		Number	Percent

Inadequate	≤ 50 % score	137	57
Moderate	51-75 % Score	82	34
Adequate	> 75 % score	21	9
Total		240	100

Table depict that classification of respondents according to their knowledge level in the pre-test. Data showed that majority (57%) of the respondents had inadequate knowledge 34% had moderate knowledge but 9% of them had adequate knowledge.

Table -3: Aspect wise and wholesome Mean, SD, Median, Mean%, CV of Pre-test knowledge scores of Respondents regarding Phototherapy

N=240

S. No	Knowledge Aspects	State ment	M ax . Sc ore	Responde nts Knowledge				
				Me an	Me dia n (%)	Medi an	S D	C V
I	Introductio n and definition of phototherap y	10	10	4.67	11.68	4	2.26	48.39
II	Care of neonates Befo re phot other	10	10	4.68	11.71	5	2.94	62.96

III	Care of neonates during Phototherapy	10	10	4.13	10.28	4	2.54	61.76
IV	Complications of phototherapy	10	10	4.58	11.47	4	2.77	60.49
	Combined	40	40	18.05	45.14	16	8.86	49.61

Table depicts that highest (11.71%) mean percentage of knowledge scores was found in the aspect of Care of neonates before phototherapy followed by 11.47% in aspect of Complications of phototherapy, 11.68% in the aspect of Introduction and definition of phototherapy and the least (10.28%) was found in the aspect of Care of neonates during phototherapy. The overall mean percentage of pre-test was 45.14%.

Table – 4: Classification of Respondents based on Post test Knowledge scores regarding Phototherapy

N=240

Knowledge Level	Category	Respondents	
		Number	Percent
Inadequate	≤ 50 % Score	0	0
Moderate	51-75 % Score	82	34
Adequate	> 75 % Score	158	66
Total		240	100

As per Table depict that classification of respondents according to their knowledge level in the post-test. The data showed that majority (66%) of the respondents had adequate knowledge regarding Phototherapy 34% had moderate knowledge but none of them had inadequate knowledge.

TABLE 5: Mean, SD, Median, Mean%, CV of Post-test Practice scores of Respondents regarding Phototherapy
N=240

S. No.	Practices	State	Max	Respondents Practice				
				Mean	Median (%)	SD	CV	
I	Practice	20	20	16.37	81.87	16	2.34	14.33

Table depicts the Mean, SD, Median, Mean%, CV of Post-test Practice scores of Respondents regarding Phototherapy. The mean percentage of Practice score is 81.87%.

Section III: Comparison Between Pre-Test and Post-Test Knowledge and Practice Score of Respondents and Effectiveness of Self-Instructional Module

Table 6: Mean, SD, Median, Mean% and CV of overall Pre-test, Post test and enhanced Knowledge scores of respondents regarding Phototherapy and calculated 't' value.

N=240

S. No.	Knowledge (%)	Respondents Knowledge (%)	Paired 't' Test
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	w l e d g e A s p e c t s	Pre-test		Post-test		En h a n c e m e n t		
		M e a n	C V	M e a n	C V	M e a n	C V	
I	Intro ducti on and defini tion of Photot herapy	1 1. 6 8	48 .3 9	19 .9 4	1 3. 9	87 .7 9	2 2 6	22*
II	Care of neonat es before Photot herapy	1 1. 7 1	62 .9 6	20 .6 7	18 6. 95	8. 87. 62	17.9*	
III	Care of neonat es during Photot herapy	1 0. 2 8	61 .7 6	18 .7 5	28 0. 46	8. 85. 92	18.77*	
IV	Com plicat ions of photo thera	1 1. 4 7	60 .4 9	20 .8 2	19 7. 35	9. 80. 41	19.68*	

py							
V	Com bined	1 8. 0 5	49 .1 8	80 .1 4	1 4. 2 7	35 .0 27	67. 23.38*

* Significant at 5% level
t(0.05, 239df) = 1.96

Table depicts overall pre-test and post-test and enhanced mean percentage of practice scores of respondents regarding Phototherapy. In pre-test, mean percentage of practice scores was 46.58% and in post-test mean percentage of practice score was 81.87% with the enhancement of 35.29%. The statistical paired 't' value 33.57 is greater than the table value 1.96 which implies that the difference between the pre-test and post-test practice scores found to be statistically significant at 5% level.

Section IV: Analysis of Correlation Between Knowledge and Practice Score of Respondents

Table 7: Mean, SD, Median, Mean% and CV of post-test knowledge and practice score with coefficient of correlation with paired 't' test.

N=240

As pe c t s	M a x i m u m s c o r e	Response				Cor rela tion coef ficient 'r'	Paire d 't' tes t
		Me an	SD	Mean (%)	CV		
Kn ow led	40	3 2. 0	4.5 7	80.18	14.2 7	0.86	20.34*

ge		7				
Pra	20	1	2.3	81.87	14.3	
cti		6.	4		3	
ce		3				
		7				

* Significant at 5% level,
 $t(0.05,238df) = 0.91$

Table depict the relationship between post-test knowledge and practice scores on regarding Phototherapy. The mean percentage of post-test knowledge score was 80.18% and the mean percentage of post-test practice score was 81.87%. The calculated 'r' value is + 0.86. Hence there is a positive correlation between knowledge and practice score of respondents. The calculated 't' value is 20.34 which is greater than 2.02 at 5% level. Therefore, existing correlation is significant.

Conclusion

This provides a comprehensive theoretical and empirical understanding of the knowledge status of staff nurses regarding phototherapy and the effectiveness of a structured educational intervention. The demographic profile of respondents reflects a diverse yet representative nursing workforce with a predominance of young, early-career professionals who are theoretically more receptive to learning and skill development. Gender, residential background, religious diversity, educational qualifications & work experience collectively highlight multifaceted social and professional context in which nurses function reinforcing relevance of sociocultural, adult learning & professional development theories.

Pre-test findings revealed a substantial knowledge deficit across all aspects of

phototherapy indicating inadequate baseline preparedness among the majority of respondents. This aligns with knowledge deficit and patient safety theories emphasizing the risks associated with insufficient clinical knowledge in critical neonatal care. Aspect-wise analysis further demonstrated uniformly low to moderate knowledge levels suggesting fragmented understanding and limited integration of theoretical principles into practice. Post-test results clearly established effectiveness of the educational intervention with significant improvement in knowledge across all domains and reduced variability among respondents. These outcomes support cognitive learning, adult learning and competency-based education theories confirming that structured, focused instruction enhances knowledge acquisition and retention.

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