



Effectiveness of Video-assisted Teaching Program on Knowledge of Post-basic B.Sc. Nursing 1st Year Students Regarding Management of Neonate Receiving Phototherapy at Selected Nursing College Anantnag, Kashmir

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Abstract

Neonatal jaundice, primarily caused by elevated levels of unconjugated bilirubin, is a common condition affecting a significant number of newborns worldwide. Phototherapy has emerged as the standard and most effective treatment to prevent complications such as kernicterus and neurodevelopmental delays. However, the effectiveness of phototherapy relies greatly on the knowledge and skills of healthcare providers, particularly nurses, who are the primary caregivers in neonatal care.

Title of study: "Effectiveness of video-assisted teaching program on knowledge of post- basic B.Sc. Nursing 1st year students regarding management of neonate receiving phototherapy at selected Nursing college Anantnag, Kashmir."

Objectives of the study: To assess the pre-test knowledge scores of post basic BSc Nursing 1st year students regarding the management of neonate receiving phototherapy. To assess the post-test knowledge scores of posts basic BSc Nursing 1st year students regarding the management of neonate receiving phototherapy. To evaluate the effectiveness of video assisted teaching program on knowledge of post basic B. Sc. Nursing 1st year students regarding the management of neonate receiving phototherapy by comparing pre-test and post- test knowledge scores. To determine the association of the pre-test knowledge scores of post basic B. Sc. Nursing 1st year students regarding the management of neonate receiving phototherapy with their selected demographic variables i.e. age, gender, professional qualification, residence, previous knowledge regarding phototherapy and clinical experience.

Materials and methods: A pre-experimental one group pre-test post-test research design was used. The study was conducted at Florence Paramedical and Nursing College Anantnag, Kashmir. 40 samples were selected by using simple random sampling technique. The data collection tool used was a "Self-structured questionnaire" before and after the administration.



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Introduction

"A neonate is a blank canvas, waiting for life's colors to paint their story." which means that a new-born has limitless potential, with their experiences and environment shaping who they will become. Neonatal period encompasses the first 28 days of life, and it is the very crucial period for newborn as during this period there is not only rapid the growth and development of the child but the child is also thriving adjust in the extra uterine Life. During this period the immunity of the neonate is still developing and his organs are still not well functional he may encounter various conditions or diseases and one of the significant conditions that a child face is neonatal hyperbilirubinemia also known as neonatal jaundice [12].

Jaundice is a condition in which excess levels of unconjugated bilirubin (>5 mg/dl) accumulate inside the body leading to yellowish discoloration of skin and mucus membrane. Jaundice found in neonates can be of various types including pathological and physiological [4].

In early days neonates with jaundice were exposed to direct sunlight all naked but it was later on contraindicated due to various reasons like sunlight contains various spectrum of light including UV rays which can be harmful for infants and also, we cannot control the sunlight intensity so it can lead to overheating and dehydration of neonate [5].

So, nowadays the primary and most effective treatment for the jaundice is proven to be the phototherapy. The concept of phototherapy evolved back in early 1950s when an intelligent nurse at a hospital in England observed that the neonates placed near the window faced less incidence of neonatal jaundice as compared to other neonates. Later on, in late 1950s Dr. Cremer, a British paediatrician, along with Dr. Perryman and Dr. Richard, found out that light has the ability to break the unconjugated bilirubin into a soluble form which can be excreted from the body by bypassing the liver [6].

Phototherapy is a procedure in which fluorescent lights, usually white light, green light and blue light in combination, are used in a range of 400-520 nm (450-480 nm is best wavelength preferred) to convert unconjugated bilirubin into conjugated bilirubin or any soluble form of bilirubin like lumirubin in order to excrete it from the body because unconjugated bilirubin absorbs light in this spectrum in order to get broken down into its soluble form. Phototherapy works on three principles that is geometric photo isomerization, structural isomerization and oxidation [9].

Now in the field of nursing, the knowledge regarding neonatal jaundice and phototherapy is a vital aspect, as nurses are the primary caregivers and are responsible for taking care of the patient, so having knowledge regarding these aspects can be really helpful in yielding positive results. And the use of video-assisted teaching instead of traditional teaching methods in expanding and providing this knowledge can be really helpful by keeping in view the complexity of clinical procedure, especially in the field of nursing, as nurses are primary care providers and spend maximum time among all health-care team with the patient [11]. So, using video assisted teaching will not only help to expand the knowledge of future nursing department, but will also save time and increase efficacy and competency in them.

Need of the study

The incorporation of technology into the field of medicine,

especially in the nursing field, has proven to be a great success. And one of the components of technology that has helped in providing a quality care to the population is phototherapy. Phototherapy has been used for treating various disease conditions and one of them is neonatal jaundice. Although, the use of phototherapy helps in reversing the conditions like neonatal hyperbilirubinemia, but the effective use of phototherapy is necessary to avoid its associated complications like dehydration etc [12].

Neonatal jaundice is a significant health concern in India, with an estimated 14.1 million newborns (10.5% of live births) requiring phototherapy for jaundice annually. However, approximately 6 million of these infants lack access to necessary treatment, and 2.4 million without access are in Central and South Asia [13]. In India, the incidence of referral for neonatal jaundice is 29.3 per 1,000 live births [14].

Despite the high demand for neonatal care, India faces a shortage of healthcare professionals. The World Health Organization recommends 44.5 doctors, nurses, and midwives per 10,000 inhabitants, but India's national density is only 20.6 per 10,000 [15]. Additionally, the country needs an additional 4.3 million nurses by 2024 to meet WHO norms [16]. These statistics underscore the critical need for effective training programs for healthcare providers, such as video-assisted teaching, to enhance the management of neonates receiving phototherapy.

India has shown different pattern of incidence of neonatal jaundice across its various regions. One of the studies, which was conducted in the India's Northeast region, reported that out of 710 newborns, 439(61.8%) developed clinical jaundice, and among those, 290(66%) had physiological jaundice, while 149(34%) had pathological jaundice [17].

Similarly, another study was conducted in India's south region on 560 newborns and it was found that 273(48.8%) developed clinical jaundice and out of those, 166(61%) had physiological jaundice and 107(39%) had non-physiological or pathological jaundice [18].

Bura 'a and Younis in 2023 conducted a descriptive study at Mosul, Iraq to assess the knowledge of nursing students regarding phototherapy. The results came out to be 47% had acceptable knowledge, 27% had good knowledge, while 19% had poor knowledge [19].

So, in our study we have tried to incorporate video-assisted teaching as it not only saves time but also has been proven to increase understanding and helps retain knowledge easily for a longer duration of time. Though the use of phototherapy for treating neonatal jaundice has been used since decades, and nurses are the primary caregivers, but there still exists a gap between the actual knowledge and the practice. So, through our research, we want to assess the effectiveness of video-assisted teaching so that we can identify the gaps and try to fulfil them onwards.

Materials and methods

A quantitative research approach was used for the present study with a pre- experimental one group pre-test post-test research design. Permission was obtained from concerned authorities to conduct the final study. Ethical clearance was obtained from Institutional Ethical Committee (IEC) to conduct the study using simple random sampling technique to select 40 Post Basic B.Sc. Nursing 1st year students at FPNC (Florence

Paramedical and Nursing College), Anantnag, Kashmir. Data was collected by the researchers themselves using self-structured questionnaire from 3 April 2025 to 10 April 2025.

The reliability of 'self-structured questionnaire' regarding phototherapy was determined by using "test- retest method" i.e., by administering the self-structured questionnaire to 5% of the sample size. The reliability coefficient was calculated by using Karl Pearson's correlation reliability coefficient where "r" came out to be 0.5.

A "Self-structured questionnaire" was administered before and after the administration of video-assisted teaching program to assess the knowledge of post- basic B. Sc. Nursing 1st year students regarding management of neonate receiving phototherapy.

Analysis and interpretation were done in accordance with the objectives laid down for the study. The data collected was fed to an IBM computer and analyzed using the Statistical Package for Social Sciences (SPSS) and Microsoft excel. Significance of the obtained results were judged at the 5% level (p value of <0.05). The findings were organized and presented in tables and figures.

Descriptive statistics (frequency, percentage, mean and standard deviation) were used to describe demographic variables and knowledge scores (pre-test and post-test). In Inferential statistics Paired 't' test was used to compare pre-test and post-test knowledge scores and Chi-Square test was used to determine the association of pre-test knowledge scores with their demographic variables.

Results and discussion

Findings related to Socio-demographic variables:

The findings of the study showed that out of 40 study subjects, about half (55%) of participants are aged 20-23 years, while one-half (45%) are aged 24-26 years. Females constitute majority (75%) of the sample, indicating a predominantly female participant. Majority participants (95%) are pursuing a Diploma in GNM, with only 5% in GNM Lateral Entry. A vast majority (95%) of participants reside in rural areas, with only 5% from urban areas. Majority of participants (70%) had no prior knowledge of phototherapy, while one-third (30%) had some prior knowledge. The majority (87.5%) have less than one year of clinical experience, indicating a relatively inexperienced group.

The findings of the present study were supported by the study conducted by Pandya and Ravindra (2015) ($n=60$) who evaluated the effectiveness of planned teaching program on knowledge of diploma nursing students regarding care of the neonate under phototherapy at selected nursing school Gujarat. Almost two third of the study subjects that is 68% were in the age group of 20 - 25 years. And 16% were in the age group between 22-25. And majority of the study subjects were female (90%) and only 10% were male [20].

The findings of the study were also endorsed by the study conducted by the study conducted by Rehman and Ahmed (2017) ($n=30$), who assessed the effectiveness of self-instructional module among 4th year nursing students on phototherapy at selected hospital Kolkata, West Bengal. Almost all the study subjects, 99% had GNM as their professional qualification [21].

The findings of the study were also enlightened by the study conducted by the study conducted by Singh and Choudhury

(2019) ($n=30$), who assessed effectiveness of video-assisted teaching program among UG 4th year nursing students on phototherapy at Selected College, Lucknow. Majority (93.3%) of study subjects were from rural area, while minimum (6.66%) was from the urban area [22].

These findings of the present study were also endorsed by the study conducted by Sharma (2024) ($n=120$), who assessed effectiveness of booklet on knowledge of 4th year nursing students regarding phototherapy at Dewas, MP. Majority (76.7%) had no previous knowledge regarding phototherapy, and 23.3% had some prior knowledge [23].

Findings related to knowledge scores

In pretest knowledge score maximum of the study subjects (75%) had moderate knowledge, whereas 25% had inadequate knowledge and none of the study subjects had adequate knowledge with mean \pm SD = 16.83 ± 3.381 . The findings of the present study were supported by the study conducted by Baruah, Das, Kalita, (2023) among 60 3rd year BSc Nursing students to evaluate impact of structured teaching program on knowledge regarding phototherapy at Gawahati, Assam. The pre- test knowledge score revealed 26.7% had inadequate knowledge, 66.6% had moderate knowledge, and 6.7% had adequate knowledge [24].

In post-test knowledge score, maximum of the study subjects (95%) had adequate knowledge, whereas 5% had moderate knowledge and none of the study subjects had inadequate knowledge with mean \pm SD = 28.05 ± 1.739 . The findings of the present study were supported by the study conducted by Gani and Ahmed (2021) among 60 4th year nursing students to assess the effectiveness of self-instructional module on knowledge regarding phototherapy, Kashmir. The post-test knowledge score revealed 5% had good knowledge and 95% had adequate knowledge [25].

Findings related to comparison of pre- test and post-test knowledge scores

The findings of the present study revealed the mean post-test knowledge score is significantly higher than the mean pre-test knowledge score at $P \geq 0.05$ level of significance with $t=18.752$. This finding was supported by the study conducted by Tajne (2021) among 30 3rd year GNM students to assess the effectiveness of video assisted teaching on knowledge about neonate undergoing phototherapy Surat, Gujarat. The comparison of pre-test and post-test knowledge score showed that there was significant gain in the knowledge scores of students after VAT at $P \geq 0.05$ level of significance with $t=22.6.26$

Findings related to association between pretest knowledge score of study subjects with their demographic variables The chi-square value of the present study revealed that there is a significant association between the pre-test knowledge score and demographic variables like gender ($p=0.035$) and previous knowledge regarding phototherapy ($p=0.017$). While there is no significant association between the pre-test knowledge scores and demographic variables like age, professional qualification, residence, and clinical experience at 0.05 level of significance.

These findings of the present study were supported by the study conducted by Pandya and Ravindra (2015) among 60 Diploma Internship Nursing Students to evaluate effectiveness of planned teaching program on knowledge regarding care of newborn under phototherapy at selected nursing school Gujarat. The results show that there is a significant association

between the knowledge of diploma internship nursing students with their demographic variable like gender ($p=0.011$) and there is no significant association between knowledge of diploma internship nursing students with other demographic variables such as age, previous knowledge, religion, marital status at $P \geq 0.05$ level of significance [20].

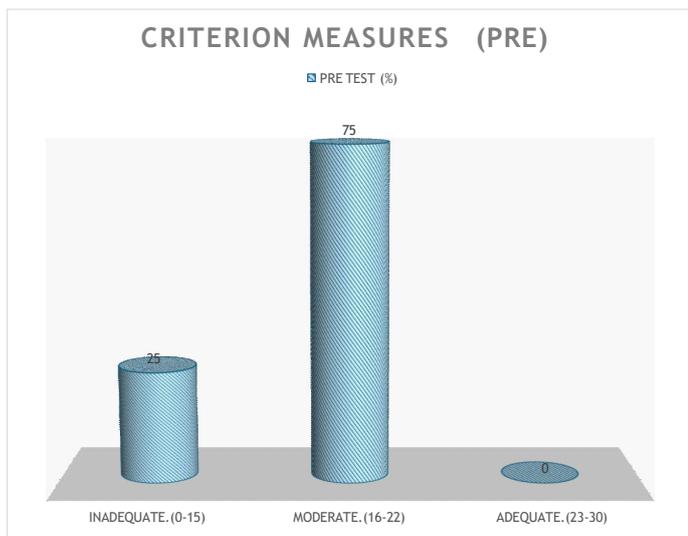


Figure 1: Diagram showing the percentage distribution of pre-test knowledge.

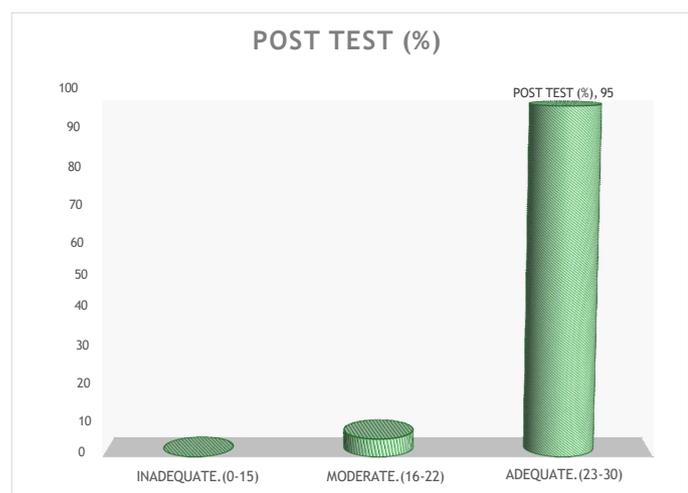


Figure 2: Diagram representing percentage distribution of post-test level of knowledge.

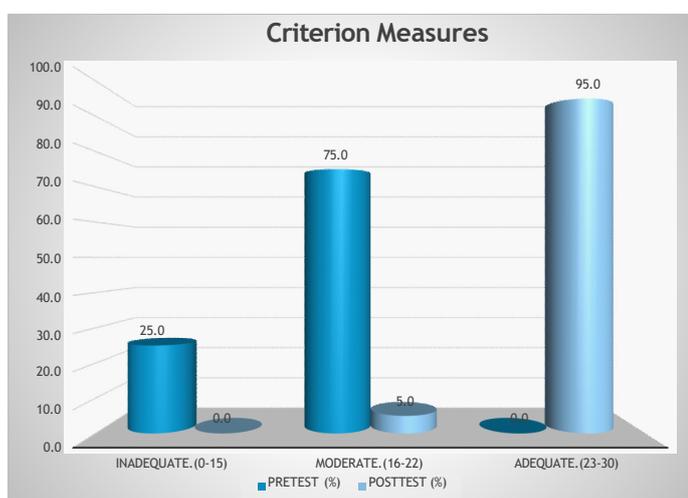


Figure 3: Diagram representing comparison of percentage distribution of pre-test and post- test level of knowledge.

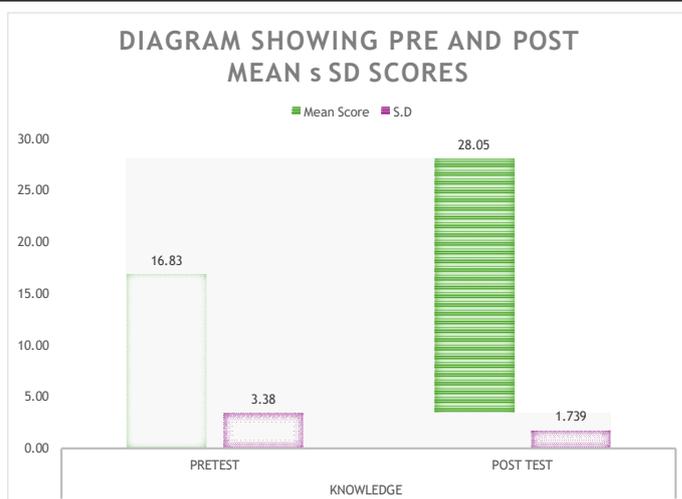


Figure 4: Bar diagram representing Mean & SD of pre-test and post-test knowledge scores

Table 1: Frequency and percentage distribution of subjects according to demographic variables n=40.

Variables	Categories	Frequency (f)	Percentage (%)
Age in years	20-23	22	55.00%
	24-26	18	45.00%
	>26	0	0.00%
Gender	Male	10	25.00%
	Female	30	75.00%
	Others	0	0.00%
Professional qualification	Diploma (GNM)	38	95.00%
	GNM Lateral entry (LE)	2	5.00%
	In-service GNM Staff nurses	0	0.00%
Residence	Rural	38	95.00%
	Urban	2	5.00%
Previous knowledge regarding phototherapy	Yes	12	30.00%
	No	28	70.00%
Clinical experience	<1 year	35	87.50%
	1 year	3	7.50%
	>1 year	2	5.00%

Table 2: Frequency & Percentage distribution of pre-test knowledge scores n=40.

Level of knowledge	Knowledge score of study subjects	PRE-TEST	
		Frequency (f)	Percentage (%)
Inadequate	0-15	10	25%
Moderate	16-22	30	75%
Adequate	23-30	0	0%

Maximum score = 30; Minimum score = 0

Table 3: Frequency & Percentage distribution of post-test level of knowledge n=40.

Leve of knowledge score	Knowledge score of study subjects	Post-Test	
		Frequency (f)	Percentage (%)
Inadequate	0-15	0	0%
Moderate	16-22	2	5%
Adequate	23-30	38	95%

Maximum score = 30; Minimum score = 0

Table 4: Comparison of frequency & percentage distribution of pre-test and post-test level of knowledge n=40.

Criteria measure of knowledge		
Score level (N=40)	Pre-test f (%)	Post-test f (%)
Inadequate. (0-15)	10(25%)	0(0%)
Moderate. (16-22)	30(75%)	2(5%)
Adequate. (23-30)	0(0%)	38(95%)

Table 5: Comparison of descriptive statistics of pre-test and post-test Scores of knowledge n=40.

Knowledge score	Mean + SD	Mean %	Mean Difference	p-value
Pre-test	16.83+3.381	56.1	11.22	<0.001*
Post-test	28.05+1.739	93.5		

*= Significant at 0.05 level.

Table 6: Table showing association of scores and demographic variables n=40.

Variables	Categories	Adequate	Moderate	Inadequate	Chi Test	P Value	df	Result
		(f)	(f)	(f)				
Age in years	20-23	0	18	4	1.212	0.271	1	Not Significant
	24-26	0	12	6				
	>26	0	0	0				
Gender	Male	0	5	5	4.444	0.035**	1	Significant
	Female	0	25	5				
	Others	0	0	0				
Professional qualification	Diploma (GNM)	0	28	10	0.702	0.402	1	Not Significant
	GNM Lateral entry (LE)	0	2	0				
	In-service GNM	0	0	0				
	Staff nurses							
Residence	Rural	0	28	10	0.702	0.402	1	Not Significant
	Urban	0	2	0				
Previous knowledge regarding phototherapy	Yes	0	12	0	5.714	0.017**	1	Significant
	No	0	18	10				
Clinical experience	<1 year	0	26	9	1.676	0.433	2	Not Significant
	1 year	0	3	0				
	>1 year	0	1	1				

Limitations

The following points were beyond the control of the investigators:

- The sample size was small and drawn from a single college, which may affect how well these results apply to broader student populations.
- The study focused only on short- term knowledge gains and didn't assess how well the students retained the information over time.
- Other teaching methods were not compared alongside video-assisted learning.

Conclusion

Based on the findings of the study, following conclusions were drawn:

- The findings of the study clearly demonstrate that the video-assisted teaching program was significantly effective in enhancing the knowledge of the study subjects. Before the intervention, a majority of the students (75%) had moderate knowledge and (25%) had inadequate knowledge. However, after the Video Assisted Teaching (VAT), 95% of students achieved an adequate level of knowledge.

- The mean post-test knowledge score was significantly higher than the mean pre-test knowledge score at 0.05 level of significance, with t=18.752. Despite the fact that majority of the study subjects had moderate level of knowledge about the aspects of phototherapy, they still faced mild to moderate or moderate to severe challenges in the management of neonate under phototherapy.
- Hence, it can be inferred that the administration of VAT had a significant impact on improving the knowledge of the study subjects regarding management of neonate under phototherapy. Therefore, the study reinforced the need of incorporation of video teaching programs to incredibly enhance the knowledge of the nursing students regarding management of neonate under phototherapy.

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