

A Study to Assess the Effectiveness of Self Instructional Module on Knowledge of Staff Nurses Working in Intensive Care Unit regarding Prevention of Ventilator Associated Pneumonia in Selected Hospitals at Jaipur City with a View to Prepare Clinical Practice Guideline

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Introduction: Ventilator associated pneumonia refers to a type of pneumonia that which is one of the most common nosocomial infections in patients receiving mechanical ventilation. Ventilator associated pneumonia occurs in 9-27% of all incubated patients.

Materials & Methods: evaluative approach was used with pre experimental one group pre and post test design was selected for the study. Setting of study was Jaipur Nursing College and hospital, MVG Hospital Dhand, Jaipur and Health Line Hospital Jaipur. The Sample size for the present study consists of 60 staff nurse working in intensive care unit. Purposive sampling technique was used in this study

Results: there is no significant association between pre test knowledge score and Professional Qualification and religion of respondents at df (3, 3 $p < 0.05$ level). There is no significant association between pre test knowledge score, Previous Knowledge of ventilator associated pneumonia of respondents at df(1 $p < 0.05$ level).

Conclusions: During pre test, most of the respondents showed inadequate knowledge of mean percentage is 88.33% and the maximum number of respondents has adequate knowledge in post test as evidenced by the overall mean percentage of 61.67%. There has been significant improvement in the level of knowledge of patients which indicates that the self instructional module was effective.

Keywords: Effectiveness; self instructional module; intensive care unit; ventilator associated pneumonia

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Introduction

Pneumonia is the second most common intensive care unit acquired infection caused by aerobic gram negative rods such as pseudomonas aeruginosa, acinetobacter species, klebsiella pneumoniae, and escherichia coli. Nearly 86% of nosocomial pneumonias are ventilator associated pneumonia and 10-20% of patients on mechanical ventilation for longer than 48 hours develop ventilator associated pneumonia.

Ventilator associated pneumonia is the most common nosocomial infection in the intensive care unit with an incidence ranging from 8% to 28% in incubated mechanically ventilated patients. Ventilator-associated pneumonia complicates the course of patients receiving mechanical ventilation in spite of major advances in techniques for its diagnosis and treatment.

Hospital-acquired pneumonia increases hospital stay by an average of 7–9 days per patient. The risk of ventilator associated pneumonia is highest early in the course of hospital stay, and is estimated to be 3% during the first 5 days of ventilation, 2% during 5–10 days of ventilation and 1% after 10 days of ventilation.

Ventilator associated pneumonia is or pharyngeal colonization by the endogenous flora or by pathogens acquired exogenously from the intensive care unit environment, especially the hands or apparel of health-care workers, contaminated respiratory equipment, hospital water, or air. The stomach represents a potential site of secondary colonization and reservoir of nosocomial gram-negative bacilli. Endotracheal-tube biofilm formation may play a contributory role in sustaining tracheal colonization and also have an important role in late-onset ventilator associated pneumonia caused by resistant organisms.

Due to increasing incidence of multidrug-resistant (MRD) organisms in ICUs, early and correct diagnosis of ventilator associated pneumonia is an urgent challenge for optimal antibiotic treatment. Ventilator associated pneumonia may be caused by a wide spectrum of bacterial pathogens, which may be polymicrobial and are rarely due to viral or fungal pathogens in immune-competent hosts.

The 2016 guide lines from “the centers for disease control and prevention” reported that 63% of patients admitted to an ICU have oral colonization with a pathogen associated with ventilator associated pneumonia. As the critically ill patients often have a depressed level of consciousness and an impaired gag reflex, leading to pooling of contaminated secretions in the posterior part of the oropharynx, which increases the risk of ventilator associated pneumonia in them.

Materials & Methods

Research approach:- The research approach adopted for the present study was evaluative approach.

Research design:- In the present study, pre experimental one group pre and post test design was selected for the study. The primary objectives of the study were to assess the effectiveness of self instructional module.

The design chosen for the study is presented in the table as:

Group	Pre test	Intervention	Post test
	O1	X	O2

Table 1- Pre- experimental one group pre and post test design.

Key:

- O1 - Assessment of knowledge by pre test.
- X - Provide the self instructional module regarding ventilator associated pneumonia.
- O2 - Assessment of knowledge by post test.

Research variable:-

- **Dependent variable:** In this study dependent variable is knowledge level of staff nurses regarding prevention of ventilator associated pneumonia.
- **Independent variable:** In this study independent variable is Self-Instructional Module regarding prevention of ventilator associated pneumonia.

Demographic variable: In this study the selected demographic variables are age in years, gender, and Professional qualification, religion, working experience in intensive care unit, and previous knowledge and source of information.

Research study of setting:- It refers to the physical location and conditions which data collection takes place in the study. The present study has been conducted in Jaipur Nursing college and hospital, MVG Hospital Dhand, Jaipur and Health Line Hospital Jaipur.

Target population: - In the present study the population, consists of staff nurses working in intensive care unit at selected hospital at Jaipur.

Sample and sample size:-The samples selected for the present study comprises of staff nurses working in intensive care unit MVG Hospital Dhand Jaipur and Health Line Hospital Jaipur. The Sample size for the present study consists of 60 staff nurse working in intensive care unit.

Sampling technique:- The process of sampling makes it possible to accept a generalization to the intended population based on careful observation of variables, within a relatively small proportion of population. In the present study 60 staff nurses were selected by purposive sampling technique.

Results

Presentation of the data

The findings are presented under the following headings:

- **Findings related to Area wise pre test knowledge score of respondents on prevention of pneumonia.**

Table 2: Area wise pretest knowledge score of respondents regarding Ventilator associated pneumonia (VAP).

N=60

Areas	Maximum Score	Mean	Mean Percentage	SD
Introduction of VAP	3	26	43.33%	3.4
Causes and risk factors of VAP	3	26.3	43.88%	6.3
Sign and symptoms of VAP	3	26.66	44.44%	2.68
Diagnostic test and management of VAP	3	22.66	37.77%	4.6
Prevention of of VAP	15	18.93	31.55%	6.70
Complication of of VAP	3	18	30%	6.5
Total	30	10.7	35.7	3.9

- Findings related to Area wise post test knowledge score of respondents on ventilator associated pneumonia.

Table 3: Area wise post test knowledge score of respondents regarding Ventilator associated pneumonia (VAP).

N=60

Areas	Maximum Score	Mean	Mean Percentage	SD
Introduction of VAP	3	59	48.33%	1
Causes and risk factors of VAP	3	54	90%	4
Sign and symptoms of VAP	3	48.66	81.11%	8.50
Diagnostic test and management of VAP	3	49.33	82.22%	7.70
Prevention of VAP	15	44.53	74.22%	5.59
Complication of VAP	3	43.33	72.22%	5.03
Total	30	23.85	79.5	3.2

Table 4: Distribution of respondents by the level of knowledge.

N=60

Level of knowledge	Score	Frequency		Percentage	
		Pre test	Post test	Pre test	Post test
Inadequate knowledge (0-50%)	0-15	53	0	88.33%	0%
Moderately adequate Knowledge (50-75%)	16-22	7	23	11.67%	38.33%
Adequate knowledge (75-100%)	23-30	0	37	0%	61.67%
Total	30	60	60	100%	100%

- Findings related to Effectiveness of self instructional module on knowledge of respondents regarding prevention of Ventilator associated pneumonia by comparing pre test knowledge score and post test knowledge score.

Table 5: Effectiveness of the self instructional module by comparing pre test knowledge score and post test knowledge score.

N=60

	Mean	Mean Percentage	SD	Enhancement	Enhancement percentage	df	t-value	Inference
Pre test	10.71	35.7	3.9	13.14	21.9%	60	20.21	S
Post test	23.85	79.5	3.2					

S = significant

ns = non significant

- Finding related to association between pre test knowledge scores with selected demographic variables

Table 6: Association between pre test knowledge with selected demographic Variables such as Age in Years and Gender

N=60

Variables	Below Median	Above Median	Total	Df	χ^2	P Value	Inference
1.Age in years							
21-25	16	17	33	3	2.27	7.81	NS
25-30	11	14	25				
30-35	1	0	1				
Above 35	1	0	1				
Total	29	31	60				
2.Gender							
Male	19	18	37	1	0.55	3.84	NS
Female	12	11	23				
Total	31	29	60				

S = Significant

NS = Non Significant

Table7: Association between pre-test knowledge score with demographic variables such as professional qualification and religion.

N=60

Variables	Below median	Above median	Total	Df	χ^2	P value	Inference
3.Professional Qualification							
GNM	21	21	42	3	0.30	7.81	NS
Post basic nursing	4	2	6				
B.Sc. nursing	6	6	12				
M.Sc. nursing	0	0	0				
Total	31	29	60				
4.Religion							
Hindu	18	18	36	3	0.15	7.81	NS
Muslim	2	2	4				
Sikh	0	0	0				
Christian	11	9	20				
Total	31	29	60				

S = Significant

NS = Non Significant

Table 8: Association between pre-test knowledge score with socio-demographic variables such as working experience in intensive care unit and Previous Knowledge of ventilator associated pneumonia.

N=60

Variables	Below median	Above median	Total	Df	χ^2	p value	Inference
5.Working experience in intensive care unit in years							
0-2	21	20	41	3	8.66	7.81	S
2-4	4	12	16				
4-6	2	0	2				
Above 6	1	0	1				
Total	28	32	60				
6. Previous Knowledge of ventilator associated pneumonia.							
Yes	1	3	4	1	1.24	3.84	NS
No	30	26	56				
Total	31	29	60				

S = Significant

NS = Non Significant

Conclusions

This study revealed that there is a no significant association between knowledge of respondents and demographic variables such as age (2.27), gender (0.55) professional qualification (0.30), and religion (0.15), previous knowledge regarding ventilator associated pneumonia (1.24) .Hence the research hypothesis is rejected at 0.05 level of significance.

During pre test, most of the respondents showed inadequate knowledge of mean percentage is 88.33% and the maximum number of respondents has adequate knowledge in post test as evidenced by the overall mean percentage of 61.67%. There has been significant improvement in the level of knowledge of patients which indicates that the self instructional module was effective.

Recommendations

Based on the findings of the study the following recommendations are put forward for future research.

- A similar study can be replicated on a large sample for wider generalization.
- A descriptive study can be done to find out the knowledge of staff nurses working in intensive care unit regarding prevention of ventilator associated pneumonia.
- An information book let can be developed based on the knowledge and practice learning needs of the staff nurses.
- Study can be conducted by including control and experimental group in the study.

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