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Impact Of Informational Booklet On Knowledge Regarding Phototherapy Among Staff Nurses

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ABSTRACT: Hyperbilirubinemia is a common neonatal condition characterized by elevated levels of bilirubin in the blood, leading to jaundice. If not treated promptly, severe hyperbilirubinemia can cause serious complications, including kernicterus, a type of brain damage that can result in long-term neurological impairments. This study aims to evaluate the effectiveness of informational booklet designed to enhance staff nurses' understanding of hyperbilirubinemia. The research design selected for the study was pre experimental one group pre test post- test design. Sample comprised of 120 staff nurses of selected hospitals of Indore, (M.P.) selected using non probability purposive sampling technique. Structured Knowledge Questionnaire was used to assess the knowledge. The pretest knowledge score was 9.05 ± 2.45 , while the posttest knowledge score was 19.98 ± 2.57 . The difference was found to be statistically significant ('Z' value = 24.62, df=119, p value=0.05, Significant), showing a higher posttest knowledge score, which represents significant gain in knowledge. This study result implies that informational booklet was useful in improving the knowledge of staff nurses' regarding hyperbilirubinemia.

Keywords: Neonatal hyperbilirubinemia, staff nurses

INTRODUCTION

Neonatal hyperbilirubinemia is a common condition affecting a significant number of newborns, often leading to jaundice, characterized by yellowing of the skin and eyes. This condition occurs due to an accumulation of bilirubin, typically when levels exceed 5 mg/dL, a byproduct of the normal breakdown of red blood cells. While mild jaundice is usually not harmful, untreated severe hyperbilirubinemia can result in kernicterus, a form of irreversible brain damage. Proper management is essential to prevent long-term complications, making it a vital focus in neonatal care.

The condition can arise from a variety of causes, including physiological factors such as an increased breakdown of fetal hemoglobin and immature liver function, leading to decreased bilirubin clearance. Pathological causes include hemolytic diseases (e.g., Rh incompatibility), genetic disorders like Gilbert's syndrome, and infections that result in excessive red blood cell destruction.

Phototherapy has been the standard treatment for neonatal hyperbilirubinemia since the late 1950s. This method involves exposing the infant to light of specific wavelengths, which aids in converting bilirubin into a water-soluble form that can be easily excreted by the body. While continuous phototherapy has traditionally been the go-to practice, recent studies suggest that intermittent phototherapy may be just as effective. This study aims to compare the efficacy of continuous versus intermittent phototherapy in lowering bilirubin levels in neonates with hyperbilirubinemia, offering important insights into optimizing treatment strategies.

Phototherapy, also referred to as light therapy, is a non-ionizing treatment utilizing light from the electromagnetic spectrum. It works by converting unconjugated bilirubin in the skin into water-soluble forms, which can then be eliminated through the urine via structural isomerization. The decision to initiate phototherapy depends on factors such as the bilirubin level, rate of increase, the infant's gestational and postnatal age, and the underlying cause of hyperbilirubinemia (Bhutani et al., 2011).

Neonatal hyperbilirubinemia is prevalent worldwide, affecting a significant portion of newborns. Approximately 60% of term infants and 80% of preterm infants experience jaundice within the first week of life (American Academy of Pediatrics, 2004). Severe hyperbilirubinemia, defined as a serum bilirubin level exceeding 20 mg/dL, affects around 10% of neonates globally (Bhutani et al., 2011). The incidence and prevalence of neonatal hyperbilirubinemia vary by region, influenced by genetic factors, healthcare infrastructure, and socioeconomic conditions.

In India, neonatal hyperbilirubinemia is reported to affect between 25% and 70% of newborns, depending on the population and study (Rennie & Burman-Roy, 2015). This variation reflects differences in healthcare access, neonatal care practices, and public health education. A multicentric study in India found that about 40% of neonates develop clinically significant jaundice that requires intervention, with a higher prevalence seen in areas with limited healthcare resources (Kumar et al., 2019).

In Madhya Pradesh, the prevalence of neonatal jaundice is estimated to be approximately 50% among hospital-born neonates, with many presenting with severe hyperbilirubinemia requiring phototherapy or other interventions (Patel et al., 2020). Contributing factors include delays in seeking medical care, lack of awareness, and limited access to specialized neonatal care facilities. This highlights the importance of enhancing neonatal screening, timely intervention, and public health education to reduce complications like kernicterus, which can lead to long-term neurological damage.

Physiological jaundice, occurring in about 60% of all newborns during the second and third days of life, is common in the neonatal period. Around 80% of premature infants experience jaundice during the first week of life. Jaundice is a leading cause of mortality for over 100,000 late-preterm and term newborns worldwide annually.

The prevalence of neonatal hyperbilirubinemia varies significantly across regions. In India, approximately 60-80% of newborns develop some degree of jaundice, with severe hyperbilirubinemia being a common reason for neonatal hospitalization. Recent data suggest that around 10% of neonates in India experience severe hyperbilirubinemia. While figures for Madhya Pradesh align with national statistics, there is limited specific data for the state. Globally, severe hyperbilirubinemia affects about 10% of newborns, with higher rates in areas with poor healthcare access, including regions in sub-Saharan Africa and South Asia (Indian Association of Pediatrics, 2022).

Despite the widespread use of phototherapy, studies show notable gaps in knowledge and practice among nursing staff, which can hinder the effective management of hyperbilirubinemia (Dijk et al., 2011). Research by Afzal et al. (2013) demonstrated that educational booklets significantly improved nursing students' knowledge and skills in managing pediatric conditions. Similarly, structured educational programs on neonatal jaundice and phototherapy have been shown to enhance nurses' knowledge and reduce treatment-related errors (El-Feky & Abd Elmonem, 2017).

Given the crucial role of nurses in neonatal care and the potential benefits of educational interventions, this study aims to evaluate the effectiveness of an informational booklet on phototherapy for hyperbilirubinemia management among staff nurses. By offering targeted educational content, the booklet seeks to address knowledge gaps and improve nurses' competence in managing hyperbilirubinemia through phototherapy.

PROBLEM STATEMENT

A study to assess the effectiveness of informational booklet on knowledge regarding phototherapy among staff nurses working in selected hospitals of Indore (M.P.).

OBJECTIVES OF THE STUDY

1. To assess the pretest knowledge regarding phototherapy among staff nurses.
2. To assess the posttest knowledge regarding phototherapy among staff nurses.
3. To assess the effectiveness of informational booklet on knowledge regarding phototherapy among staff nurses.
4. To find an association between pre-test knowledge with selected socio-demographic variables.

HYPOTHESIS

RH₁ – There will be significant difference between pre-test and post-test knowledge score regarding phototherapy among staff nurses among at the level of $p \leq 0.05$

RH₂ – There will be a significant association of pre-test knowledge score with selected socio-demographical variables at the level of $p \leq 0.05$.

RESEARCH METHODOLOGY

RESEARCH APPROACH: The approach used in the present study was quantitative approach. Quantitative approach most often uses deductive logic, in which researcher start with hypothesis and then collects data which can be used to determine whether empirical evidence to support that hypothesis exists.

RESEARCH DESIGN: The research design selected for the study was pre experimental one group pre test post- test design. It judges the effectiveness of the informational booklet by the difference of staff nurses pre and post test knowledge score regarding phototherapy.

Diagrammatic representation of the design is given below

O₁-----X-----O₂

O₁ : Pre Test

X : Intervention

O₂ : Post Test

SAMPLE & SAMPLING TECHNIQUE: Sample comprised of of 120 staff nurses of selected hospitals of Indore, (M.P.). Non probability purposive sampling technique was used.

CRITERIA FOR THE SELECTION OF THE SAMPLES

Inclusion criteria:-

1. Staff nurses who are working in NICU, PICU and pediatric units of selected hospital, Indore, (M.P.)
2. Staff nurses who are registered nurse and midwife.
3. Staff nurses who are willing to participate.

Exclusion criteria:-

1. Staff nurses who are working in other units than pediatrics
2. Staff nurses who are not willing to participate.
3. Staff nurses who are having less than 1 year

DESCRIPTION OF TOOL

Part A: Part A dealt with demographic data which was used to collect the characteristics of the samples with an instruction to participants to put a tick mark [✓] against the appropriate choice closely representing their answers. It contains 6 items such as age, gender, professional qualification, clinical experience, previous knowledge regarding pediatric patient safety and sources of previous knowledge regarding phototherapy

Part B: A Self-structured knowledge questionnaire with 24 items was constructed to assess the Knowledge of staff nurses regarding phototherapy.

The questionnaire consists of 24 multiple choice questions. A score value of 1 was allotted to each correct response and for wrong response zero was awarded. Thus there were 24 maximum obtainable scores. The level of Knowledge was categorized based on percentage of scores obtained.

SCORING OF TOOL:

Poor	(1-6)
Average	(7-12)
Good	(13-18)
Excellent	(19-24)

VALIDATION AND RELIABILITY OF THE TOOL: The tool was submitted to 8 experts from the field of child health nursing along with the blue print criteria checklist, answer key, module to establish the content validity. The reliability was calculated using test retest method. The tool was found reliable $r = 0.80$ using Karl Pearson formula. The tool found to be clear and understandable.

DATA COLLECTION PROCEDURE: The investigator obtained written permission from the concerned authority prior to the data collection at the schools. Pre test knowledge was assessed using structured knowledge questionnaire to assess the existing knowledge of staff nurses regarding hyperbilirubenemia on the first day. On the same day informational booklet was distributed among the samples and instruction to use informational booklet was explained and the date for the post test was priorly informed to them. Post test knowledge assessment was done using the same questionnaire among the staff nurses after 5 days.

RESULT AND INTERPRETATION**Table No.1 Frequency and percentage distribution of staff nurses according to demographic variables.**

S. No.	Demographic Variable	No.	Percentage
1.	Age		
	a. 21-26 years	32	26.7
	b. 27-32 years	54	45.0
	c. 33-38 years	22	18.3
	d. Above 38 years	12	10.0
2.	Gender		
	a. Male	42	35.0
	b. Female	78	65.0
3.	Professional qualification		
	a. GNM	42	35.0
	b. Post B.Sc.	36	30.0
	c. B.Sc. Nursing	32	26.7
	d. M.Sc. Nursing	10	8.3
4.	Clinical Teaching		
	a. 1-5 years	40	33.3
	b. 6-10 years	52	43.3
	c. Above 10 years	56	23.3
5.	previous knowledge		
	a. Yes	28	23.3
	b. No	92	76.7
6.	Sources of previous knowledge		
	a. In service education	6	5.0
	b. Mass media	4	3.3

c. Class room teaching	18	15.0
d. None	92	76.7

There were 32 (26.7%) staff nurses in the age group 21-26 years, 54 (45.0%) staff nurses were in the age group 27-32 years, while 18.3% staff nurses were in the age group above 33-38 years, above 38 years (10.0%) staff nurses were in the age group above 32 years.

There were 42(35.0%) males and 78 (65.0%) females in the present study. Majority of female found in the study.

There were 42(35.0%) staff nurses were having GNM Diploma certificate, 36 (30.0%) staff nurses were having post B.Sc. Degree, 32 (26.7%) staff nurses were having B.Sc. Nursing degree while 10 (8.3%) staff nurses were having higher M.Sc. Nursing Degree.

In this study 40 (33.3%) staff nurses were having 1-5 years clinical experience, 52 (43.3%) staff nurses were having 6-10 years clinical experience, 28 (23.3%) staff nurses were having above 10 years clinical experience.

There were 28 (23.3%) staff nurses were having previous knowledge regarding pediatric patient safety, 92 (76.7%) were not having previous knowledge regarding pediatric patient safety.

There were 6 (5.0%) staff nurses were attended in service education, 2 (3.3%) staff nurses were attended mass media, 18 (15.0%) staff nurses were having knowledge from classroom teaching while majority of 92 (76.7%) staff nurses were not having previous knowledge from any other sources.

Table No. 2 Comparison of the pretest and posttest knowledge Grade

S. No.	Knowledge grade	Pretest		Posttest	
		No.	%	No.	%
1.	Poor (1-6)	28	23.3	0	0.0
2.	Average (7-12)	92	76.7	0	0.0
3.	Good (13-18)	0	0.0	42	35.0
4.	Excellent (19-24)	0	0.0	78	65.0
	Total	120	100.0	120	100.0

In the pretest, 28 (23.3%) staff nurses got poor knowledge Grade, 92 (76.7%) staff nurses got average knowledge Grade, none of them staff nurses got good knowledge Grade and excellent Grade. In the posttest, 42 (35.0%) staff nurses got good knowledge Grade, 78 (65.0%) staff nurses got excellent knowledge Grade, none of them staff nurses got poor knowledge Grade and average Grade.

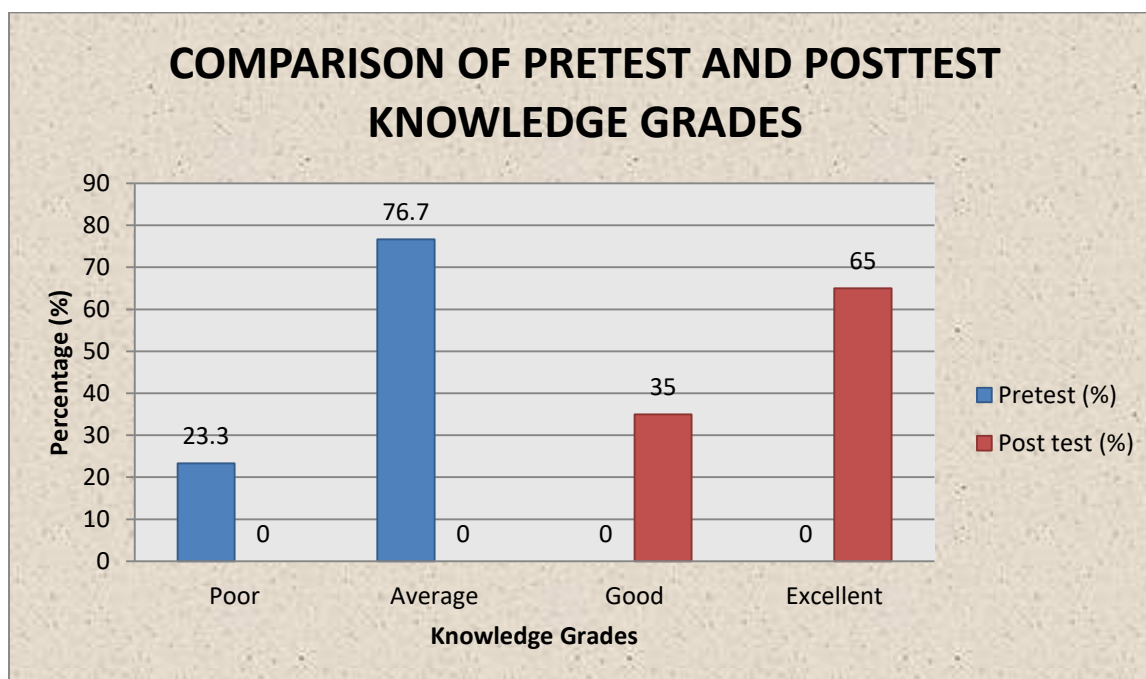


Fig. 1: Bar diagram showing comparison of pretest and posttest knowledge Grade

Table No.3 EFFECTIVENESS OF THE INFORMATIONAL BOOKLET ON KNOWLEDGE OF PRIMARY SCHOOL TEACHERS REGARDING AUTISM SPECTRUM DISORDERS

S. No.	Knowledge Score	Mean \pm SD	'Z' value	p value
1.	Pretest	9.05 \pm 2.45	24.62, df=119	0.05
2.	Posttest	19.98 \pm 2.57		

Paired 'Z' test applied p value =0.05, Significant

The pretest knowledge score was 9.05 \pm 2.45, while the posttest knowledge score was 19.98 \pm 2.57. The difference was found to be statistically significant ('Z' value = 24.62, df=119, p value=0.05, Significant), showing a higher posttest knowledge score.

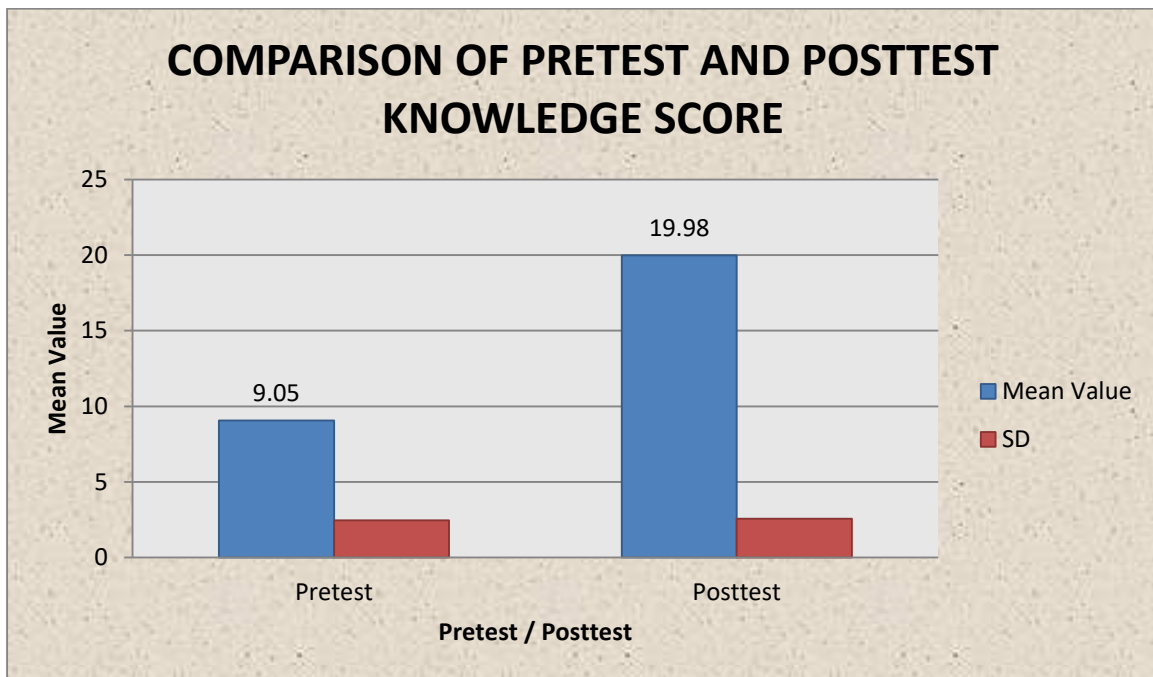


Fig.2: Bar diagram showing comparison of pretest and posttest knowledge score

Table No. 4 Association of pretest knowledge grade with demographic variable

S. No.	Age	Pretest Knowledge grade				χ^2	p value
		Poor (1-6)	Average (7-12)	Good (13-18)	Excellent (19-24)		
1.	Age					0.43, df=3	0.05, NS
	a. 21-26 years	8	24	0	0		
	b. 27-32 years	14	40	0	0		
	c. 33-38 years	4	18	0	0		
	d. Above 38 years	2	10	0	0		
	Total	28	92	0	0		
2.	Gender					0.04, df=1	0.05, NS
	a. Male	10	32	0	0		

	b. Female	18	60	0	0		
	Total	28	92	0	0		
3.	Professional qualification					6.22, df=3	0.05, NS
	a. GNM	6	36	0	0		
	b. Post B.Sc. [N]	8	28	0	0		
	c. B.Sc. Nursing	14	18	0	0		
	d. M.Sc. Nursing	0	10	0	0		
	Total	28	92	0	0		
4.	Clinical experience					10, df=2	0.05, S
	a. 1-5 years	10	30	0	0		
	b. 6-10 years	12	40	0	0		
	c. Above 10 years	6	22	0	0		
	Total	28	92	0	0		
5.	Previous knowledge					0.83, df=1	0.05, NS
	a. Yes	4	24	0	0		
	b. No	24	68	0	0		
	Total	28	92	0	0		
3.	Sources of previous knowledge					2.65, df=3	0.05, NS
	a. In service education	0	6	0	0		
	b. Mass media	2	2	0	0		
	c. Classroom teaching	2	16	0	0		
	d. None	24	68	0	0		
	Total	28	92	0	0		

- ❖ There is a statistically no significant association seen between pretest knowledge grade and the age ($\chi^2=0.43$, $df=3$, p value = 0.05, Not Significant), showing that pretest knowledge grade is independent of the age of the staff nurses.
- ❖ There is a statistically no significant association seen between pretest knowledge grade and the gender ($\chi^2=0.04$, $df=1$, p value = 0.05, Not Significant), showing that pretest knowledge grade is independent of the gender of the staff nurses.
- ❖ There is a statistically no significant association seen between pretest knowledge grade and the professional qualification ($\chi^2=6.22$, $df=3$, p value = >0.05 , Not Significant), showing that pretest knowledge grade is independent of the professional qualification of the staff nurse
- ❖ There is a statistically no significant association seen between pretest knowledge grade and clinical experience ($\chi^2=10$, $df=2$, p value = 0.05, Significant), showing that pretest knowledge grade is independent of the clinical experience of the staff nurses.
- ❖ There is a statistically no significant association seen between pretest knowledge grade and previous knowledge ($\chi^2=0.83$, $df=1$, p value = 0.05), showing that pretest knowledge grade is independent of the previous knowledge of staff nurses.
- ❖ There is a statistically no significant association seen between pretest knowledge grade and the Sources of previous knowledge ($\chi^2=2.65$, $df=3$, p value = 0.05, Not Significant), showing that pretest knowledge grade is independent of the Sources of previous knowledge of the staff nurses.

The above table shows the association of pre-test knowledge score with their selected demographic variables by using chi-square (χ^2), it was evident that there was significant association between pre-test knowledge score with selected socio demographic variable. Thus hypothesis H_2 is accepted.

CONCLUSION

The mean of post-test knowledge scores among staff nurses was 19.98 which is significantly higher than mean of pre-test knowledge scores of 9.05. The computed paired “Z” value (24.62, $df=119$, at the level of $p=0.001$) is greater than table value (1.9) which represents significant gain of knowledge. Thus the “ RH_1 : There will be significant difference between pre test knowledge and post test knowledge score regarding phototherapy among staff nurses at the level of $p \leq 0.05$ is accepted.

It is evident from the results that RH_2 : There will be significant association between the pre test knowledge score and selected demographic variables at the level of $p \leq 0.05$. is accepted as there is significant association between pretest knowledge score and selected demographic variables like years of experience.

From the above results, we can conclude that there was statistically significant gain in knowledge among staff nurses regarding phototherapy. Thus, the intervention “informational booklet” was effective.

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