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

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Abstract
Neonatal hyperbilirubinemia is a common condition that affects a significant number of newborns, often resulting in the yellowing of the skin and eyes, known as jaundice. This condition arises due to the accumulation of bilirubin, a byproduct of the normal breakdown of red blood cells. While mild jaundice is generally harmless, if left untreated, severe hyperbilirubinemia can lead to kernicterus, a form of brain damage. Effective management is crucial to prevent long-term complications, making hyperbilirubinemia a critical focus in neonatal care.
Methodology: The research design adopted for this study was pre experimental one group pre-test-post-test research design and research approach adopted for this was to qualitative approach. The sample were 120 staff nurses. Non probability purposive sampling technique was used.
Result: 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 "RH1: 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 RH2: 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.

Keywords: Polythene utilization, adults, phototherapy

Introduction
Neonatal hyperbilirubinemia is a common condition that affects a significant number of newborns, often resulting in the yellowing of the skin and eyes, known as jaundice. This condition arises due to the accumulation of bilirubin, a byproduct of the normal breakdown of red blood cells. While mild jaundice is generally harmless, if left untreated, severe hyperbilirubinemia can lead to kernicterus, a form of brain damage. Effective management is crucial to prevent long-term complications, making hyperbilirubinemia a critical focus in neonatal care.
Neonatal hyperbilirubinemia is a common condition that often manifests as visible jaundice during the first few days of life. While it is usually benign, in some cases, unconjugated bilirubin can rise to dangerous levels. If not promptly recognized and treated, this can lead to acute bilirubin encephalopathy and, over time, develop into kernicterus spectrum disorder (KSD).
Phototherapy has been the cornerstone treatment for neonatal hyperbilirubinemia for decades. It involves exposing the infant to a specific wavelength of light, which helps convert bilirubin into a form that can be more easily excreted by the body. While continuous phototherapy has traditionally been the standard practice, recent studies suggest that intermittent phototherapy could be equally effective. This study aims to compare the efficacy of continuous versus intermittent phototherapy in reducing bilirubin levels in neonates with hyperbilirubinemia, contributing valuable insights into optimizing treatment protocols.

Phototherapy is the most common form of treatment for jaundice in newborns. The initiation of phototherapy depends on the infant's age and health status, with the general guideline being any newborn with a total serum bilirubin level greater than 359 µmol/L (21 mg/dL) should receive phototherapy. This treatment involves the exposure of the infant's skin to fluorescent light, which facilitates the breakdown of bilirubin. Studies have shown that blue fluorescent light is particularly effective in reducing bilirubin levels. However, due to the alteration of the infant's skin coloration under blue light, fluorescent bulbs emitting light within the 420 to 460-nanometer spectrum are often preferred.

The term phototherapy refers to the use of light, particularly ultraviolet light, to treat medical conditions. The therapeutic benefits of natural sunlight in treating certain skin disorders have been recognized for thousands of years. Historical records from Indian medical literature dating back to 1500 BC describe the combination of herbs with natural sunlight to treat depigmented skin conditions. The use of artificial light sources in phototherapy emerged in the 19th century, with Professor Niels Ryberg Finsen, regarded as the father of phototherapy, pioneering the approach.

Need of the study

In the state of Madhya Pradesh, the prevalence of neonatal jaundice is estimated to be around 50% among hospital-born neonates, with a significant proportion presenting with severe hyperbilirubinemia requiring phototherapy or other interventions. Factors contributing to the high prevalence in Madhya Pradesh include delays in seeking medical care, lack of awareness among parents, and limited access to specialized neonatal care facilities.

The high prevalence of neonatal hyperbilirubinemia in these regions underscores the need for improved neonatal screening, timely intervention, and public health education to prevent complications such as kernicterus, which can result in long-term neurological deficits.

About 60% of all newborns experience physiological jaundice, which occurs during the second and third day of life (newborn babies). Throughout the first week of life, 80% of premature babies are impacted by the condition, which affects more than half of all infants. Jaundice causes more than 100,000 late-preterm and term newborns to pass away worldwide each year.

Despite the widespread use of phototherapy, studies indicate that there are significant gaps in knowledge and practice among nursing staff, which may hinder the optimal management of hyperbilirubinemia. Nursing students, particularly those in their final years of training, are at a critical stage where they transition from theoretical learning to practical application. Therefore, it is essential that they possess comprehensive knowledge regarding the indications, contraindications, administration, and monitoring of phototherapy to ensure safe and effective neonatal care.

Educational interventions, such as informational booklets, have been recognized as effective tools for enhancing knowledge and promoting best practices among healthcare providers. Informational booklets are concise, easily accessible, and can be used for self-learning, making them suitable for nursing students who are often engaged in both academic and clinical responsibilities. A study by Afzal *et al*. (2013) [1] demonstrated that the use of educational booklets significantly improved the knowledge and skills of nursing students in the management of pediatric conditions. Similarly, a structured educational program on neonatal jaundice and phototherapy improved nurses' knowledge and reduced the rate of treatment-related errors.

In summary, the rationale for this study is grounded in the need to improve nursing students' knowledge and practices regarding phototherapy in neonatal hyperbilirubinemia through an accessible and effective educational intervention. The findings are expected to provide valuable insights into the potential benefits of using informational booklets as educational tools, ultimately supporting the goal of optimizing neonatal care in clinical settings.

The investigator during his clinical posting observed that all staff nurses were not having adequate knowledge regarding the care of child under phototherapy. This observation motivated the researcher to conduct a study aimed at assessing the effectiveness of informational booklet on knowledge regarding phototherapy among staff nurses working in selected hospitals of Dewas (M.P.).

Problem Statement

A study to assess the effectiveness of informational booklet on knowledge regarding phototherapy among staff nurses working in selected hospitals of Dewas (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 $p \leq 0.05$.

Assumption

It is assumed that:

1. Staff nurses may have some knowledge regarding phototherapy among nursing students
2. Informational booklet may increase knowledge of staff nurses regarding phototherapy.

Delimitation

1. The study is limited to 4 weeks.
2. The study is limited to 120 staff nurses of selected hospitals of Dewas (M.P.).

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.

Variables
Variable are the conditions or characteristics that the investigator observes manipulates or controls. The types of variables were identified in these studies:

- **Independent variable:** In the present study the independent variable is the informational booklet regarding phototherapy among staff nurses.
- **Dependent variable:** In this present study the dependent variable refers to the knowledge of staff nurses regarding phototherapy.
- **Extraneous Variable:** In the present study it includes as Age, Gender, Professional Qualification, Clinical Experience, Previous Knowledge Sources of Previous Knowledge

The Setting
The present study was conducted in Amaltas Medical College Hospital & Research Centre Dewas (M.P.).

The Population
Target Population: In the present study, the target population consisted of staff nurses.

Accessible Population
In this present study, the accessible population was staff nurses working in selected hospitals of Dewas, (M.P.).

Sample & sample size
In the present study the sample comprised of 120 staff nurses of selected hospitals of Dewas, (M.P.).

Sampling Technique
In the present study non probability purposive sampling technique was used. Samples are selected according to some pre-determined criteria with a purpose. In this technique samples are selected in a process that does not give all the individuals in the population equal chances of being selected in the sample.

Criteria for the selection of the samples
Inclusion criteria
1. Staff nurses who are working in NICU, PICU and pediatric units of selected hospital, Dewas, (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

Data analysis and interpretation

Table 1(a): Frequency and percentage distribution of staff nurses according to demographic variables

No.	Demographic Variable	No.	Percentage (%)
1.	**Age**		
	21-26 years	32	26.7
	27-32 years	54	45.0
	33-38 years	22	18.3
	Above 38 years	12	10.0
2.	**Gender**		
	Male	42	35.0
	Female	78	65.0
3.	**Professional Qualification**		
	GNM	42	35.0
	Post B.Sc.	36	30.0
	B.Sc. Nursing	32	26.7
	M.Sc. Nursing	10	8.3
4.	**Clinical Teaching Experience**		
	1-5 years	40	33.3
	6-10 years	52	43.3
	Above 10 years	28	23.3
5.	**Previous Knowledge**		
	Yes	28	23.3
	No	92	76.7
6.	**Sources of Previous Knowledge**		
	In-service education	6	5.0
	Mass media	4	3.3
	Classroom teaching	18	15.0
	None	92	76.7

Table 2(a): Comparison of the pretest and posttest knowledge grade

S. No.	Knowledge grade		Pre-test		Post-test	
			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

The above table shows the pretest and posttest knowledge Grade.

Thus, the intervention was helpful in improving the posttest knowledge Grade of the staff nurses.

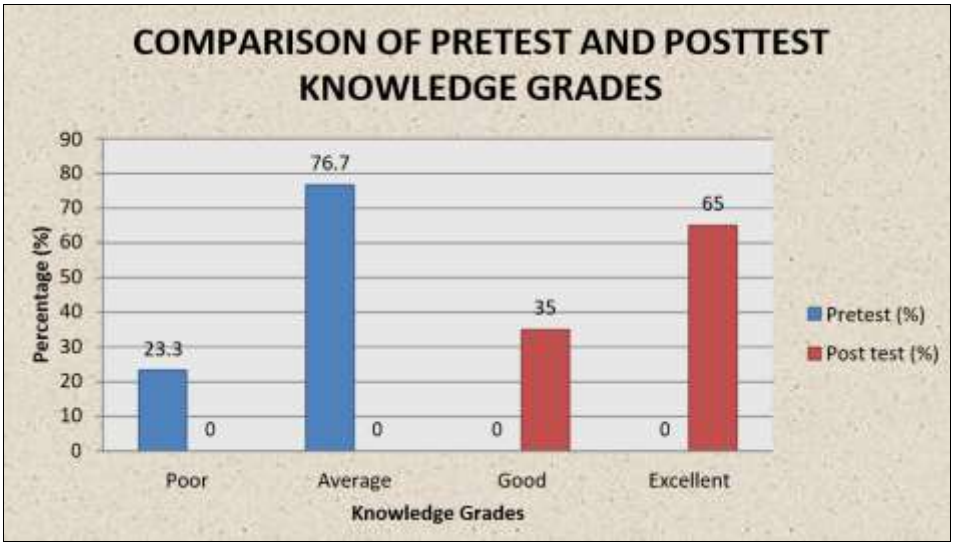

Fig 1: Bar diagram showing comparison of pretest and posttest knowledge grade

Table 2(b): Comparison of the pretest and posttest knowledge score

S. No.	Knowledge Score	Mean±SD	'Z' value	p value
1.	Pre-test	9.05±2.45	24.62, df=119	0.05
2.	Post-test	19.98±2.57		

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

The above table shows the comparison of pretest and posttest knowledge score.

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.

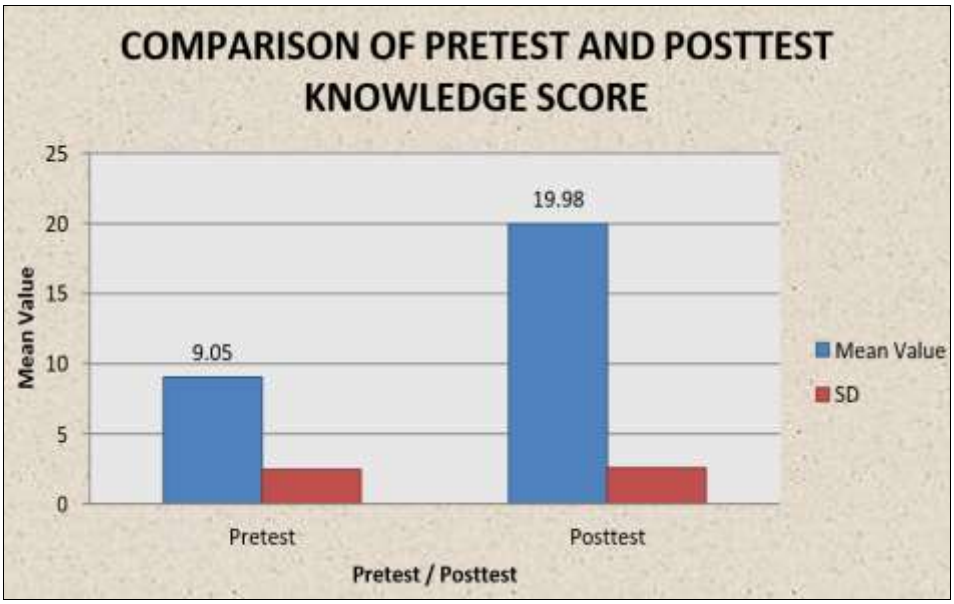

Fig 2: Bar diagram showing comparison of pretest and posttest knowledge score

Association between pre-test knowledge score with selected demographic variables

Table 3: Association of pretest knowledge grade with demographic variable

S. No.	Age	Pretest Knowledge grade				χ2	p value
		Poor (1-6)	Average (7-12)	Good (13-18)	Excellent (19-24)		
1.	**Age**						
	21-26 years	8	24	0	0	0.43, df=3	0.05, NS
	27-32 years	14	40	0	0		
	33-38 years	4	18	0	0		
	Above 38 years	2	10	0	0		
	Total	28	92	0	0		
2.	**Gender**						
	Male	10	32	0	0	0.04, df=1	0.05, NS
	Female	18	60	0	0		
	Total	28	92	0	0		
3.	**Professional qualification**						
	GNM	6	36	0	0	6.22, df=3	0.05, NS
	Post B.Sc. [N]	8	28	0	0		
	B.Sc. Nursing	14	18	0	0		
	M.Sc. Nursing	0	10	0	0		
	Total	28	92	0	0		
4.	**Clinical experience**						
	1-5 years	10	30	0	0		
	6-10 years	12	40	0	0	10, df=2	0.05, S
	Above 10 years	6	22	0	0		
	Total	28	92	0	0		
5.	**Previous knowledge**						
	Yes	4	24	0	0		
	No	24	68	0	0	0.83, df=1	0.05, NS
	Total	28	92	0	0		
6.	**Sources of previous knowledge**						
	In service education	0	6	0	0	2.65, df=3	0.05, NS
	Mass media	2	2	0	0		
	Classroom teaching	2	16	0	0		
	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 ($\chi2$= 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 ($\chi2$=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 ($\chi2$=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 ($\chi2$=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 ($\chi2$=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 ($\chi2$=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 ($\chi2$), 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 "RH1: There will be significant difference between pre-test knowledge and post-test knowledge score regarding phototherapy among staff nursesat the level of $p \leq 0.05$.is accepted.

It is evident from the results that RH2: 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.

Conflict of Interest
Not available

Financial Support
Not available

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