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"A STUDY TO ASSESS THE EFFECTIVENESS OF NURSING INTERVENTIONAL PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA (VAP) AMONG STAFF NURSES WORKING IN ICU AT SELECTED HOSPITALS OF SOUTH GUJARAT"

MS. JAGRUTI S. TANDEL[1],
Corresponding Author
M.Sc Nursing, Department of Medical Surgical Nursing,
Sandra Shroff ROFEL College of Nursing, Vapi

MRS.SHEBA JOVERSE [2],
GUIDE
Assistant Professor, Medical Surgical Nursing Department, Sandra Shroff ROFEL College Of Nursing, Vapi

MR.SAJEER ALI NC [3],
GUIDE
Assistant Professor, Department of Medical Surgical Nursing, Sandra Shroff ROFEL College of Nursing, Vapi

ABSTRACT

Introduction; Ventilator-associated pneumonia is one of the most frequent nosocomial infections among ventilated patients in ICUs, associated with an increase in days of ICU stay, morbidity, and mortality. Its prevention is a significant concern in every hospital. The **objectives;** of the study is to evaluate the effect of nursing interventional Programme on knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU. **Method;** A Pre-experimental research design is subdivision of experimental research design. With experimental one group pre-test post-test research design was adopted for this study. A total of 50 staff nurses working in ICU were selected by non-probability convenience sampling technique. **Result;** The overall mean difference in knowledge between pre-test and post-test is 11.76 and overall mean difference in practice between pre-test and post-test is 5.48. The calculated 't' is 48.43 and the tabulated 't' is 1.684 P≤0.05 with DF of 49 level of significance of overall knowledge and in practice the calculated 't' is 29.73 and the tabulated 't' is 1.684 P≤0.05 with DF of 49 level of significance. The correlation (r) value 0.92 & 0.58 indicated positive correlation between pre-test and post-test knowledge and practice. In knowledge, chi-square values for educational status, years of experience, clinical experience in ICU and ICU training found that there is significant association between them. Hence hypothesis H3 is accepted. In practice, chi-square values for years of experience, clinical experience in ICU and ICU training were found that there is significant association between them. Hence hypothesis H3 is accepted. **Interpretation and conclusion;** Analysis data shows that Post-test level of knowledge and practice score is increased. Investigator concludes that nursing interventional programme can be an effective method of increased knowledge and practice regarding ventilator care bundle among staff nurses working in ICU.

Key words; ventilator care bundle; ventilator associated pneumonia; nursing interventional programme; knowledge, practice.

INTRODUCTION

Ventilator-associated pneumonia (VAP) is one of the most frequent nosocomial infections among ventilated patients in ICUs, associated with an increase in days of ICU stay, morbidity, and mortality. Its prevention is a significant concern in every hospital. Most of the interventions and prevention strategies are part of routine nursing care. 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.

Care "bundles" in infection prevention and safety are simple sets of evidence-based practices that, when implemented collectively, improve the reliability of their delivery and improve patient outcomes. A number of specific bundles are available that can be implemented at health care facilities in resource-limited settings.

The Ventilator Bundle components are as follows: elevation of the head of the bed to 30–45, oral care, suctioning, daily sedation vacation and daily, peptic ulcer disease prophylaxis, deep venous thrombosis (DVT) prophylaxis.

STATEMENT OF THE PROBLEM

"A STUDY TO ASSESS THE EFFECTIVENESS OF NURSING INTERVENTIONAL PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA (VAP) AMONG STAFF NURSES WORKING IN ICU AT SELECTED HOSPITALS OF SOUTH GUJARAT"

OBJECTIVES OF THE STUDY

1. To assess the level of knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU.
2. To evaluate the effectiveness of nursing interventional Programme on knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU.
3. To find the correlation between knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU.
4. To find the association between the pre-test level of knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia with selected demographic variable among staff nurses working in ICU.

ASSUMPTIONS

1. Staff nurse may have inadequate knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia.

2. Nursing interventional Programme improves the staff nurses knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia (VAP).

HYPOTHESIS

1. **H1:** There is a significant effectiveness of nursing interventional Programme on knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU at selected hospitals of south Gujarat at level of $p \leq 0.05$.
2. **H2:** There is a correlation between knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU.

3. **H3:** There is a significant association between Pre-test level of knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU with selected demographic variable at level of $p \leq 0.05$.

DELIMITATION:

The study is limited to,

1. A study is limited to 50 sample
2. Study is limited to 4 week of data collection
3. Study is limited to staff nurses working in ICU at selected hospital
4. Study is limited to those who are willing to participate

OPERATIONAL DEFINITION

1. **Assess:**
   In this study it refers to evaluate the level of knowledge and practice regarding ventilator care bundle in prevention of ventilator associated pneumonia through structured questionnaire and observational checklist.
2. **Effectiveness:**
   In this study effectiveness refers to determine the extent to which information in the nursing interventional program regarding ventilator care bundle in prevention of ventilator associated pneumonia has achieved the desired effect as expressed by gain in knowledge and practice score.
3. **Nursing interventional Programme:**
   In this study it refers to planned teaching the nurse to improve the knowledge, practice regarding ventilator care bundle in prevention of ventilator associated pneumonia.
4. **Knowledge:**
   The term knowledge refers to a theoretical or practical understanding of a ventilator care bundle in prevention of ventilator associated pneumonia.
5. **Practice:**
   In this study, it refers to action performed by the staff nurses working in ICU to prevent the ventilator associated pneumonia.
6. **Ventilator care bundle:**
   A cluster of four evidenced-based safety measures that decrease the risk to patients of mechanical ventilation while in the intensive care unit.
7. **Prevention:**
   In this study, it refers to action of stopping ventilator associated pneumonia from happening or arising.
8. **Ventilator associated pneumonia:**
   It is a type of lung infection that occurs in people who are on mechanical ventilator.

9. **Staff nurses:**

In this study refers to registered nurses working in medical/ surgical ICU.

RESEARCH METHODOLOGY

REASERCH APPROACH: Quantitative research approach

RESEARCH DESIGN: Pre-experimental ("One group Pre-test post-test research design")

VARIABLES:

Research variables:

- **Independent variable:** Nursing interventional Programme on ventilator care bundle in prevention of ventilator associated pneumonia
- **Dependent variable:** knowledge and practice of the staff nurses working in ICU on ventilator care bundle in prevention of ventilator associated pneumonia
- **Demographic Variables**: Age, sex, educational status, department, clinical experience, seminar/ CNE, critical care training.

RESEARCH SETTING: Selected Hospitals of south Gujarat

POPULATION AND SAMPLE

POPULATION: Staff nurse working in ICU
SAMPLE: 50 Staff nurse working in ICU at selected Hospitals of south Gujarat
SAMPLING TECHNIQUE: Non probability Convenience sampling technique
DESCRIPTION OF TOOL:

Final tool consisted of three parts:

SECTION- A: SOCIO- DEMOGRAPHIC DATA

It consist of selected socio demographical variable such as Age, sex, educational status, department, clinical experience, seminar/ CNE, critical care training

SECTION- B STRUCTURED KNOWLEDGE QUESTIONNAIRES

- It Consist of 30 structured knowledge questionnaires related to knowledge regarding ventilator care bundle in prevention of ventilator associated pneumonia.
- Structured knowledge questionnaire criteria:
  a) Ventilator associated pneumonia
  b) Ventilator care bundle

SECTION- C: OBSERVATIONAL CHECKLIST

SR.NO	ITEMS	YES	NO
1	**Elevation of the Head of Bed**		
	Do the nurse elevate the head of the bed to 30-45°?		
2	**Oral care with 1% chlorohexidine**		
	Position a patient in a semi recumbent		
	Hand washing before oral care		
	Apply clean gloves and rinse mouth with a clean swab		
	Provide oral care with chlorhexidine 1% according to hospital policy for mechanically ventilated patients		
	Clean equipment and return it to its proper place		
3	**Endotracheal and Tracheostomy Suctioning care**		
	Use of Closed system suctioning		
	Maintain adequate pressure in endotracheal tube cuff		
	use Saline/ distilled water prior to suctioning/ using sterile technique		
	Use appropriate size catheter during suctioning care		
	continuous aspiration of subglottic secretions if ventilator more than 48 hours		
4	**Sedation interruption Protocol**		
	Is the Implementation of daily sedation vacations based on the hospital's policy?		
	Does the nurse provide daily sedation vacations to mechanically ventilated patients according to policy?		
5	**Peptic ulcer prophylaxis**		
	Check the a contraindication of peptic ulcer prophylaxis based on the hospital's policy		
	Check the gastric residual volume every 4 to 6 hours		
	Administer intermittent rather than continuous enteral feeding		
	Perform routine acidification of gastric feeding		
	Deep vein thrombosis prophylaxis		

6	Does the nurse provide DVT prophylaxis as ordered by doctor?		
	Check there is any contraindication to deep vein thrombosis prophylaxis for mechanically ventilated patients		
	Apply anti-embolic stockings or sequential compression		

RESULTS

SECTION-I: DESCRIPTION DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS BASED ON PERCENTAGE AND FREQUENCY

SR NO	Variables	Category	Frequency	Percentage (%)
1.	**Age**	a) 21- 30 Years	**20**	**40%**
		b) 31- 40 Years	**19**	**38%**
		c) 41- 50 Years	**11**	**22%**
		d) ≥ 51 Years	**00**	**00%**
2.	**Gender**	a) Male	**07**	**14%**
		b) Female	**43**	**86%**
		c) Transgender	**00**	**00%**
3.	**Educational status**	a) GNM	**34**	**68%**
		b) B.Sc. Nursing	**14**	**28%**
		c) P.B.BSc. Nursing	**02**	**04%**
		d) M.Sc. Nursing	**00**	**00%**
4.	**Years of experience**	a) <1 Year	**14**	**28%**
		b) 1-5 Years	**12**	**24%**
		c) 6-10 Years	**12**	**24%**
		d) > 10 Years	**12**	**24%**
5.		a) < 1 Year	**14**	**28%**

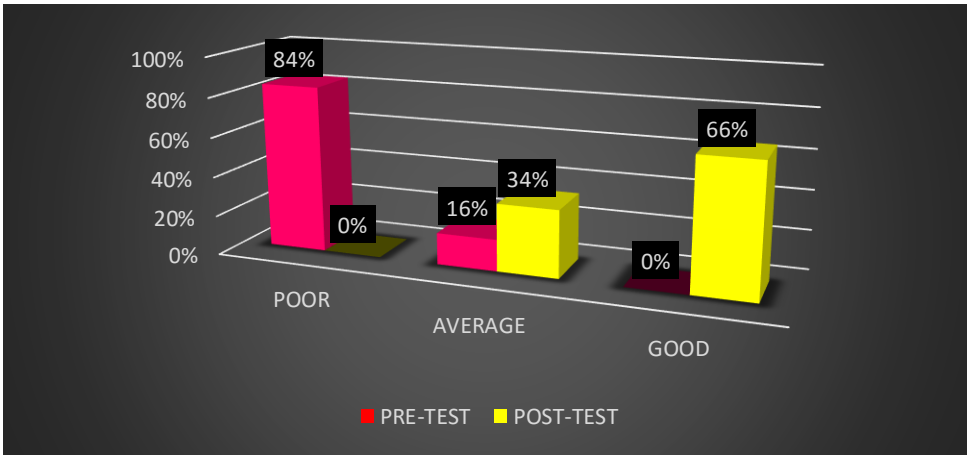
	Clinical experience in ICU	b) 1-3 Years	**05**	**10%**
		c) 4-6 Years	**10**	**20%**
		d) >6 Years	**21**	**42%**
6.	**Source of information**	a) Books/ journals	**22**	**44%**
		b) Health personnel	**20**	**40%**
		c) In service education	**08**	**16%**
		d) CNE/ Seminar	**00**	**00%**
7.	**ICU training**	a) Yes	**31**	**62%**
		b) No	**19**	**38%**

SECTION-II: COMPARISON OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE REGARDING VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA AMONG STAFF NURSES WORKING IN ICU

Observation (Knowledge)	SD	Mean	Mean Difference	Mean %	Calculated value of 't'	Table value of 't'	Inference
Pre-test	3.03	11.9	11.76	39.66	48.42	1.68	**S***
Post-test	2.77	23.66		78.86			

Note: S*- statistically significant t > 1.68 at 0.05 level.

GRAPH (1): COMPARISON OF PRE-TEST AND POST-TEST PERCENTAGE DISTRIBUTION OF LEVEL OF KNOWLEDGE OF THE STAFF NURSES OF ICU ON VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA



Graph-1: Comparison of pre-test and post-test percentage distribution of knowledge

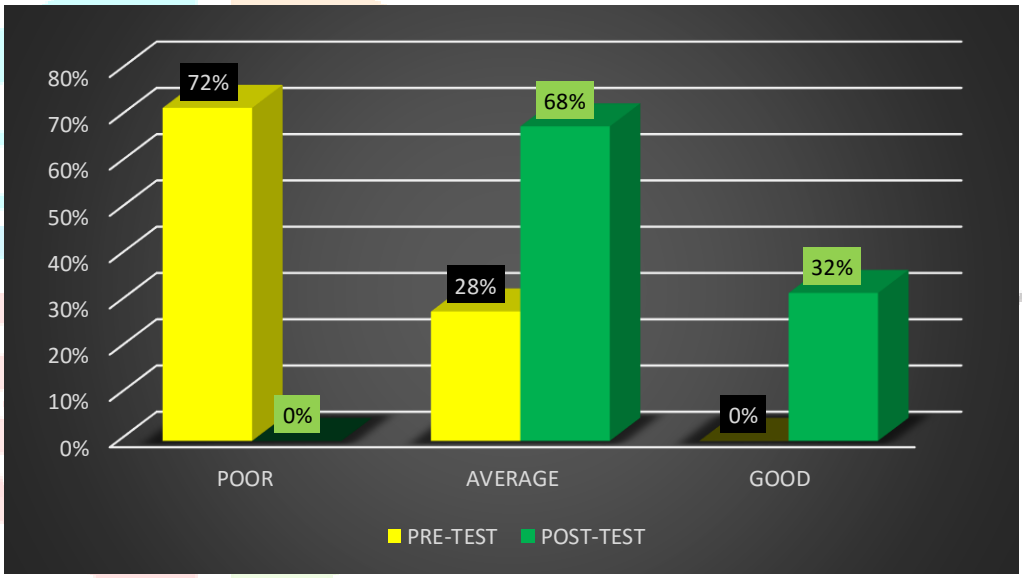
SECTION-III: COMPARISON OF PRE-TEST AND POST-TEST LEVEL OF PRACTICE OF THE STAFF NURSESIN ICU REGARDING VENTILATOR CARE BUNDL IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA

N=50

Observation (Practice)	SD	Mean	Mean difference	Mean %	Calculated value of 't'	Table value of 't'	Inference
Pre-test	1.99	9.02	5.48	45.1	29.61	1.68	**S**
Post-test	1.87	14.5		72.5			

Note: S*- statistically significant t > 1.68 at 0.05 level

GRAPH (2): COMPARISON OF PRE-TEST AND POST-TEST PERCENTAGE DISTRIBUTION OF LEVEL OF PRACTICE OF THE STAFF NURSES OF ICU ON VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA



Graph-2: Comparison of pre-test and post-test percentage distribution of practice

SECTION-IV: CORRELATION BETWEEN KNOWLEDGE AND PRACTICE SCORE REGARDING VENTILATOR CARE BUNDLE IN PREVENTION ON VENTILATOR ASSOCIATED PNEUMONIA AMONG STAFF NURSES WORKING IN ICU

N=50

	Total Knowledge Score	Total Practice Score	Correlation (r)	Findings
PRE TEST	595	450	**0.92**	**Positive Correlation**
POST TEST	1183	725	**0.59**	**Positive Correlation**

SECTION-V: ASSOCIATION BETWEEN KNOWLEDGE REGARDING VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA AMONG STAFF NURSES WORKING IN ICU WITH SELECTED DEMOGRAPHIC VARIABLES

SR NO	VARIABLES	CATEGORY	TOTAL SCORE		DF	TABLE VALUE	CHI-SQUARE	INFERENCE
			< M	≥ M				
1.	Age	a) 21- 30 Years	10	9	2	5.99	2.807	NS
		b)31- 40 Years	6	14				
		c)41- 50 Years	3	8				
		d)≥ 51 Years	0	0				
2.	Gender	a)Male	4	3	1	3.84	0.571	NS
		b)Female	18	25				
		c) Transgender	0	0				
3.	Educational status	a)GNM	19	15	2	5.99	6.414	S
		b)B.Sc. Nursing	3	11				
		c)P.B.BSc. Nursing	0	2				
		d)M.Sc. Nursing	0	0				
4.	Years of experience	a)<1 Year	11	4	3	7.81	15.63	S
		b)1-5 Years	5	7				
		c)6-10 Years	4	6				
		d)> 10 Years	0	13				
5.	Clinical experience in ICU	a)< 1 Year	10	4	3	7.81	19.13	S
		b)1-3 Years	3	2				
		c)4-6 Years	6	4				
		d)>6 Years	1	20				
6.	Source of information	a)Books/ journals	10	10	2	5.99	2.753	NS
		b)Health personnel	10	13				
		c)In service education	1	6				
		d)CNE/ Seminar	0	0				
7.	ICU training	a)Yes	4	23	1	3.84	15.51	S
		b)No	16	7				

SECTION-VI: ASSOCIATION BETWEEN PRACTICE REGARDING VENTILATOR CARE BUNDLE IN PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIAAMONG STAFF NURSES WORKING IN ICU WITH SELECTED DEMOGRAPHIC VARIABLES

SR NO	VARIABLES	CATEGORY	TOTAL SCORE		DF	TABLE VALUE	CHI-SQUARE	INFERENCE
			< M	≥ M				
1.	Age	a) 21- 30 Years	10	9	2	5.99	3.695	NS
		b)31- 40 Years	5	15				
		c)41- 50 Years	3	8				
		d)≥ 51 Years	0	0				
2.	Gender	a)Male	4	3	1	3.84	1.182	NS
		b)Female	14	29				
		c) Transgender	0	0				
3.	Educational status	a)GNM	15	19	2	5.99	2.294	NS
		b)B.Sc. Nursing	4	10				
		c)P.B.BSc. Nursing	0	2				
		d)M.Sc. Nursing	0	0				
4.	Years of experience	a)<1 Year	12	3	3	7.81	16.29	S
		b)1-5 Years	3	9				
		c)6-10 Years	2	8				
		d)> 10 Years	2	11				
5.	Clinical experience in ICU	a)< 1 Year	10	4	3	7.81	22.4	S
		b)1-3 Years	2	3				
		c)4-6 Years	5	5				
		d)>6 Years	1	20				
6.	Source of information	a)Books/ journals	10	10	2	5.99	3.443	NS
		b)Health personnel	7	16				
		c)In service education	1	6				
		d)CNE/ Seminar	0	0				
7.	ICU training	a)Yes	3	24	1	3.84	18.01	S
		b)No	16	7				

DISCUSSION

Section-I: Frequency and percentage distribution of samples based on demographic variables.

Finding reveals that majority 86% of staff nurses working in ICU are females and 14% are male. The result is supported with a Similar study conducted by Rakhi Mishra on knowledge and practice regarding ventilator care bundle on prevention of ventilator associated pneumonia among nurses. In that the majority of sample was female.

Educational status wise distribution shows that, majority 68% of samples are GNM nurses, 28% samples are B.Sc.Nursing graduates and 4% completed P.B.B.Sc.Nursing. The result is supported with a Similar study conducted by chithra R. on knowledge regarding prevention of ventilator associated pneumonia among critical care nurses. In that the majority of sample were GNM.

SECTION-II: Comparison of pre-test and post-test level of knowledge regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU

pre-test mean percentage was 39.66 % which was significantly increased to 78.86 % in the post test. The standard deviation of the pre-test level of knowledge regarding ventilator care bundle in prevention ventilator associated pneumonia was 3.03 and post-test was 2.77. The Mean pre-test level of knowledge regarding ventilator care bundle in prevention ventilator associated pneumonia was 11.9 which is significantly improved to 23.66 in post-test with a mean difference of 11.76. The computed value of t = 48.42 which is greater than the table value of t = 1.68at the level of $p \leq 0.05$. Hence, hypothesis H1is accepted. The result is supported with a Similar study conducted by Rakhi Mishra on knowledge and practice regarding ventilator care bundle on prevention of ventilator associated pneumonia among nurses. In that the 't' test of knowledge calculated value was highly significant at $p \leq 0.05$.

SECTION-III: Association between knowledge regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurses working in ICU with selected demographic variable

- The chi-square value shows that there is an association of level of knowledge among staff nurses working in ICU with educational status, years of experience, clinical experience in ICU and ICU training.
- The chi-square value shows that there is no association of level of knowledge among staff nurses working in ICU with age, gender and source of information

The result is supported with similar study findings of chithra R. on knowledge regarding prevention of ventilator associated pneumonia among critical care nurses. In that the association with selected demographic variables educational status and working experience is significant at $p \leq 0.05$ level.The result is supported with a Similar study conducted by Priyanka pandhare on knowledge regarding prevention of ventilator associated pneumonia among critical care nurses. In that the years of experience in ICU is significant with selected demographical variables at $p \leq 0.05$ level.

CONCLUSION

A Quantitative approach, (one group pre-test post-test design) Pre-Experimental research study was conducted on a sample of 50 staff nurses working in ICU through convenience sampling technique using structured questionnaires and observational checklist to assess the level of knowledge and practice regarding Ventilator care bundle. The data collection of Period is 4 weeks from 28/12/2020 to 28/01/2021 at selected Hospitals of south Gujarat. In the mean pre-test score of the level of knowledge and practice was 11.9, 9.02 respectively which is significantly changed to 23.66, 14.5 after the intervention. And the t test score shows that, there is a significant effectiveness of nursing interventional Programme on knowledge and practice

regarding ventilator care bundle in prevention of ventilator associated pneumonia among staff nurse working in ICU.

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