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A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING VAP BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA AMONG STUDENTS IN SELECTED NURSING COLLEGE AT MORADABAD, U.P

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ABSTRACT: Ventilator-associated pneumonia (VAP) is defined as pneumonia that occurs 48–72 hours or thereafter following endotracheal intubation, characterized by the presence of a new or progressive infiltrate, signs of systemic infection (fever, altered white blood cell count), changes in sputum characteristics, and detection of a causative agent. Ventilator associated pneumonia is one of the leading cause of death in worldwide the Global crude mortality rate of VAP ranges from 24% to 50%. And in India 37.5% of infections of ICU patient are of VAP due to lack of preventive measures followed and lack of knowledge regarding VAP bundle in nursing staff. Lack of knowledge of infection prevention and proper nursing care among nurses may become a barrier in adhering to evidence-based guidelines for preventing ventilator-associated pneumonia. Therefore, the present study aimed to assess the effectiveness of a structured teaching programme on knowledge regarding VAP bundle in prevention of ventilator associated pneumonia among nursing students.

Keywords: Effectiveness, Structured Teaching Program, Knowledge, Ventilator Associated Pneumonia (VAP), VAP Bundle, Nursing Students.

INTRODUCTION

Our body cells require energy for their chemical action that maintains homeostasis. Chemical processes that can only occur in the presence of oxygen provide the majority of this energy. Co₂ is typically produced as a byproduct of these processes. The pulmonary system allows O₂ from the environment to enter the human system and releases Co₂ gas into the atmosphere.¹

Respiratory diseases are causing very higher deaths globally. Among respiratory diseases pneumonia, tuberculosis, chronic obstructive pulmonary disease and lung cancer are collectively responsible for 9.5 million peoples death globally during 2008 that is one sixth of the worldwide total.²

Pneumonia is the leading reason of the deaths among communicable disease in United States. Pneumonia is the seventh foremost reason for mortality among all the age and sex groups causing 7000 deaths every year. Among the peoples of age above 65 years it is leading cause of mortality. Pneumonia can be managed on the in the inpatient and outpatient basis.³

In all the hospital borne infections VAP is most frequent occurring infection in ICU. It depends on longer critical care unit stay and prolonged ventilator days of patient.⁴

Mechanical ventilator was first used by a Roman physician Galen he used bellows to pump up lungs of an dead animal. Mechanical ventilator was not used widely in that era. But when polio epidemic arrived in the year 1950s it is used very commonly for treating patients. The main purpose of mechanical ventilator is to help patient in breathing when unable to breath properly by himself and saves patient from life threatening conditions like hypoxemia and hypercarbia.⁵

A mechanical ventilator is a device that used to helps a person breathe (ventilate) when the patient has undergone surgery or unable to breathe on their own due to a serious illness. A hollow tube (artificial airway) is passed into the patient mouth down till trachea which is connected to ventilator. Patients remain on the ventilator until their condition is improved and they are able to breathe on their own.⁶ VAP is a kind of pneumonia which develops later the patient is on mechanical ventilator for 48-72 hours. And is characterized by fever, increased white blood cell count, infectious sputum and progressive infiltrate in lungs.⁷

The nurses' lack of awareness of the VAP bundle and their failure to follow the necessary evidence-based standards of it would result in an increase in the prevalence of development of pneumonia by mechanical ventilator. So the nurses should have adequate knowledge of ventilator associated pneumonia for preventing it.⁸



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Ventilator bundle prevents the development of VAP by implementing easy and cost effective precautionary measures. The VAP bundle is an important part of care for a critical patient who is on a mechanical ventilator. The ventilator bundle includes a 30-45 degree inclination of the head-end side of bed, everyday sedation break and routine monitoring of patient for extubation, PUD and DVT prevention, and oral hygiene with 0.12 % chlorhexidine. These measures to prevent VAP should be followed till the patient is extubated.

As a result, the purpose of this study was to determine the efficiency of a structured teaching programme on student nurses' knowledge of the VAP bundle for preventing ventilator-associated pneumonia.

OBJECTIVES

1. To assess the level of knowledge regarding VAP bundle in prevention of ventilator associated pneumonia among nursing students in experimental and control group.
2. To evaluate the effectiveness of structured teaching programme on knowledge regarding VAP bundle in prevention of ventilator associated pneumonia among nursing students in experimental group.
3. To find out the association between the level of knowledge regarding VAP bundle in prevention of ventilator associated pneumonia among nursing students with their selected sociodemographic variables in experimental and control group.

RESEARCH METHODOLOGY

Research Design

In this current study “quasi experimental design” was selected. Which was a Non randomized control group design.

RESEACH SETTING

The research was performed at Teerthanker Mahaveer College of Nursing in Moradabad (UP), and Vivekanand College of Nursing in Moradabad, (U.P)

POPULATION

Students from selected nursing in colleges in Moradabad, U.P, were selected as the study population.

Sample size

Sample size for the current investigation was determined, using cochrane's formula and was found 80 nursing students in selected nursing college of Moradabad (U.P).

Inclusion criteria

B.Sc. nursing 3rd year students:

- Who agreed to take part in the research.
- Accessible during the time of intervention and at the period of collection of data period.

Exclusion criteria

- Students that refuse to participate in the research.
- Students studying other courses than B.sc nursing 3rd year.
- Students those have some medical issue and are absent at the time of the intervention and data gathering.
- Students that does not provide their consent for the study.

Sampling technique

A non-probability purposive sampling strategy was used in this investigation.

Development and description of tool

The tool used for the study consist two parts

Section:1 Demographic Performa

Section:2 Self-Structured Knowledge Questionnaire



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ANALYSIS AND INTERPRATATION

Table 2.2: Assessment of knowledge among experimental group.

N=80

S.No.	CRITERION	RANGE OF SCORE	PRE-TEST KNOWLEDGE n= 40		POST-TEST KNOWLEDGE n= 40	
			f	%	f	%
1	Inadequate knowledge	0 – 10	11	27.5%	0	0%
2	Moderately adequate knowledge	11 – 20	29	72.5%	6	15%
3	Adequate knowledge	21 - 30	0	0%	34	85%

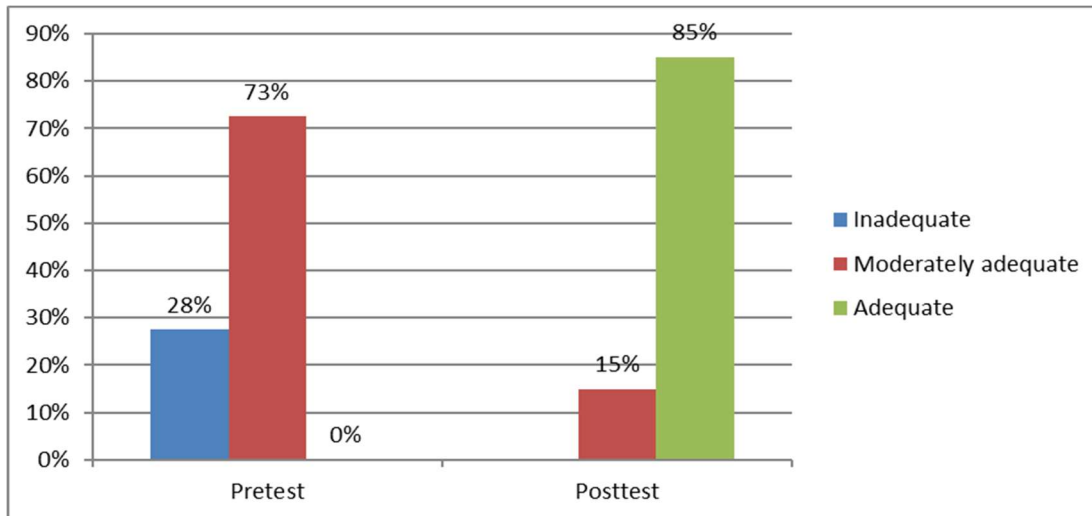


Figure 2.2

Table 2.2 and Fig 2.2 revealed that 27.5 % of the interventional group had inadequate knowledge, 72.5 % had moderately adequate knowledge, and 0 percent had adequate knowledge in the pretest. Following the post-test, 0% had inadequate knowledge, 15% had moderately adequate knowledge, and 85% had adequate knowledge.

Table 2.4: Assessment of knowledge among control group

N=80

S.No.	CRITERION	RANGE OF SCORE	PRE TEST KNOWLEDGE n= 40		POST-TEST KNOWLEDGE n= 40	
			f	%	f	%
1	Inadequate knowledge	0 – 10	9	22.5%	7	17.5%
2	Moderately adequate knowledge	11 – 20	31	77.5%	33	82.5%
3	Adequate knowledge	21 - 30	0	0%	0	0%

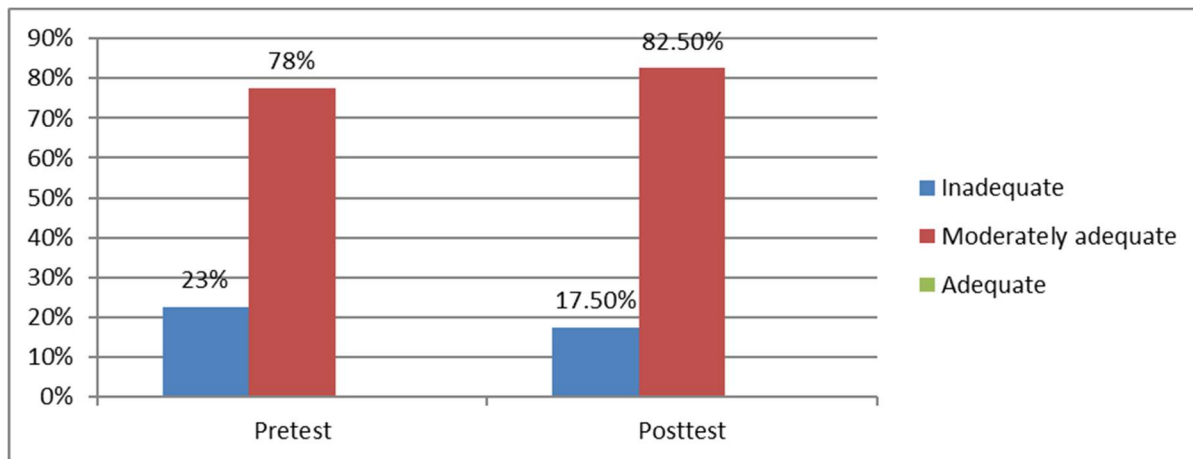


Figure 2.4

Table 2.4 and Fig 2.4 found that 22.5 % of the comparison group had inadequate knowledge, 77.5 % had moderately adequate knowledge, and 0 % had adequate knowledge at the time of the pretest. After the Post-Test, there were 22.5 % with inadequate knowledge, 82.5 % with moderately adequate knowledge, and 0% with adequate knowledge.

Table 3.1 Comparison between pre-post test of knowledge scores among Experimental group

N=80						
Experimental Group n=40	Mean	Std. deviation	Mean difference	"t" test/ critical value	Df	Inference / P value
Pre-test	12.00	2.55	11.85	44.17/3.64	39	Significant/ 0.000
Post test	23.85	2.98				

t test shows difference in pretest mean and posttest mean is highly significant ($p < 0.05$).

Experimental group	Knowledge score			Total
	Inadequate knowledge	Moderately adequate	Adequate knowledge	
Pre-test	11(27.5%)	29(72.5%)	0(0%)	40(100%)
Post-test	0(0%)	6(15%)	34(85%)	40(100%)

Table 3.1 revealed that in the intervention group, the efficiency of a structured teaching programme on VAP bundle knowledge in preventing ventilator-associated pneumonia was revealed; the mean of pre test was 12 and the mean of post-test was 23.85, with a paired t test value of 44.17 and $p = 0.000$ at the level of 0.05 it is highly significant.



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TABLE 3.2 Comparison between pre-post test of knowledge scores among control group

N=80						
Control Group n=40	Mean	Std. deviation	Mean difference	"t" test/ critical value	df	Inference / P value
Pre-test	12.40	2.71	0.57	2.80/1.69	39	Not Significant/ 0.08
Post test	12.97	2.45				

t test shows very less difference in pretest mean and posttest mean and is not significant ($P>0.05$).

Control group	Knowledge score			Total
	Inadequate knowledge	Moderately adequate	Adequate knowledge	
Pre-test	9(22.5%)	31(77.5%)	0(0%)	40(100%)
Post-test	7(17.5%)	33(82.5%)	0(0%)	40(100%)

Table 3.2 revealed statistically that no significant difference was there in control group, with a mean of pretest was 12.40 and a mean of post-test was 12.97, and a paired t test value of 2.80 and $p=0.08$ at the 0.05 significance level.

Table 3.3 Comparison between pre test of knowledge scores between experimental and control group

N=80						
Pre-test	Mean	Std. deviation	Mean difference	"t" test/ critical value	df	Inference / P value
Experimental group	12.00	2.55	0.40	0.66/2.02	39	Not Significant/ 0.51
Control group	12.40	2.71				

t test shows very less difference in pretest mean and posttest mean and is not significant ($P>0.05$).

Pre-test	Knowledge score			Total
	Inadequate knowledge	Moderately adequate	Adequate knowledge	
Experimental group	11(27.5%)	29(72.5%)	0(0%)	40(100%)
Control group	9(22.5%)	31(77.5%)	0(0%)	40(100%)

Table 3.3 revealed that there was no statically significant difference noted in pretest score of interventional and comparison group, interventional group pre test mean is 12.00 and control group pre test mean is 12.40 and paired t test value is 0.66 and $p=0.51$ at the level of 0.05 it is not significant.



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Table 3.4 Comparison between post test of knowledge scores between experimental and control group

N=80

Post test	Mean	Std. deviation	Mean difference	"t" test/ critical value	df	Inference / P value
Experimental group	23.85	2.98	10.88	16.39/3.64	39	Significant/ 0.00
Control group	12.97	2.45				

t test shows difference in pretest mean and posttest mean is highly significant ($p < 0.05$).

Post-test	Knowledge score			Total
	Inadequate knowledge	Moderately adequate	Adequate knowledge	
Experimental group	0(0%)	6(15%)	34(85%)	40(100%)
Control group	7(17.5%)	33(82.5%)	0(0%)	40(100%)

Table 3.4 revealed that the effectiveness of a structured teaching programme on knowledge about the VAP bundle in preventing ventilator-associated pneumonia was discovered in both the experimental and control groups; The post-test mean for the control group was 12.97, but the post-test mean for the experimental group was 23.85, with a paired t test value of 16.39 and $p = 0.000$ at the 0.05 significant level.

RESULT AND DISCUSSION

Major findings of the study

1. In the pre-test, the majority of students (72.5%) had moderate knowledge, while only 27.5 % had inadequate knowledge, and none had adequate knowledge. In the post-test, the majority of participants had adequate knowledge, with only 15% having moderately adequate knowledge and none having inadequate knowledge within the intervention group.
2. During the pre-test, the majority of students (77.5%) had moderately adequate knowledge, while only 22.5 % had inadequate knowledge and none had adequate knowledge. In the post-test, 82.5 % had moderately adequate knowledge, 17.5 % had inadequate knowledge, and none had adequate knowledge within the comparison group.
3. According to the findings, the structured teaching programme on VAP bundle knowledge in the prevention of ventilator-associated pneumonia had a mean post test knowledge score of 23.85, which was greater than the comparison group's mean post test knowledge score of 12.97, indicating that the structured teaching programme was effective. At the level of significance, the estimated t value ($t = 16.39$) greater than the table value (3.64). Hence hypothesis H_1 is accepted.
4. Table 3.1 revealed that the interventional group's level of post test for knowledge score (23.85) was greater than the mean score for pretest (12), by the mean difference of 8.2. It demonstrated the value of a structured teaching programme. The expected t-value ($t = 44.17$) was larger to the table value ($t_{39} = 3.64$) at the 0.05 level of significance, suggesting that the null hypothesis (H_{01}) was rejected and the data were statistically significant.

CONCLUSION

The study findings concluded that the Structured Teaching Program has improved the knowledge of nursing students regarding VAP bundle in prevention of ventilator associated pneumonia.



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