Effectiveness of Structured Teaching Programme Regarding Prevention of Infection in Hospitalized Neonates Among Nursing Students

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BSTRACT

Introduction: Neonatal infection presents with systemic signs of infection and the detection of bacteria or other pathogens in the bloodstream. Infants are particularly vulnerable to bacterial sepsis, and the incidence of sepsis in the neonatal intensive care unit surpasses that of any other hospital department. Educating caregivers through instructional programs can prove beneficial in preventing these infections.

Objective: The aim of the study was to assess the effectiveness of a structured teaching program in preventing infection in hospitalized neonates.

Methods: A study was conducted among 96 nursing students enrolled in a bachelor-level nursing program at a selected nursing college in Pokhara. The students were chosen using a complete enumerative sampling technique to ensure a diverse group. Data was collected from the nursing students using a self-administered semi-structured knowledge questionnaire. The collected data was analyzed using descriptive and inferential statistics.

Results: The findings indicate that 56.25% of the participants possess a moderately adequate level of knowledge, while 31.25% have an inadequate knowledge level in the pre-test. However, after the post-test, there was a significant increase in the knowledge score, with 75% of the respondents demonstrating an adequate level of knowledge. The structured teaching program proved to be effective in enhancing the knowledge level among nursing students, as evidenced by a t-test value of 16.89 (p<0.05).

Conclusions: A study found that implementing a structured teaching program effectively improves nursing students' knowledge level. This equips them with the necessary knowledge to prevent neonatal infections, reducing morbidity and mortality rates among new-borns.

Keywords: Hospitalized; neonatal infection; neonates; structured teaching program.

INTRODUCTION

Neonatal infection is manifested by systemic signs of infection and isolation of bacteria or other pathogens from the blood.[1]

Infection in the new born increases the risk of developing neurodevelopmental impairments along with impaired language and cognitive skills later in preschool life.[2] Every year, neonatal infections account for approximately 750,000 neonatal deaths globally. It is the third major cause of neonatal death, globally and in Nepal.[3] Neonates are at the highest risk for

bacterial infection , with the prevalence at 1 to 10 per 1000 live births worldwide.[4] The prevalence of neonatal infections ranges between 2 and 4% in Nepal with 37.1% of infections occurring in neonatal intensive care units of tertiary referral Hospital[5] with approximately 40 times higher incidence rates of neonatal infection and double the mortality rates in low and middle income countries.[6]

Neonatal infections occur as early or late infections[7] which accord substantially to neonatal morbidity and mortality and is an ongoing major global public health challenge. According to the World Health Organization (WHO), four million new born children die each year during the first four weeks of their lives. About 30-50% of global death recorded were due to infections.[8] About 20% of very low birth weight, preterm infants suffer serious systemic infections during their hospital stay.[7]

A study was conducted on the clinical and bacteriological profile of neonates admitted in the Neonatal Care Unit of a western regional hospital, Nepal. The study finding shows that neonatal infection accounted for 38% of the total admission.[9] Infection rate in NICU is among the highest anywhere in the hospital. So, to reduce the infant mortality rate, the Nursing personnel working in the neonatal unit should be knowledgeable and skilful in the prevention of neonatal infections. In case of failure to adopt the

infection control techniques, it will lead to septicaemia and neonatal death eventually.[10]

METHODS

A pre-experimental pre-test post-test research design was adopted. The study was conducted in Gandaki Medical College, College of Nursing Sciences (GMC, CONS) at Pokhara. GMC, Pokhara was established in 2007 A.D and situated in Lekhnath-2 Rithepani. Total 131 nursing students were studying in BNS and BSc Nursing. Among them students who were studying B.SC nursing 3rd year and 4th year, as well as BNS 1st, 2nd, and 3rd year were selected for the study because those students have already studied this topic in their course and have exposure to neonatal ward and NICU at hospital. There are altogether 96 students studying from both BNS and B.SC nursing program. Study was conducted online [pre-test, post-test, and Structured Teaching Program (STP)] for that online learning facility was available at GMC.

The knowledge scores of the studied nursing student were evaluated by comparing the 33 questions they answered with the model key answer. The correct answer was given 1 score and the incomplete or incorrect answer was given 0. The total knowledge score was 33 which is converted as 100%. Knowledge was considered as adequate if score of knowledge percentage was > 75%, moderately adequate if score of

knowledge percent was 50-75%, or Inadequate if score of knowledge percent was < 50%.

Reliability analysis was done by Cronbach's Alpha test which was obtained 0.836 and found tool was reliable. Pre-testing of tool was done among 10% (9) nursing students from different college to evaluate tools for its applicability clarity for filling study tools. After obtaining the results 2 items were found ambiguous and were omitted and one item was modified and finalized the study tools. The participant included in pretesting were excluded in final study.

Ethical Approval was taken from Gandaki Medical College Teaching Hospital and Research Center, Institutional Review Committee (GMC-IRC). Ref No:91/2077/2078. Permission was taken from college authority to conduct study and verbal as well as written permission was obtained from study participants. Confidentiality and anonymity was maintained.

RESULTS

Part I Demographic Variable

As illustrated in Table 1, the largest proportion (59.38%) of students belonged to the age group of 20-25 years. It is noteworthy that all the students in the study were female. Furthermore, a significant number of students (47.9%) identified themselves as followers of the Buddhist religion. In terms of academic year, the highest percentage (23.96%) of students were enrolled in the BSc 4th

year. Lastly, the majority of students (96.87%) had not participated in any seminars pertaining to neonatal infection.

Table 1: Distribution of respondents according demographic variables (N=96)

S. N	Demographic variables	Frequency	Percentage
1	**Age in years**		
A	20-25	57	59.38%
B	26-30	39	40.62%
2	**Religion**		
A	Hindu	39	40.6%
B	Buddhist	46	47.9%
C	Christian	10	10.4%
D	Muslim	1	1.04%
3	**Education status**		
A	BSc 3rd year	22	22.91%
B	BSc 4th year	23	23.96%
C	BNS 1st year	8	8.34%
D	BNS 2nd year	21	21.88%
E	BNS 3rd year	22	22.91%
4	**Any Seminar attended**		
A	Yes	3	3.13%
B	No	93	96.87%

Part II Effectiveness of Structured Teaching Program

During the pre-test, the majority of students possessed a moderately adequate level of knowledge. However, in the post-test, 75% of the students demonstrated an adequate level of knowledge (Figure 1).
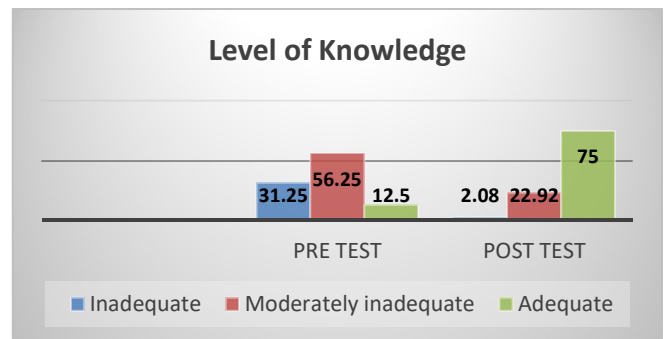

Figure 1: Bar diagramming showing Comparison of level of knowledge in pre-test with post-test.

The results in Table 2 show that the average knowledge score in the post-test (16.12) surpasses the average pre-test knowledge score (9.68). The t-test value of 16.89 indicates statistical significance, thereby confirming the effectiveness of the structured teaching program in enhancing the students' knowledge level.

Table 2: Comparison of level of knowledge in pre-test with post- test and effectiveness of the study. N=96

Level of knowledge	Pre-test			Post test			Mean difference	t-test
	Frequency	Percentage	Mean	Frequency	Percentage	Mean		
Inadequate	30	31.25	9.68	2	2.08	16.12	6.44	16.89*
Moderately adequate	54	56.25		22	22.92			
Adequate	12	12.5		72	75			
p<0.05				* = Significant				

Part III Association between pretest knowledge scores and selected demographic variable
It reveals that there is no significant association between pre-test knowledge score and demographic variable.

Table 3: Association between pre-test knowledge scores and selected demographic variable. (N=96)

Baseline variables	⋋2	Knowledge Df	Inference	Table value
Age in years	1.687	1	NS	7.82
Religion	2.752	1	NS	3.84
Education	3.33	2	NS	5.99
Seminar attended	3.57	2	NS	5.99

DISCUSSION

The recent study has uncovered that a significant majority of 57% of nursing students are young females aged between 20 and 25 years. This finding aligns with a previous study conducted by Mohamed DA. Alatroshi AM., where all nurses were also young females.[11] Furthermore, Hevamalage P., et.al found that younger nurses displayed higher motivation to acquire knowledge and had a greater capacity to accept new information.[12] It is crucial to educate nurses about neonatal infection as those directly involved in providing care have the power to influence the outcomes of neonatal care. By enhancing their knowledge in this area, we can improve the safety and overall results of neonatal care.[13]

The current study revealed that a significant proportion of participants, specifically 56.25%, possessed a moderate level of knowledge, while 31.25% had insufficient knowledge prior to the

implementation of the structured teaching program. A study conducted in Baghdad also demonstrated comparable results, indicating that 62.7% of nurses lacked adequate knowledge regarding sepsis and its prevention. Furthermore, a separate study conducted in Sri Lanka found that 72.8% of participants exhibited a commendable understanding of neonatal sepsis, whereas the remaining 27.2% possessed a satisfactory level of knowledge.[13]

In the current study, it was observed that one-third of the respondents experienced an increase in their knowledge level after participating in a structured teaching program. Additionally, it was found that 75% of nursing students possessed sufficient knowledge regarding neonatal infection. Similarly, a study conducted in India revealed that initially, 43.3% of participants had average knowledge, which improved in the post-test, resulting in 63.3% having good knowledge.

Another study conducted in Tumkur also yielded similar findings. In the pre-test, 78.33% had inadequate knowledge, 21.67% had moderately adequate knowledge, but in contrast, the post-test showed an increase in knowledge scores, with 85% having adequate knowledge regarding infection control measures in the NICU.[10] The participating nursing students demonstrated a significant improvement in their scores between the pre-test and post-test, indicating the effectiveness of the structured teaching program.

This further suggests that the nursing students were dedicated and interested in the educational program, as they actively sought to enhance their knowledge in this area.[11]

The results of the present study indicate that the structured teaching program has proven to be highly effective in enhancing the knowledge level of nursing students regarding neonatal infection. This is supported by a t-value of 16.89 at a significance level of $p<0.05$. These findings are consistent with a study conducted by Nizzi V. et al., where respondents also demonstrated an increased level of knowledge in the posttest, with a t-value of 16.266 at a significance level of $p<0.001$. It is evident that nursing students have a strong desire to acquire knowledge about neonatal care in order to prevent neonatal infection. By recognizing the early signs and symptoms and initiating prompt care, they can significantly improve neonatal outcomes and contribute to the reduction of global burden associated with neonatal morbidity and mortality.

CONCLUSION

The study concluded that structured teaching program was found to be effective and applicable in providing knowledge to nursing students regarding neonatal infection. As nurses provide direct care and have the ability to influence neonatal outcomes, it is essential to provide

education to enhance knowledge thus they can provide effective care.

Conflict of interest: None

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