



“Effect Of Structured Educational Programme Regarding Prevention Of Ventilator Associated Pneumonia Among Staff Nurses In a Selected Hospital at Palakkad District.”

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ABSTRACT

The present study was aimed to assess the effect of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses in PKDIMS. The objectives of this study were to assess the level of knowledge regarding prevention of ventilator associated pneumonia among staff nurses, find the effectiveness of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses and find the association between pretest level of knowledge with selected demographic variables. The research approach was quantitative and the research design adopted was one group pre-test post-test research design. Sixty staff nurses selected by purposive sampling technique. Data was collected using structured questionnaire. The study was based on Rosen stock's health belief model the result shows that the obtained “t” value for nursing staff knowledge of ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staffs exposed to the structured educational programme had significant increase in post test knowledge. The Chi square test value shows that there is no association between level of knowledge with the demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

Key words: Structured educational programme, Ventilator, Pneumonia

INTRODUCTION

BACKGROUND OF THE STUDY

Pneumonia is an acute infection of the lung parenchyma. It is the leading cause of death in developing countries, especially in children. In 2016 it accounted for nearly 16% of total under five deaths in the world.¹

Ventilator associated pneumonia, refer to pneumonia that occur more than 48hours after endotracheal intubation. Ventilator associated pneumonia continue to be a major cause of morbidity, mortality and increased financial burden in ICU. Over the years there has been a significant advance in our understanding of ventilator associated pneumonia. The risk for ventilator associated pneumonia is the highest in the patient requiring mechanical ventilation because the tracheostomy tube by passes normal upper airway defenses. In addition, a poor nutritional state, immobility and underlying disease process (example: Immunosuppression, organ failure) make the patient is more prone to infection.²

A staff nurse is a generalized job description of someone who works in a health care setting or facility. She/he works side by side with members of the health care team to treat and manage patients' conditions across age groups. Staff nurses play a vital role in prevention of ventilator associated pneumonia. Staff nurses play a vital role in prevention of ventilator associated pneumonia.

Ventilator associated pneumonia is one of the most frequent ICU -acquired infection. Reported incidence vary widely from 5-40% depending on the setting and diagnostic criteria .Recent advances in microbiology tools the epidemiology and diagnostic criteria for ventilator associated pneumonia are still controversial ,complicating the interpretation of treatment prevention and outcome studies .ventilator associated pneumonia. Imposes a significant economic burden. The daily risk of ventilator associated pneumonia peaks between days 5-9 of mechanical ventilation, whereas the cumulative incidence is closely related to total duration of mechanical ventilation.

The most common cause of ventilator associated pneumonia is micro aspiration of bacteria that colonize the oropharynx and upper airway in seriously ill patient.

Critical care nurses play an important role in prevention of ventilator associated pneumonia by preventing the patient from risk factor, notifying early symptoms of ventilator associated pneumonia in patients and assisting in diagnosis. Nurses are health care providers who protect patients from infection. So, lack of knowledge about the prevention of infection and proper nursing care may become barrier to prevent ventilator associated pneumonia. The occurrence of ventilator associated pneumonia indicates inadequate of experienced nurses, insufficient knowledge and understanding about the pathophysiology and prevention of ventilator associated pneumonia.⁴

The spread of ventilator associated pneumonia may be due to ICU nurses contact with the patients receiving care of mechanical ventilation and their contact with nursing students, visitors and healthcare workers moreover they are responsible for delivering nursing care to patient. As nurses deliver care related

to mechanical ventilation, they should have appropriate knowledge regarding ventilator modes, positive pressure ventilation, daily weaning process, aspiration prevention and head on the bed elevation.⁶

NEED AND SIGNIFICANCE OF THE STUDY

Ventilator associated pneumonia, are the most common and most preventable complication of a patient's hospital stay. Their frequency and potential adverse effects increase in critically ill patients because of impaired physiology, including a blunted immune response and multi organ dysfunction.

Traditionally, ventilator associated pneumonia rates have been measured as an indicator of quality of care. Despite recent initiatives to measure complications of mechanical ventilation and a decrease in incidence over the past few years, ventilator associated pneumonia remains an issue for critically ill adults, with mortality estimated as high as 10%.

Nurses have different vital roles such as care provider manager, educator, coordinator and evaluator in preventing ventilator associated pneumonia. 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. This study will help nurses to know about ventilator associated pneumonia and its prevention in detail so that they can apply the knowledge in clinical practice. Understanding pathophysiology of ventilator associated pneumonia, its risk factor and care bundle is vital for the proper prevention and treatment of ventilator associated pneumonia. There must be specific protocols, strategies and active surveillance in every ICU regarding the care bundle.

For the prevention and reduction of ventilator associated pneumonia, the successfully multidisciplinary approaches should be applied in ICUs and education should be provided for all healthcare providers focusing on the risk factors and preventive measures of ventilator associated pneumonia.⁵

This study is taken to assess the competency of ICU nurses as they are at the patient's bedside round the clock and therefore they play an important role in the prevention of ventilator associated pneumonia. Nevertheless nurses needed to have an awareness of the problem as well as knowledge on the prevention strategies so as to adhere to preventive practices by using ventilator associated pneumonia bundle. Skilled and knowledgeable nurses are extremely important to make appropriate decisions in patient care and minimize risks to patients and bring confidence to make appropriate decision and prevent poor outcomes in the recovery of mechanically ventilated patients.⁷

PURPOSE OF THE STUDY

To determine the effect of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses.

STATEMENT OF THE PROBLEM

Effect of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses in Thrissur district .

OBJECTIVES

1. Assess the level of knowledge regarding prevention of ventilator associated pneumonia among staff nurses.
2. Find the effectiveness of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses
3. Find the association between pretest level of knowledge with selected demographic variables

OPERATIONAL DEFINITION

1. Effect

It refers to result obtained from structured educational programme regarding ventilator associated pneumonia among staff nurses

2. Structured educational programme

It refers to an educational programme designed to provide knowledge about ventilator associated pneumonia for staff nurses

3. Prevention

It refers to action that helps to inhibit the development of ventilator associated pneumonia in patients on mechanical Ventilator

4. Ventilator associated pneumonia

It refers to the pneumonia associated with mechanical ventilation that develops within 48hours or more of the hospital admission and which was not developing at the time of admission

5. Staff nurses

It refers to a person who has successfully completed the nursing course from Indian nursing council registered colleges and registered in state nursing council

HYPOTHESIS

H₀: There is no significant difference between pretest and post test score

H₁: There will be significant difference between pretest and post test score

H₂: There will be significant association between pretest level of knowledge and selected demographic variables

REVIEW OF LITERATURE

. 1.Studies related to general studies of ventilator associated pneumonia

Jean chastre and jean yver fagon, conducted a study on ventilator associated pneumonia that continuous to complicate the course of 8 to 28%of patients receiving mechanical ventilation. It is a quantitative descriptive research studies by the use of validated tool. In conclusion the mortality rate of ventilator associated pneumonia ranges from 24 to 50% and can reach 76% in some specific settings as when lung infection is caused by high risk pathogens.¹³

Mona Bingham, Jeffery Ashley Marta de jong, Caren conducted a study on implementing a unit level intervention to reduce the probability of ventilator associated pneumonia .The purpose of this study was to evaluate the effectiveness of a unit -specific education intervention that emphasised hand hygiene, head of the bed elevation and oral care .Two hour observations were conducted on a convenience sample of 100 ventilated patients not diagnosed with ventilator associated pneumonia and the clinical staff that interacted with them .In conclusion the ventilator associated pneumonia and the ventilator dry rates did not improve significantly there were no significant changes in clinician adherence to hand hygiene -provision of oral care as patient position.¹⁴

Neelima Ranjan,Uma Chaudhary and K.P Ranjan conducted a study on ventilator associated pneumonia in a tertiary care intensive care unit .analysis of incidence risk factors and mortality .this prospective observational study was carried out over a period of one year .Ventilator associated pneumonia was diagnosed using the clinical pulmonary infection scale .The incidence of ventilator associated pneumonia was 57.14% study showed that the incidence of ventilator associated pneumonia is directly proportional to the duration of mechanical ventilation .the most common pathogen causing ventilator associated pneumonia were Acetobacter spp and pseudomonas aeruginosa were associated with a high fatality rate.¹⁵

2. Studies related to preventive measures of ventilator associated pneumonia.

Vajihe Atashi Hujatallah conducted a study regarding the barriers to the prevention of ventilator associated pneumonia from the prospective of critical care nurses. It is a qualitative descriptive study . In conclusion the barriers to the prevention of ventilator associated pneumonia in ICU are very diverse and complex and include a wide range of interacted personal, environmental and organizational barriers.¹⁹

Magda M. Azzab, Rehab H.Ei Sökkary, Mohammed M Tawfeek and Manar G.Gebrief conducted a study on prevention of ventilator associated pneumonia in an emergency Intensive care unit: an intervention study. The study showed a significant reduction in ventilator associated pneumonia rates with evidence based prevention strategies .klebsilla was the most prevalent pathogen responsible for ventilator associated pneumonia.multifacted intervention is a key stategy to prevent ventilator associated pneumonia.²⁰

3. Studies related to structured teaching on prevention of ventilator associated pneumonia.

Rakhi Mishra and Navita Rani conducted a study on effectiveness of structured teaching program on knowledge and practice regarding care bundle on prevention of ventilator associated pneumonia among nurses .pre experimental one group pre-test and post- test design was adopted to accomplish the objective .The mean pre-test knowledge and practice scores were 7.79 and 10.33 respectively. The study findings conducted that the structured teaching programme has improved the knowledge and practice of nurses regarding the case bundle on prevention of ventilator associated pneumonia.²⁴

Chithra R.A and Janula raju conducted a study on effect of structured teaching programme on knowledge regarding prevention of ventilator associated pneumonia among critical care nurses. The objective of this study to determine the existing knowledge and to evaluate the effectiveness of structured teaching programme on knowledge regarding prevention of ventilator associated pneumonia. One group pre-test and post – test design was used. The finding revealed that there was a marked increase in the overall knowledge scale of post-test than pre-test scale. ²⁵

METHODOLOGY

Research approach

Quantitative research approach is adopted for this study.

Research design

. The research design used for this study was one group pre-test post-test research**Dependent variables:-**

. Dependent variable of this study was the knowledge level on ventilator associated pneumonia.

Independent variable:-

. In this study the independent variable is structured education.

Demographic variable:-

Age, gender, educational qualification, present working area, year of experience and previous knowledge.

SETTING OF THE STUDY

The study conducted among the staff nurses in PKDIMS.

POPULATION

Population is a complete set of persons or objects that possess some characteristic of interest to the researcher. The populations for this study consist of all the staff nurses in PKDIMS.

SAMPLE AND SAMPLING TECHNIQUE

The sample of the present study consist of 60 staff nurses in PKDIMS who works in MICU, SICU,CCU, Wards and casualty. The sampling technique adopted for the present study was purposive sampling technique.

INCLUSION CRITERIA:-

Staff nurses among PKDIMS who are willing to participate in the study Staff nurses in PKDIMS who have 5 year experience.

EXCLUSION CRITERIA:-

Staff nurses are not willing to participate in the study.
Staff nurses who have more than 5 year experience.

TOOLS AND TECHNIQUE

Development of tool:-

The tool used in the study was structured questionnaire.

Section A: - structured questionnaire to assess the demographic variables.

- ❖ It includes: age, gender, educational qualification, present working area, year of experience, previous knowledge.

Section B: - Structured questionnaire to assess the knowledge regarding the prevention of ventilator associated pneumonia. It was a questionnaire prepared by investigator after an extensive review of literature on prevention of ventilator associated pneumonia.

- ❖ It consists of 24 questions regarding pneumonia and ventilator associated pneumonia.
- ❖ Each question has 4 options.
- ❖ The score for each correct response was 1 and incorrect response was 0.
- ❖ The maximum possible score was 24.

The obtained knowledge score was graded as follows:

LEVEL OF KNOWLEDGE	RANGE
Excellent knowledge	19-24
Good knowledge	13-18
Moderate knowledge	7-12
Poor knowledge	1-6

PILOT STUDY

The pilot study was done among staff nurses in Lakshmi hospital Palakkad. Investigator selected 6 subjects based on inclusion criteria using purposive sampling technique.

DATA COLLECTION PROCESS

Formal permission was obtained from the administrative authorities of PKDIMS. The sample of 60 staff nurses who fulfill the inclusion criteria were selected using purposive sampling technique. Pretest level of knowledge and practice were assessed using structured questionnaire. After that provided education regarding the prevention of ventilator associated pneumonia .Post test was conducted using the same tool after 12 days, through using structured questionnaire.

PLAN FOR DATA ANALYSIS

The data obtained was analyzed on the basis of the objectives of the study using descriptive and inferential statistics.

DESCRIPTIVE STATISTICS:-

Frequency and percentage distribution were Used to study the selected demographic variables.

INFERENCE STATISTICS:-

Paired 't' test and chi square test was used to find out the association of knowledge with selected demographic variables. The findings of the study were presented in the form of tables and figures.

ANALYSIS AND INTERPRETATION

This study is designed to assess the effect of structured education regarding ventilator associated pneumonia among staff nurses in PKDAS INSTITUTE OF MEDICAL SCIENCE. Data was collected from 60 samples which full filled the inclusion criteria. The data was tabulated analyzed and interpreted using descriptive and inferential statistics.

Objectives

1. To assess the level knowledge regarding prevention of ventilator associated pneumonia among staff nurses.
2. To find the effectiveness of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses
3. To find the association between pre tests level of knowledge with selected socio demographic variables.

Presentation of data

Section 1: Distribution of staff nurses based on selected socio demographic variables.

Section 2: assessment of level of knowledge regarding ventilator associated pneumonia among staff nurse.

Section 3: Effect of structured education on ventilator associated pneumonia among staff nurses.

Section 4: Association between level of knowledge and selected demographic variables.

SECTION 1:

Distribution of staff nurses according to socio demographic variables.

The section one deals with frequency and percentage distribution of staff nurses. According to state of socio demographic variables such as age in year, sex, educational qualification, present working area, year of experience and previous knowledge

Table 1: Frequency and percentage distribution of staff nurses**according to age in year.**

(n=60)

Variable(age in year)	Frequency	Percentage
21-25	19	31.6
26-30	25	41.6
31-35	10	16.6
36-40	6	10

Table 1: reveals that majority (41.6%) of the subjects were in the age group of 26-30 years . 31.6% of the subjects were in 21-25 years, 16.65 of the subjects were in 31-35 years and 10% of the subjects were in the age group of 36-40 years

Table 2: Frequency and percentage distribution of staff nurses according to**sex.**

(n=60)

Variables (sex)	Frequency	Percentage
Male	0	0
Female	60	100
Transgender	0	0

Table 2 reveals that majority (100%) of the subjects were in the gender group of female.

Table 3: Frequency and percentage distribution of staff nurses according to**educational qualification.**

(n=60)

Variables(education qualification)	Frequency	Percentage
GNM	27	45
Post BSc	7	11.7
BSc	26	43.3
MSC	0	0

Table 3: reveals that the majority (45%) of the subjects was having education qualification as GNM, 43.33% of subjects were having education qualification as BSC and 11.7% of subjects were having education qualification as post BSC.

Table 4: Frequency and percentage distribution of staff nurses according to present working (n=60)

Variable(present Frequency percentage working area)		
MICU	16	26.7
SICU	10	16.7
CCU	2	3.3
Ward	32	53.3
Casualty	0	0

Table 4: reveals that majority (53.3%) of the subjects were from working in wards ,26.7% of the subjects were from working in MICU.16.7% of subjects were from working inSICU,3.3% of subjects were from working in CCU and 0% of subjects were from working in casualty.

Table 5: Frequency and percentage distribution of staff nurses according to year of experience. (n=60)

Variable(year of experience)	Frequency	Percentage
<3	21	35
>3	39	65

Table 5: reveals that majority 65% of subjects were having >3 years of experience and 35% of subjects were having <3 years of experience.

Table 6: Frequency and percentage distribution staff nurses according to previous knowledge (n=60)

Variable(previous knowledge)	Frequency	Percentage
Books`	20	33.4
Newspapers	6	10
Journals	0	0
Life experience	34	56.6

Table VI reveals that majority 56.6 % of subjects were having previous knowledge from life experience, 33.4% of subjects were having previous knowledge from books and 10% of subjects were having previous knowledge from newspapers.

SECTION II :**Table 7: Assessment of level of knowledge regarding ventilator associated pneumonia among staff nurses**

Variable	Frequency	Percentage
Poor knowledge	1	1.6%
Moderate knowledge	12	20%
Good knowledge	36	60%
Excellent knowledge	11	18.4%

Pre test level of knowledge regarding ventilator associated pneumonia among 60 staff nurses,1.6% of staff nurses having poor knowledge, 20% of staff nurses having moderate level of knowledge, 60% of staff nurse having good knowledge and 18.4% staff nurses having excellent knowledge.

SECTION III:**Effect of structured education on ventilator associated Pneumonia among staff nurses**

This section deals with the analysis of effectiveness of structured educational programme on knowledge on ventilator associated pneumonia among staff nurses by calculating mean, standard deviation and t value of knowledge.

Table 8: Mean standard deviation and t value of knowledge scores of staff nurses

Variables	Mean	Standard deviation	t value	p value
Pre test	14.7	3.28	16.61	0.0001**
Post test	22.8	1.07		

**significant at 0.0001 level

The above table 8: shows that the obtained “t” value for nursing staffs knowledge of ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staffs exposed to the structured educational programme had significant increase in post test knowledge.

SECTION IV:**Association between level of knowledge and selected Demographic variables**

This section deals with association between level of knowledge and demographic variables such as age, sex, educational qualification, present working area , year of experience and previous knowledge.

Table 9: Association between levels of knowledge with age in years

Variables	Level of knowledge				Chi square	P value	knowledge	knowledge	
	Poor knowledge	Moderate knowledge	Good knowledge	Excellent knowledge					
21-25	0	3	14	2					
26-30	1	5	13	6	0.21	16.92			
31-35	0	3	4	3	36-40	0	1	5	0

Table 9: shows that chi square test value of level of knowledge with age in years and p value is 16.92. There is no association between levels of knowledge with age in years.

Association between levels of knowledge with sex

In this present study all the staff nurses are females. The chi square test value was not obtained as there was no male staff nurse

Table 10: Association between levels of knowledge with educational qualification

Variables	Level of knowledge				Chi square
	Poor knowledge	Moderate knowledge	Good knowledge	Excellent knowledge	
Educational qualifications					
GNM	0	3	20	4	2.75
Post BSc	0	4	2	1	
BSc	1	5	14	6	

The table x shows that chi square test value of level of knowledge with educational qualification is 2.75. There is no association between level of knowledge with educational qualification.

Table 11: Association between levels of knowledge with present working area

Variables	Level of knowledge				Chi square
	Poor knowledge	Moderate knowledge	Good knowledge	Excellent knowledge	
Present working area					
MICU	0	2	12	2	3.1
SICU	0	3	4	3	
CCU	1	0	1	0	
WARD	0	7	19	6	

Table 11: shows that chi square test value of level of knowledge with present working area is 3.1. There is no association between levels of knowledge with present working area.

Table 12: Association between levels of knowledge with year of experience.

Level of knowledge					Variables			
Poor	Moderate	Good	Excellent	Chi square	P value	knowledge	knowledge	knowledge
>3	1	7	21	10				
<3		0	5	15	1	2.1	7.82	

Table 12: shows that chi square test value of level of knowledge with year of experience and is 2.1. There is no association between levels of knowledge with year of experience.

Table 13: Association between levels of knowledge with previous knowledge

Level of knowledge					Variables			
Poor	Moderate	Good	Excellent	Chi square	P value	knowledge	knowledge	knowledge
Books	0	3	14	3				
Newspapers		0	3	3	1	2	1.43	
Life experiences		1	6	6	12	6		

Table 13: shows that chi square test value of level of knowledge with previous knowledge is 1.43. There is no a association between level knowledge with previous knowledge

HYPOTHESES TESTING

H₁: There will be a significant difference between pre-test and post-test score.

H₀: There is no significant difference between pre-test and post-test score.

H₂: There will be significant association between pre-test level of knowledge and selected demographic variables.

The “t” value for nursing staff knowledge regarding ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staff exposed to the structured educational programme had significant increase in post- test knowledge. Hence Hypothesis H₁ is accepted and H₀ is rejected.

Study shows that there will be no significant association between pre-test level of knowledge with selected demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

RESULTS

The findings of the study are presented under the following headings.

Section 1: Distribution of staff nurses based on a selected Socio demographic Variables

Regarding the age: It reveals that majority (41.6%) of the subjects were in the age group of 26-30 years. 31.6% of the subjects were in 21-25 years, 16.65 of the subjects were in a 31-35 years and 105 of the subjects were in the age group of 36-40 years respectively.

Regarding the sex : (100%) were female.

Regarding the educational qualification: It reveals that the majority (45%) of the subjects were having educational qualification as GNM , 43.33% of subjects were having educational qualification as BSc and 11.7% of subjects were having education qualification of Post Basic BSc.Nursing.

Regarding the present working area: According to this majority of the subjects (53.3%) were working in wards, 26.7% of the subjects were working in MICU, 16.7% of subjects were from working in SICU, 3.3% of subjects were from working in CCU.

Regarding year of experience: It reveals that majority (65%) of subjects were having > 3 year of experience and 35% of subjects were having <3years of experience.

Regarding previous knowledge : It shows that majority (56.6%) of subjects were having previous knowledge from life experience, 33.4% of subjects having previous knowledge from books and 10% of subjects having previous knowledge from newspapers.

Section 2: Assessment of level of knowledge regarding ventilator associated Pneumonia among staff nurses.

Pre -test level of knowledge regarding ventilator associated pneumonia among 60 staff nurses, 1.6% of staff nurses having poor knowledge, 20% of staff nurses having moderate level of knowledge, 60% of staff nurses having good knowledge and 18.4% staff nurses having excellent knowledge.

Section 3 : Effect of structured education regarding ventilator associated Pneumonia among staff nurses

The “t” value for nursing staff knowledge regarding ventilator associated pneumonia value in 16.61 significant at 0.05 level . It is inferred that the nursing staff exposed to the structured educational programme had significant increase in post- test knowledge.

Section 4: Association between level of knowledge and selected socio demographic variables

There were no association between level of knowledge and selected socio- demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

Discussion

The purpose of the study was to assess the effectiveness of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses. The sample was selected by purposive sampling technique. The data was collected from 60 staff nurses by structured knowledge questionnaire to assess the knowledge of ventilator associated pneumonia.

The result shows that the obtained “t” value for knowledge of ventilator associated pneumonia value is 16.61 significant at 0.05 level. It is inferred that nursing staff exposed to the structured education programme had significant increase in post test knowledge.

Findings related to distribution of staff nurses according to age

In the present study majority (41.6%) of samples were in the age group of 26 to 30 years. A study conducted in Kirkuk city hospitals among 30 intensive care staff nurses regarding the knowledge of ventilator associated pneumonia, the majority (46.7%) of the age group were 24-29 years old.

Findings related to distribution of staff nurses according to gender

In the present study majority of (100%) the subjects were in the gender group of females. In a study conducted in Rehman College of nursing Peshawa, Pakistan among 100 staff nurses regarding the knowledge of ventilator associated pneumonia consist of majority (70%) of females and (30%) males.

Findings related to distribution of staff nurses according to educational qualification

In the present study the majority (45%) of subjects were having educational qualification of GNM . In a study conducted in Saveetha College of nursing, SIMATS, Chennai, Tamil Nadu among 50 staff nurses regarding ventilator associated pneumonia having educational qualification of BSc Nursing (52%).

Findings related to distribution of staff nurses according to working area

In the present study majority of (53.3%) of the subjects were working in wards. A study conducted by Dr.Thenmozhi.P and Priyanka.J at SIMATS, Chennai, Tamil Nadu among 50 staff nurses regarding the knowledge of ventilator associated pneumonia. Majority of staff nurses (26%) working in surgical intensive care unit (SICU).

Findings related to distribution of staff nurses according to year of experiences

In the present study (65%) of subjects were having >3 years of experience. In a study conducted in Selangor regarding knowledge of ventilator associated pneumonia among 120 staff nurses were majority (34.7%) of subjects having >3years of experience.

Findings related to distribution of staff nurses according to previous knowledge

In the present study majority (56.6%) of subjects were having previous knowledge from life experience. In a study conducted by Faizal Younuz at Kirkuk city hospitals among 30 intensive care staff nurses regarding the knowledge of ventilator associated pneumonia. The majority (83.3%) of subjects were having previous knowledge from life experiences.

Findings related to level of knowledge regarding ventilator associated pneumonia among staff nurses

Pre-test level of knowledge regarding ventilator associated pneumonia among 60 staff nurses, 1.6% of staff nurses having poor knowledge, 20% of staff nurses having moderate level of knowledge, 60% of staff nurses having good knowledge and 18.4% staff nurses having excellent knowledge.

Findings related to effectiveness of structured educational program on knowledge regarding ventilator associated pneumonia

The obtained “t” value for nursing staffs knowledge on ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staffs exposed to the structured educational programme had significant increase in post-test knowledge.

Findings related to the association between level of knowledge of staff nureses regarding ventilator associated pneumonia and their selected demographic variables

Present study result showed that there was no significant association between the level of knowledge regarding ventilator associated pneumonia among staff nurses and their selected demographic variables.

SUMMARY

Staff nurses exposed to structured educational programme had significant increase in post- test knowledge. There is no significant association between pre-test level of knowledge with selected demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

CONCLUSION

Ventilator associated pneumonia is a lung infection that develops in a person who is on a ventilator. Based on findings of present study the obtained “t” value for knowledge of ventilator associated pneumonia is 16.61 significant at 0.05 level. It is inferred that the nursing staff exposed to the structured educational programme had significant increase in post-test level of knowledge. By increasing the knowledge of staff nurses about Ventilator associated Pneumonia, the rate of infections in ICUs can be minimized.

REFERENCES

1. Sharma S.K. Nursing Research and statistics. 3rd edition. Elsevier publications. Page 12.
2. Grief S.N, Loza J. Guidelines for the evaluation and treatment for pneumonia; 2018. Available from: <https://www.ncbi.nlm.nih.gov>.
3. Boltey E, Yakusheba O, Kelly D. Nursing strategies to prevent ventilator associated pneumonia. Published online 2017 Jan 12, Available from: <https://www.ncbi.nlm.nih.gov>.
4. Chithra R.A, Raju J. Effect of structured teaching programme on prevention of ventilator associated pneumonia among critical care nurses. Jan 2017.
5. Gillespi.R. Prevention and management of ventilator associated pneumonia, The care bundle approach prevention. Indd.2009;25 (2):44-51. Available from: <https://go.gale.com>.
6. Hemavati.V, Bhaskaran G. A study to assess the effectiveness of structured teaching programme on knowledge regarding prevention of ventilator associated pneumonia among the staff nurses working in intensive care unit in selected hospital; 2016. Available from: <https://journalijcar.org>.
7. Korhan A.E et al. Critical care nurses, knowledge levels of intensive care nurses on prevention of ventilator associated pneumonia; 2014. Available from: <https://pubmed.ncbi.nlm.nih.gov>.
8. Limper H .A ,Goldman . Over view of pneumonia. Published online 2012. Available from: <https://www.ncbi.nlm.nih.gov>
9. Nengle J. A randomized trial of diagnostic techniques for ventilator associated pneumonia . med.2006;355.2619-2630. DOL:10.1056 /nejm 0ao52904. Available from: <https://pubmed.ncbi.nlm.nih.gov>
10. Roy D. conceptual frame work on health belief model; published online march 20, 2017 . Available from : <https://www.slideshare.net>
11. Chastre J , fagon Y.J. ventilator associated pneumonia . American journal of respiratory and critical care medicine volume(165) .issue 7; January 17,2002. Available from : <https://obi.org>
12. Bingham M , Ashley , Jeffery, et.al implementation a unit-level intervention to reduce the probability of ventilator associated pneumonia ; volume (59) January 2010: Available from : <https://pubmed.ncbi.nlm.nih.gov>
13. Ranjan N, Chaudhary U , Ranjan K P . Ventilator associated pneumonia in tertiary care unit. Analysis of incidence ,risk factors and mortality , Indian journal of critical care of medicine . published online April 18 ,2014 . Available from: <https://pubmed.ncbi.nlm.nih.gov>
14. Shahnaz A ,Bhardwaj u , Tamang K. A . comparative study to assess the competency among ICU Nurses in using ventilator associated pneumonia bundle to prevent ventilator associated pneumonia in selected government and private hospitals .October 2018: Available from : <https://www.researchgate.net>

15. Deshmukh B , Kadam s , Rajesh M T. clinical study of ventilator associated pneumonia in tertiary care hospital Kolhapur, Maharashtra ,India 2017. Available from: <https://dx.doi.org>
16. Mishra R, Rani N . Ventilator associated pneumonia .published online . January
2020. Available from : <https://www.researchgate.net>
17. Chithra R.A , Raju J. Effect of structured teaching programme on prevention of ventilator associated pneumonia among critical care nurses , January 2017. Available from : <https://www.researchgate.net>
18. Busi S. Effectiveness of structured teaching programme on level of knowledge and practices regarding prevention of ventilator associated pneumonia among critical care nurses , February 2016 , International Journal of advance in Nursing 4 (2) : 2454-2652 DOL :10.5958/2454-2652.2016.Available from : <https://ijanm.com>
19. Yuvaraja A ,SivaKumar M. Net.al. Effect of structured teaching programme on nurses knowledge to prevent ventilator associated pneumonia 2014.Available from: <https://pubmed.ncbi.nlm.nih.gov>
20. Price C P. Research method of psychology first Canadian edition 2013.Available from: <https://books.google.com>
21. Susan K G, Burns N. Understanding nursing research 4th edition Elsevier
Publication2007 page: 125-129. Available from : <https://www.academia.edu>
22. Igwenagui C. Fundamentals of research methodology and data collection Published online April 2016.Available from : <https://avys.omu.edu.tr>
23. Kahir S, Muhammad S. Methodes of data collection, July 2016. Available from: <https://www.researchgate.net>
24. Gounder S. Research methodology and research method March 2012 .Available from: <https://gtu.ge>
25. Mukesh S.N. Population ,Sample and sampling technique April 2020. Available from: <https://svnc.co.in>
26. Dr. Pandery P ,DR. Mishra. Research methodology, tools and research techniques March 2015 .Available from: <https://euacademic.org>
27. Ebrahim A.N. Research tools : Scientific writing tools for writing literature review .Published online February 2016.Available from : <https://www.academia.edu>

METHODOLOGY

Research approach

Quantitative research approach is adopted for this study.

Research design

. The research design used for this study was one group pre-test post-test research
Dependent variables:-

. Dependent variable of this study was the knowledge level on ventilator associated pneumonia.

Independent variable:-

. In this study the independent variable is structured education.

Demographic variable:-

Age, gender, educational qualification, present working area, year of experience and previous knowledge.

SETTING OF THE STUDY

The study conducted among the staff nurses in PKDIMS.

POPULATION

Population is a complete set of persons or objects that possess some characteristic of interest to the researcher. The populations for this study consist of all the staff nurses in PKDIMS.

SAMPLE AND SAMPLING TECHNIQUE

The sample of the present study consist of 60 staff nurses in PKDIMS who works in MICU, SICU,CCU, Wards and casualty. The sampling technique adopted for the present study was purposive sampling technique.

INCLUSION CRITERIA:-

Staff nurses among PKDIMS who are willing to participate in the study
Staff nurses in PKDIMS who have 5 year experience.

EXCLUSION CRITERIA:-

Staff nurses are not willing to participate in the study.

Staff nurses who have more than 5 year experience.

TOOLS AND TECHNIQUE**Development of tool:-**

The tool used in the study was structured questionnaire.

Section A: - structured questionnaire to assess the demographic variables.

- ❖ It includes: age, gender, educational qualification, present working area, year of experience, previous knowledge.

Section B: - Structured questionnaire to assess the knowledge regarding the prevention of ventilator associated pneumonia. It was a questionnaire prepared by investigator after an extensive review of literature on prevention of ventilator associated pneumonia.

- ❖ It consists of 24 questions regarding pneumonia and ventilator associated pneumonia.
- ❖ Each question has 4 options.
- ❖ The score for each correct response was 1 and incorrect response was 0.
- ❖ The maximum possible score was 24.

The obtained knowledge score was graded as follows:

LEVEL OF KNOWLEDGE	RANGE
Excellent knowledge	19-24
Good knowledge	13-18
Moderate knowledge	7-12
Poor knowledge	1-6

PILOT STUDY

The pilot study was done among staff nurses in Lakshmi hospital Palakkad. Investigator selected 6 subjects based on inclusion criteria using purposive sampling technique.

DATA COLLECTION PROCESS

Formal permission was obtained from the administrative authorities of PKDIMS. The sample of 60 staff nurses who fulfill the inclusion criteria were selected using purposive sampling technique. Pretest level of knowledge and practice were assessed using structured questionnaire. After that provided

education regarding the prevention of ventilator associated pneumonia .Post test was conducted using the same tool after 12 days, through using structured questionnaire.

PLAN FOR DATA ANALYSIS

The data obtained was analyzed on the basis of the objectives of the study using descriptive and inferential statistics.

DESCRIPTIVE STATISTICS:-

Frequency and percentage distribution were Used to study the selected demographic variables.

INFERENCEAL STATISTICS:-

Paired 't' test and chi square test was used to find out the association of knowledge with selected demographic variables. The findings of the study were presented in the form of tables and figures.

ANALYSIS AND INTERPRETATION

This study is designed to assess the effect of structured education regarding ventilator associated pneumonia among staff nurses in PKDAS INSTITUTE OF MEDICAL SCIENCE. Data was collected from 60 samples which full filled the inclusion criteria. The data was tabulated analyzed and interpreted using descriptive and inferential statistics.

Objectives

4. To assess the level knowledge regarding prevention of ventilator associated pneumonia among staff nurses.
5. To find the effectiveness of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses
6. To find the association between pre tests level of knowledge with selected socio demographic variables.

Presentation of data

Section 1: Distribution of staff nurses based on selected socio demographic variables.

Section 2: assessment of level of knowledge regarding ventilator associated pneumonia among staff nurse.

Section 3: Effect of structured education on ventilator associated pneumonia among staff nurses.

Section 4: Association between level of knowledge and selected demographic variables.

SECTION 1:**Distribution of staff nurses according to socio demographic variables.**

The section one deals with frequency and percentage distribution of staff nurses. According to state of socio demographic variables such as age in year, sex, educational qualification, present working area, year of experience and previous knowledge

Table 1: Frequency and percentage distribution of staff nurses**according to age in year.****(n=60)**

Variable(age in year)	Frequency	Percentage
21-25	19	31.6
26-30	25	41.6
31-35	10	16.6
36-40	6	10

Table 1: reveals that majority (41.6%)of the subjects were in the age group of 26-30 years . 31.6% of the subjects were in 21-25 years,16.65 of the subjects were in 31-35 years and 10% of the subjects were in the age group of 36-40 years

Table 2: Frequency and percentage distribution of staff nurses according to**sex.****(n=60)**

Variables (sex)	Frequency	Percentage
Male	0	0
Female	60	100
Transgender	0	0

Table 2 reveals that majority (100%) of the subjects were in the gender group of female.

Table 3: Frequency and percentage distribution of staff nurses according to educational qualification. (n=60)

Variables(education qualification)	Frequency	Percentage
GNM	27	45
Post BSc	7	11.7
BSc	26	43.3
MSC	0	0

Table 3: reveals that the majority (45%) of the subjects was having education qualification as GNM, 43.33% of subjects were having education qualification as BSC and 11.7% of subjects were having education qualification as post BSC.

Table 4: Frequency and percentage distribution of staff nurses according to present working (n=60)

Variable(present Frequency percentage working area)	Frequency	percentage
MICU	16	26.7
SICU	10	16.7
CCU	2	3.3
Ward	32	53.3
Casualty	0	0

Table 4: reveals that majority (53.3%) of the subjects were from working in wards ,26.7% of the subjects were from working in MICU.16.7% of subjects were from working inSICU,3.3% of subjects were from working in CCU and 0% of subjects were from working in casualty.

Table 5: Frequency and percentage distribution of staff nurses according to year of experience. (n=60)

Variable(year of experience)	Frequency	Percentage
<3	21	35
>3	39	65

Table 5: reveals that majority 65% of subjects were having >3 years of experience and 35% of subjects were having <3 years of experience.

Table 6: Frequency and percentage distribution staff nurses according to previous knowledge (n=60)

Variable(previous knowledge)	Frequency	Percentage
Books`	20	33.4
Newspapers	6	10
Journals	0	0
Life experience	34	56.6

Table VI reveals that majority 56.6 % of subjects were having previous knowledge from life experience, 33.4% of subjects were having previous knowledge from books and 10% of subjects were having previous knowledge from newspapers.

SECTION II :**Table 7: Assessment of level of knowledge regarding ventilator associated pneumonia among staff nurses**

Variable	Frequency	Percentage
Poor knowledge	1	1.6%
Moderate knowledge	12	20%
Good knowledge	36	60%
Excellent knowledge	11	18.4%

Pre test level of knowledge regarding ventilator associated pneumonia among 60 staff nurses, 1.6% of staff nurses having poor knowledge, 20% of staff nurses having moderate level of knowledge, 60% of staff nurse having good knowledge and 18.4% staff nurses having excellent knowledge.

SECTION III:**Effect of structured education on ventilator associated Pneumonia among staff nurses**

This section deals with the analysis of effectiveness of structured educational programme on knowledge on ventilator associated pneumonia among staff nurses by calculating mean, standard deviation and t value of knowledge.

Table 8: Mean standard deviation and t value of knowledge scores of staff nurses

Variables	Mean	Standard deviation	t value	p value
Pre test	14.7	3.28	16.61	0.0001**
Post test	22.8	1.07		

**significant at 0.0001 level

The above table 8: shows that the obtained “t” value for nursing staffs knowledge of ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staffs exposed to the structured educational programme had significant increase in post test knowledge.

SECTION IV:

Association between level of knowledge and selected Demographic variables

This section deals with association between level of knowledge and demographic variables such as age, sex, educational qualification, present working area , year of experience and previous knowledge.

Table 9: Association between levels of knowledge with age in years

Variables	Level of knowledge				Chi square	knowledge	knowledge
	Poor knowledge	Moderate knowledge	Good knowledge	Excellent knowledge			
21-25	0	3	14	2	0.21	Age	in years
26-30	1	5	13	6			
31-35	0	3	4	3			
36-40	0	1	5	0			

Table 9: shows that chi square test value of level of knowledge with age in years is 0.21. There is no association between levels of knowledge with age in years.

Association between levels of knowledge with sex

In this present study all the staff nurses are females.

Table 10: Association between levels of knowledge with educational qualification

Variables	Level of knowledge				Chi square
	Poor knowledge	Moderate knowledge	Good knowledge	Excellent knowledge	
Educational qualifications					
GNM	0	3	20	4	2.75
Post BSc	0	4	2	1	
BSc	1	5	14	6	

The table x shows that chi square test value of level of knowledge with educational qualification is 2.75. There is no association between level of knowledge with educational qualification.

Table 11: Association between levels of knowledge with present working area

Variables	Level of knowledge				Chi square
	Poor knowledge	Moderate knowledge	Good knowledge	Excellent knowledge	
Present working area					
MICU	0	2	12	2	3.1
SICU	0	3	4	3	
CCU	1	0	1	0	
WARD	0	7	19	6	

Table 11: shows that chi square test value of level of knowledge with present working area is 3.1. There is no association between levels of knowledge with present working area.

Table 12: Association between levels of knowledge with year of experience.

	Level of knowledge				Chi square	P value	Knowledge	Knowledge	Knowledge
	Poor	Moderate	Good	Excellent					
>3 Year of experience	1	7	21	10					
<3 Year of experience			0	5	15	1	2.1		

Table 12: shows that chi square test value of level of knowledge with year of experience is 2.71. There is no association between levels of knowledge with year of experience.

Table 13: Association between levels of knowledge with previous knowledge

	Level of knowledge				Chi square	P value	Knowledge	Knowledge	Knowledge
	Poor	Moderate	Good	Excellent					
Books	0	3	14	3					
Newspapers			0	3	1	2	1.43		
Life experiences			1	6	12	6			

Table 13: shows that chi square test value of level of knowledge with previous knowledge is 1.43. There is no a association between level knowledge with previous knowledge

HYPOTHESES TESTING

H₁: There will be a significant difference between pre-test and post-test score.

H₀: There is no significant difference between pre-test and post-test score.

H₂: There will be significant association between pre-test level of knowledge and selected demographic variables.

The “t” value for nursing staff knowledge regarding ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staff exposed to the structured educational programme had significant increase in post-test knowledge. Hence Hypothesis H₁ is accepted and H₀ is rejected.

Study shows that there will be no significant association between pre-test level of knowledge with selected demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

RESULTS

The findings of the study are presented under the following headings.

Section 1: Distribution of staff nurses based on a selected Socio demographic Variables

Regarding the age: It reveals that majority (41.6%) of the subjects were in the age group of 26-30 years. 31.6% of the subjects were in 21-25 years, 16.65 of the subjects were in a 31-35 years and 105 of the subjects were in the age group of 36-40 years respectively.

Regarding the sex : (100%) were female.

Regarding the educational qualification: It reveals that the majority (45%) of the subjects were having educational qualification as GNM, 43.33% of subjects were having educational qualification as BSc and 11.7% of subjects were having education qualification of Post Basic BSc.Nursing.

Regarding the present working area: According to this majority of the subjects (53.3%) were working in wards, 26.7% of the subjects were working in MICU, 16.7% of subjects were from working in SICU, 3.3% of subjects were from working in CCU.

Regarding year of experience: It reveals that majority (65%) of subjects were having > 3 year of experience and 35% of subjects were having <3years of experience.

Regarding previous knowledge : It shows that majority (56.6%) of subjects were having previous knowledge from life experience, 33.4% of subjects having previous knowledge from books and 10% of subjects having previous knowledge from newspapers.

Section 2: Assessment of level of knowledge regarding ventilator associated Pneumonia among staff nurses.

Pre -test level of knowledge regarding ventilator associated pneumonia among 60 staff nurses, 1.6% of staff nurses having poor knowledge, 20% of staff nurses having moderate level of knowledge, 60% of staff nurses having good knowledge and 18.4% staff nurses having excellent knowledge.

Section 3 : Effect of structured education regarding ventilator associated Pneumonia among staff nurses

The “t” value for nursing staff knowledge regarding ventilator associated pneumonia value in 16.61 significant at 0.05 level . It is inferred that the nursing staff exposed to the structured educational programme had significant increase in post- test knowledge.

Section 4: Association between level of knowledge and selected socio demographic variables

There were no association between level of knowledge and selected socio- demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

Discussion

The purpose of the study was to assess the effectiveness of structured educational programme regarding prevention of ventilator associated pneumonia among staff nurses. The sample was selected by purposive sampling technique. The data was collected from 60 staff nurses by structured knowledge questionnaire to assess the knowledge of ventilator associated pneumonia.

The result shows that the obtained “t” value for knowledge of ventilator associated pneumonia value is 16.61 significant at 0.05 level. It is inferred that nursing staff exposed to the structured education programme had significant increase in post test knowledge.

Findings related to distribution of staff nurses according to age

In the present study majority (41.6%) of samples were in the age group of 26 to 30 years. A study conducted in Kirkuk city hospitals among 30 intensive care staff nurses regarding the knowledge of ventilator associated pneumonia, the majority (46.7%) of the age group were 24-29 years old.

Findings related to distribution of staff nurses according to gender

In the present study majority of (100%) the subjects were in the gender group of females. In a study conducted in Rehman College of nursing Peshawa, Pakistan among 100 staff nurses regarding the knowledge of ventilator associated pneumonia consist of majority (70%) of females and (30%) males.

Findings related to distribution of staff nurses according to educational qualification

In the present study the majority (45%) of subjects were having educational qualification of GNM . In a study conducted in Saveetha College of nursing, SIMATS, Chennai, Tamil Nadu among 50 staff nurses regarding ventilator associated pneumonia having educational qualification of BSc Nursing (52%).

Findings related to distribution of staff nurses according to working area

In the present study majority of (53.3%) of the subjects were working in wards. A study conducted by Dr.Thenmozhi.P and Priyanka.J at SIMATS, Chennai, Tamil Nadu among 50 staff nurses regarding the knowledge of ventilator associated pneumonia. Majority of staff nurses (26%) working in surgical intensive care unit (SICU).

Findings related to distribution of staff nurses according to year of experiences

In the present study (65%) of subjects were having >3 years of experience. In a study conducted in Selangor regarding knowledge of ventilator associated pneumonia among 120 staff nurses were majority (34.7%) of subjects having >3years of experience.

Findings related to distribution of staff nurses according to previous knowledge

In the present study majority (56.6%) of subjects were having previous knowledge from life experience. In a study conducted by Faizal Younuz at Kirkuk city hospitals among 30 intensive care staff nurses regarding the knowledge of ventilator associated pneumonia. The majority (83.3%) of subjects were having previous knowledge from life experiences.

Findings related to level of knowledge regarding ventilator associated pneumonia among staff nurses

Pre-test level of knowledge regarding ventilator associated pneumonia among 60 staff nurses, 1.6% of staff nurses having poor knowledge, 20% of staff nurses having moderate level of knowledge, 60% of staff nurses having good knowledge and 18.4% staff nurses having excellent knowledge.

Findings related to effectiveness of structured educational program on knowledge regarding ventilator associated pneumonia

The obtained “t” value for nursing staffs knowledge on ventilator associated pneumonia value in 16.61 significant at 0.05 level. It is inferred that the nursing staffs exposed to the structured educational programme had significant increase in post-test knowledge.

Findings related to the association between level of knowledge of staff nurses regarding ventilator associated pneumonia and their selected demographic variables

Present study result showed that there was no significant association between the level of knowledge regarding ventilator associated pneumonia among staff nurses and their selected demographic variables.

SUMMARY

Staff nurses exposed to structured educational programme had significant increase in post- test knowledge. There is no significant association between pre-test level of knowledge with selected demographic variables such as age, sex, educational qualification, present working area, year of experience and previous knowledge.

CONCLUSION

Ventilator associated pneumonia is a lung infection that develops in a person who is on a ventilator. Based on findings of present study the obtained “t” value for knowledge of ventilator associated pneumonia is 16.61 significant at 0.05 level. It is inferred that the nursing staff exposed to the structured educational programme had significant increase in post-test level of knowledge. By increasing the knowledge of staff nurses about Ventilator associated Pneumonia, the rate of infections in ICUs can be minimized.

REFERENCES

9. Sharma S.K. Nursing Research and statistics.3rdedition. Elsevier publications. Page 12.
10. Grief S.N, Loza J. Guidelines for the evaluation and treatment for pneumonia; 2018. Available from: <https://www.ncbi.nlm.nih.gov>.
11. Boltey E, Yakusheba O, Kelly D. Nursing strategies to prevent ventilator associated pneumonia. Published online 2017 Jan 12, Available from: <https://www.ncbi.nlm.nih.gov>.
12. Chithra R.A, Raju J. Effect of structured teaching programme on prevention of ventilator associated pneumonia among critical care nurses. Jan 2017.
13. Gillespi.R. Prevention and management of ventilator associated pneumonia, The care bundle approach prevention. Indd.2009;25 (2):44-51. Available from: <https://go.gale.com>.
14. Hemavati.V, Bhaskaran G. A study to assess the effectiveness of structured teaching programme on knowledge regarding prevention of ventilator associated pneumonia among the staff nurses working in intensive care unit in selected hospital;2016. Available from: <https://journalijcar.org>.
15. Korhan A.E et al. Critical care nurses, knowledge levels of intensive care nurses on prevention of ventilator associated pneumonia:2014 . Available from: <https://pubmed.ncbi.nlm.nih.gov>.
16. Limper H .A ,Goldman . Over view of pneumonia. Published online 2012. Available from: <https://www.ncbi.nlm.nih.gov>
13. Nengle J. A randomized trial of diagnostic techniques for ventilator associated pneumonia . med.2006;355.2619-2630.DOL:10.1056 /nejm 0ao52904. Available from: <https://pubmed.ncbi.nlm.nih.gov>
14. Roy D. conceptual frame work on health belief model; published online march 20, 2017 . Available from : <https://www.slideshare.net>
15. Chastre J , fagon Y.J. ventilator associated pneumonia . American journal of respiratory and critical care medicine volume(165) .issue 7; January 17,2002. Available from : <https://obi.org>
16. Bingham M , Ashley , Jeffery,et.al implementation a unit-level intervention to reduce the probability of ventilator associated pneumonia ;volume (59) January 2010: Available from : <https://pubmed.ncbi.nlm.nih.gov>
28. Ranjan N, Chaudhary U , Ranjan K P . Ventilator associated pneumonia in tertiary care unit. Analysis of incidence ,risk factors and mortality ,Indian journal oof critical care of medicine . published online April 18 ,2014 . Available from: <https://pubmed.ncbi.nlm.nih.gov>
29. Shahnaz A ,Bhardwaj u , Tamang K. A . comparative study to assess the competency among ICU Nurses in using ventilator associated pneumonia bundle to prevent ventilator associated pneumonia in

selected government and private hospitals .October 2018: Available from :

<https://www.researchgate.net>

30. Deshmukh B , Kadam s , Rajesh M T. clinical study of ventilator associated pneumonia in tertiary care hospital Kolhapur, Maharashtra ,India 2017. Available from: <https://dx.doi.org>
31. Mishra R, Rani N . Ventilator associated pneumonia .published online . January 2020. Available from : <https://www.researchgate.net>
32. Chithra R.A , Raju J. Effect of structured teaching programme on prevention of ventilator associated pneumonia among critical care nurses , January 2017. Available from : <https://www.researchgate.net>
33. Busi S. Effectiveness of structured teaching programme on level of knowledge and practices regarding prevention of ventilator associated pneumonia among critical care nurses , February 2016 , International Journal of advance in Nursing 4 (2) : 2454-2652 DOL :10.5958/2454-2652.2016.Available from : <https://ijanm.com>
34. Yuvaraja A ,SivaKumar M. Net.al. Effect of structured teaching programme on nurses knowledge to prevent ventilator associated pneumonia 2014.Available from: <https://pubmed.ncbi.nlm.nih.gov>
35. Price C P. Research method of psychology first Canadian edition 2013.Available from: <https://books.google.com>
36. Susan K G, Burns N. Understanding nursing research 4th edition Elsevier Publication2007 page: 125-129. Available from : <https://www.academia.edu>
37. Igwenagui C. Fundamentals of research methodology and data collection Published online April 2016.Available from : <https://avys.omu.edu.tr>
38. Kahir S, Muhammad S. Methodes of data collection, July 2016. Available from: <https://www.researchgate.net>
39. Gounder S. Research methodology and research method March 2012 .Available from: <https://gtu.ge>
40. Mukesh S.N. Population ,Sample and sampling technique April 2020. Available from: <https://svnc.co.in>
41. Dr. Pandery P ,DR. Mishra. Research methodology, tools and research techniques March 2015 .Available from: <https://euacademic.org>
42. Ebrahim A.N. Research tools : Scientific writing tools for writing literature review .Published online February 2016.Available from : <https://www.academia.edu>
43. Teijlingen E, Ffundley V. The importance of pilot studies available from : <https://pubmed.ncbi.nlm.nih.gov>
44. N Burns, S k Grove Understanding nursing research 2nd edition Philadelphia W B Saunders company page:40

45. I Holloway. Basic concepts for qualitative research 1997. Available from: <https://www.scirp.org>
46. Milne V H, Kington J et.al. Raising research awareness among midwives and nurses 2000. Available from: <https://pubmed.ncbi.nlm.nih.gov>