



A Study to Assess the Effectiveness of Structure Teaching Program on Knowledge Regarding Prevention of Ventilator Associated Pneumonia Among Staff Nurses in Selected Hospital at Jaipur

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Introduction

Background of Study

Ventilator-associated pneumonia (VAP) is common in the intensive care unit (ICU), affecting 8 to 20% of ICU patients and up to 27% of mechanically ventilated patients.[1]

Several risk factors have been reported to be associated with VAP, including the duration of mechanical ventilation, and the presence of chronic pulmonary disease, sepsis, acute respiratory distress syndrome (ARDS), neurological disease, trauma, prior use of antibiotics, and red cell transfusions.[2]

Mortality rates in patients with VAP range from 20 to 50% and may reach more than 70% when the infection is caused by multi-resistant and invasive pathogens.[3]

The incidence of VAP-attributable mortality is difficult to quantify due to the possible confounding effect of associated conditions, but VAP is thought to increase the mortality of the underlying disease by about 30%. VAP is also associated with considerable morbidity, including prolonged ICU length of stay, prolonged mechanical ventilation, and increased costs of hospitalization.[4]

Delayed diagnosis and subsequent delay in initiating appropriate therapy may be associated with worse outcomes in patients with VAP on the other hand, an incorrect diagnosis may lead to unnecessary treatment and subsequent complications related to therapy. Early, accurate diagnosis is, therefore, fundamental in the management of patients with VAP.[5,6]

Several criteria have been proposed for diagnosing VAP in clinical settings, including clinical manifestations, imaging techniques, methods to obtain and interpret bronchoalveolar specimens, and biomarkers of host response. Due to the lack of an acceptable gold standard, the accuracy of these methods in diagnosing VAP is controversial.

The aim of this qualitative review was, therefore, to compare various criteria for diagnosing VAP in the ICU with a special emphasis on the value of clinical diagnosis, microbiological culture techniques, and biomarkers of host response.

In today's health care environment, there is heightened awareness of the importance of infection control and prevention. This concern is partly in response to the high number of nosocomial infection acquired each year, posing serious problem in terms of morbidity, mortality and overall costs for health care system.[7]

The quality of care received by a patient in any hospitals depends on the care given by the nurses of that particular hospital. The quality can be improved if the nurses follow evidence based nursing practices. These practices should be reviewed at set intervals for improvements. Tracking and measuring nursing sensitivity quality indicator will help in setting up the best practices.

Nursing is the core activity of any hospitals which play the most important role in bringing Quality Care. Commonly tracked indicators are pressure sores, patient falls, intravenous line infection, hand hygiene practices, blood stream infections, urinary tract infections, medication error, ventilator associated pneumonia etc.

Infections are big concerns of any intensive care units. When patients are on mechanical ventilator, nurses play the vital role in preventing ventilator associated pneumonia by following Universal Precautions. It is the nurses responsibility to see that each and every one follows these precautions who come in contact with their patients. Thus, their role plays an active part in cost effective health care system.

Need of the Study

Patient in any hospital are exposed to healthcare – acquired infections and it become critical when they are in intensive care unit to their various diseased conditions. Hence the health care personal should take enough steps to prevent or break the chain of infection.

There is a global consensus regarding the gap, between the importance of infection control training in basic health science programs and in work – place.[8]

The experts in the line of infection control are very few. Hence creating awareness about different ways and means to prevent and control infection among the nurses become inevitable in order to deliver quality care. To improve the access to training, a research was initiated to develop an online infection control and prevention program.[9]

In intensive care unit when patient are on ventilators they are at a very high risk for developing ventilator associated pneumonia. Ventilator associated pneumonia which results in increased mortality, increased length of stay and increased cost.[10]

Education intervention on ventilator associated pneumonia among intensive care unite nurses will bring awareness and motivation in preventing and controlling ventilator associated pneumonia in intensive care

units. This is also increase in the confidence level in nurses, making them powerful advocates for their patients and their right which, in turn, result in faster recovery. The researcher wants to increase the motivation and confidence level in nurses which will give a quality output.

A descriptive cross-sectional survey was carried out in 37 ICUs of 23 hospitals in Sana'a city, Yemen. A self-administered multiple-choice questionnaire listing 15 evidence-based preventive strategies was distributed to all nurses. Nurses had the least knowledge (<24%) regarding frequency of humidifier and suction systems changes, use of kinetic beds, and oral route for tracheal intubation. The nurses' knowledge mean total score was 47.3% (7.1 on 15 items). Holding a bachelor degree in nursing and acquisition of a short course in respiratory therapy were shown to be associated with better knowledge scores. Knowledge of evidence-based strategies for preventing VAP is low among most nurses working in Yemen ICUs.[11]

A study was conducted to evaluate the knowledge of nurses working in general intensive care units concerning evidence-based measures for the prevention of ventilator-associated pneumonia. Cross-sectional design was used. It was carried out on nurses working in the general intensive care units of anesthesiology. The median value of total points scored by nurses on the questionnaire was 4.00 ± 2.00 . The difference between the nurses' education levels, duration of work experience and articipation in in-service training programmes on ventilator-associated pneumonia prevention and the median value of their total scores on the questionnaire was found to be statistically significant ($p < 0.05$). The conclusion of the study was that critical care nurses' knowledge about ventilator-associated pneumonia prevention was found poor.[12]

A study was conducted on Ventilator-associated pneumonia (VAP) continues to be a common and potentially fatal complication of ventilator care. The aim of this study is to assess the critical care nurses' knowledge and compliance with ventilator associated pneumonia bundle. A sample of convenience of 45 critical care nurses was recruited from different critical care units at Cairo university hospital for this study. Questionnaire and direct observation of nurses who provided nursing care to mechanically ventilated patients was carried out utilizing VAP bundle compliance checklist. The results of 20- items questionnaire revealed unsatisfactory knowledge scores (mean= 7.46 ± 2.37) and most of the nurses were not compliant with ventilator associated pneumonia bundle practices (average mean = 8.62 ± 7.9 out of 29). The findings of the study recommended the need for developing and implementing a protocol for VAP prevention in ICUs.[13]

A study was conducted to examine critical care nurses' knowledge about the use of the ventilator bundle to prevent VAP. After the education sessions, the nurses performed better on 8 of the 10 items tested (P from

.03 to $<.001$). The areas of most significant improvement were elevation of the head of the bed ($P < .001$), charting of the elevation of the head of the bed ($P = .009$), oral care ($P = .009$), checking of the nasogastric tube for residual volume ($P = .008$), washing of hands before contact with patients ($P < .001$), and limiting the wearing of rings ($P < .001$) and nail polish ($P = .04$). Even after the education sessions, the nurses' compliance with hand-washing recommendations before contact with patients was low, though statistically some improvement was apparent.[14]

During my clinical experience, I had found that many of prolonged bed ridden patient develop ventilator associated pneumonia and the main cause is poor sterile technique while doing improper suctioning, improper positioning, improper ryles tube feeding etc. For that I felt to enhance the knowledge regarding prevention of ventilator associated pneumonia among staff nurses.

Statement of the Problem

“A Study to Assess the Effectiveness of structured teaching program on knowledge regarding prevention of Ventilator Associated Pneumonia Among Staff Nurses in Selected Hospital At Jaipur”.

OBJECTIVE OF THE STUDY

1. To assess the knowledge level of intensive care unit nurses on prevention of ventilator associated pneumonia.
2. To assess the effectiveness of the structured teaching program.
3. To determine the association between the pre test and post test scores with selected demographic variables.

OPERATIONAL DEFINITION

Knowledge

In this study it refers to the correct level of response from the participation regarding ventilator association pneumonia elicited through structured questionnaire.

Effectiveness

In this study it refers to significant gain in knowledge and practice as determined by pre test and post test knowledge scores on prevention of ventilator associated pneumonia.

Structured teaching program

In this study structured teaching program refers to the information providing to intensives care unit nurses regarding ventilator associated pneumonia through a systematically developed instruction and teaching aid.

Staff nurse

A person who had received the appropriate education and training in the discipline of nursing, a person specially trained to provide services essential to or helpful in the promotion, maintenance and restoration of health and well being, a person skilled in nursing.

Ventilator associated pneumonia

In patients receiving invasive mechanical ventilation, a new and persistent infiltrate seen on chest x-ray associated with fever, elevated or depressed white blood cell counts, and sputum that is either purulent or full of disease-causing bacteria.

ASSUMPTIONS

The study assumes that:-

1. The staff nurses may have some knowledge regarding prevention of ventilator associated pneumonia.
 2. Demographic variables may influence the knowledge regarding prevention of VAP.
 3. STP is useful strategy to increase knowledge of staff nurses regarding VAP.
 4. Staff nurses knowledge regarding prevention of ventilator associated pneumonia may decrease the future incidence of VAP.
-

Delimitation

The study is limited to Staff nurses working in ICU

Conceptual Frame Work

A conceptual framework is the processor of a theory. It provides broad perspectives for nursing practice, research and education. Conceptual frame work plays several interrelated roles in the progress of science. In nursing, conceptual model identify concepts and describe their relationships to the phenomena of central concern to the discipline. It helps to conceptualize and plan care. Their overall purpose is to make scientific findings meaningful and generalizable.[27]

Polit and Hungler state that “A Conceptual framework is an interrelated concept on abstractions that are assembled together in some rational scheme by their virtue of their relevance to a common theme. It is a device that helps to simulate research and the extension of knowledge by providing both direction and impetus” Present study aimed at evaluating the effectiveness of structure teaching programme on knowledge regarding prevention of ventilator associated pneumonia among staff nurses working in selected hospitals at Jaipur.[27]

The conceptual framework of the present study was developed by the investigator based on Imogene King’s Goal Attainment Model. This model focus on interpersonal relationship between the client and staff nurse and this interaction is influenced by the perception leads to both client and nurses. This interaction led to mutual goal setting that are to be achieved by the subjects, in the present study the interaction took place between the investigator and staff nurses.[27]

Perception

Perception is a process in which data obtained through senses and from memory are organized, interpreted and transformed, which are related to past experience, concept of self and educational background. In the present study investigator and staff nurses perceived the need to gain knowledge regarding ventilator associated pneumonia. Both the investigator and the staff nurse set the goal to gain knowledge regarding prevention of ventilator associated pneumonia and to improve the practices.

Action

During action phase the first the investigator prepared the structured knowledge questionnaire to assess the knowledge of staff nurses and based on that structure teaching programme was prepared with the help of power point presentation and flash cards. The staff nurses were motivated to participate and gain knowledge towards the care patients with prevention of ventilator associated pneumonia.

Interaction

During the interaction phase the investigator is administrating structure teaching programme and assess the responses of staff nurses and taking active participation of staff nurses by asking doubts.

Transaction

During this phase the investigator assessed that staff nurses gain knowledge or did not gain knowledge by using of post-test.

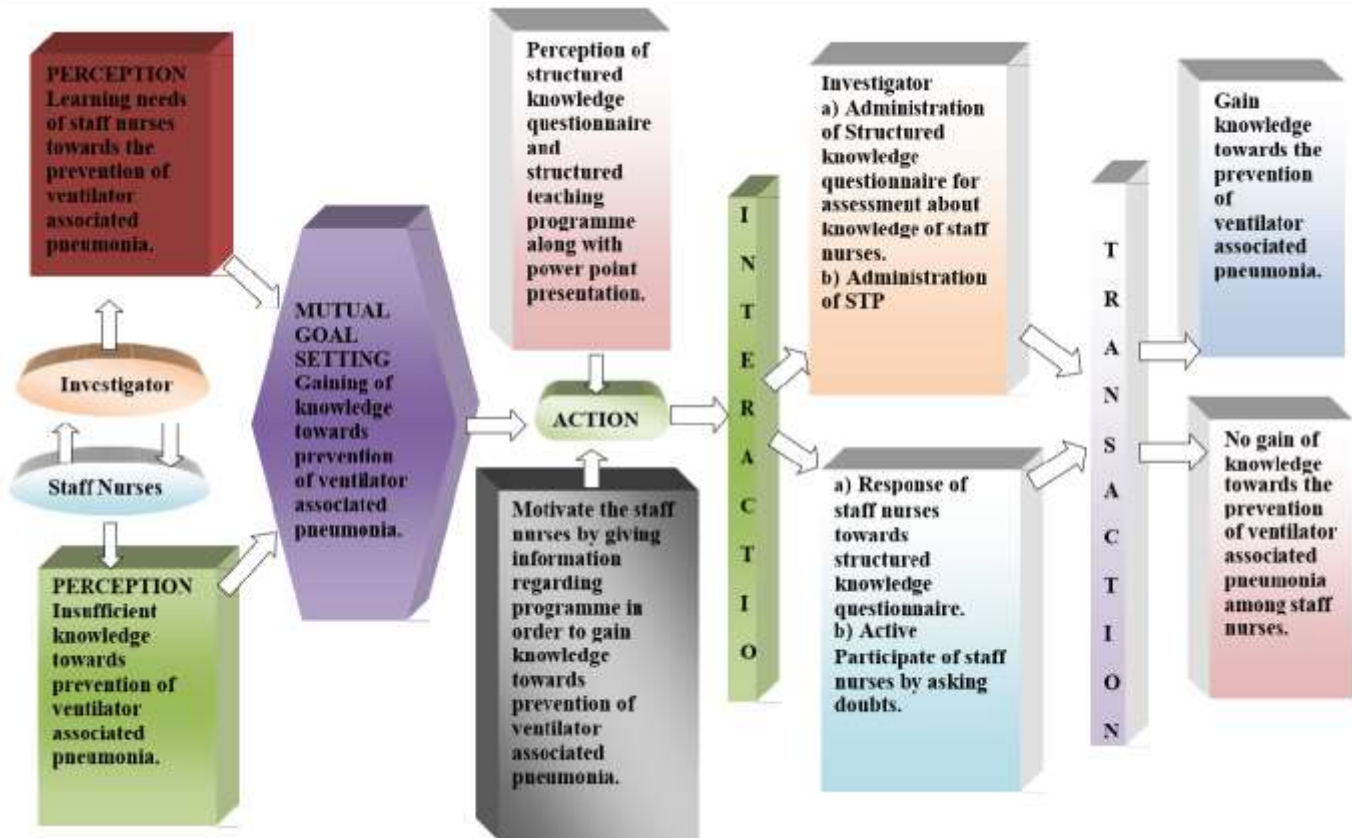


Figure: I Modified Conceptual framework on effectiveness of STP in staff nurses towards the prevention of VAP based on Imogene King's goal attainment modal

Ethical Consideration

- Written permission was obtained from the concerned hospital authorities, BMCHRC and Apex Hospital, Jaipur.
- Informed written consent was obtained from the individual samples, which were enrolled for the study and assured them that all the information will be kept confidential and will be used only for the present study.

Summary

This chapter dealt with the contents of introduction about knowledge on Ventilator Associated Pneumonia among staff nurses, back ground of the study, need for the study, statement of the problem, objectives of the study, operational definition, assumptions, hypothesis, conceptual framework, delimitations and ethical consideration.

Research Methodology

“Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge.”[26]

Research Methodology is defined as a way to solve the research problem systematically. It may be understood as a science of studying how research is done scientifically. The scope of research methodology is wider than that of research methods. Research methodology is not only about the research methods but also consider the logic behind the methods use in the context of the research study. It explains why a particular method or technique is used or not used in the study. Thus, research results are capable of being evaluated either by the researcher or by others.[26]

This chapter deals with the methodology adopted for the proposed study and the different steps under taken after gathering and organizing data for investigation. It includes description of research approach, research design, setting of the study, population, sample and sampling technique, development and description of the data collection tool, pilot study, development of Structure Teaching Program, procedure of data collection and plan for data analysis.[26]

Research Approach

The selection of approach is the basic procedure for the condition of research enquiry. A research approach tell us what data to collect and how to analysis it. It also suggests possible conclusion to be drawn from the data.

Evaluative approach was used to find out the effectiveness of Structure Teaching Program on knowledge regarding Prevention of Ventilator Associated Pneumonia.

Research Design

The term Research Design refers to the plan of scientific investigation. The research design helps the researchers in the selection of subjects, identification of variables, their manipulation and control, observations to be made and type of statistical analysis to be used to interpret the data.[26]

According to Polit&Hungler, “The overall plan for addressing a research question, including specifications for enhancing the study’s integrity. The design provides the framework for the study. It determines how the study will be organised, when the data will be collected and where intervention, if any is to be implemented.”[26]

In present study a single group pre-test and post-test with Quasi-experimental research design was used, in which pre-test is followed by administration of Structure Teaching Program and then conducting post- test for the same group after 7 days.

Quasi- experimental design was used in the study to assess the knowledge of staff nurses regarding Prevention of Ventilator Associated Pneumonia and to test the effectiveness of Structure Teaching Program for staff nurses.

GROUP	PRE-TEST	INTERVENTION	POST-TEST
	Assessment of knowledge before administering Planned Teaching Program	Administration of Planned Teaching Program	Assessment of knowledge after administering Planned Teaching Program
	01	X	02

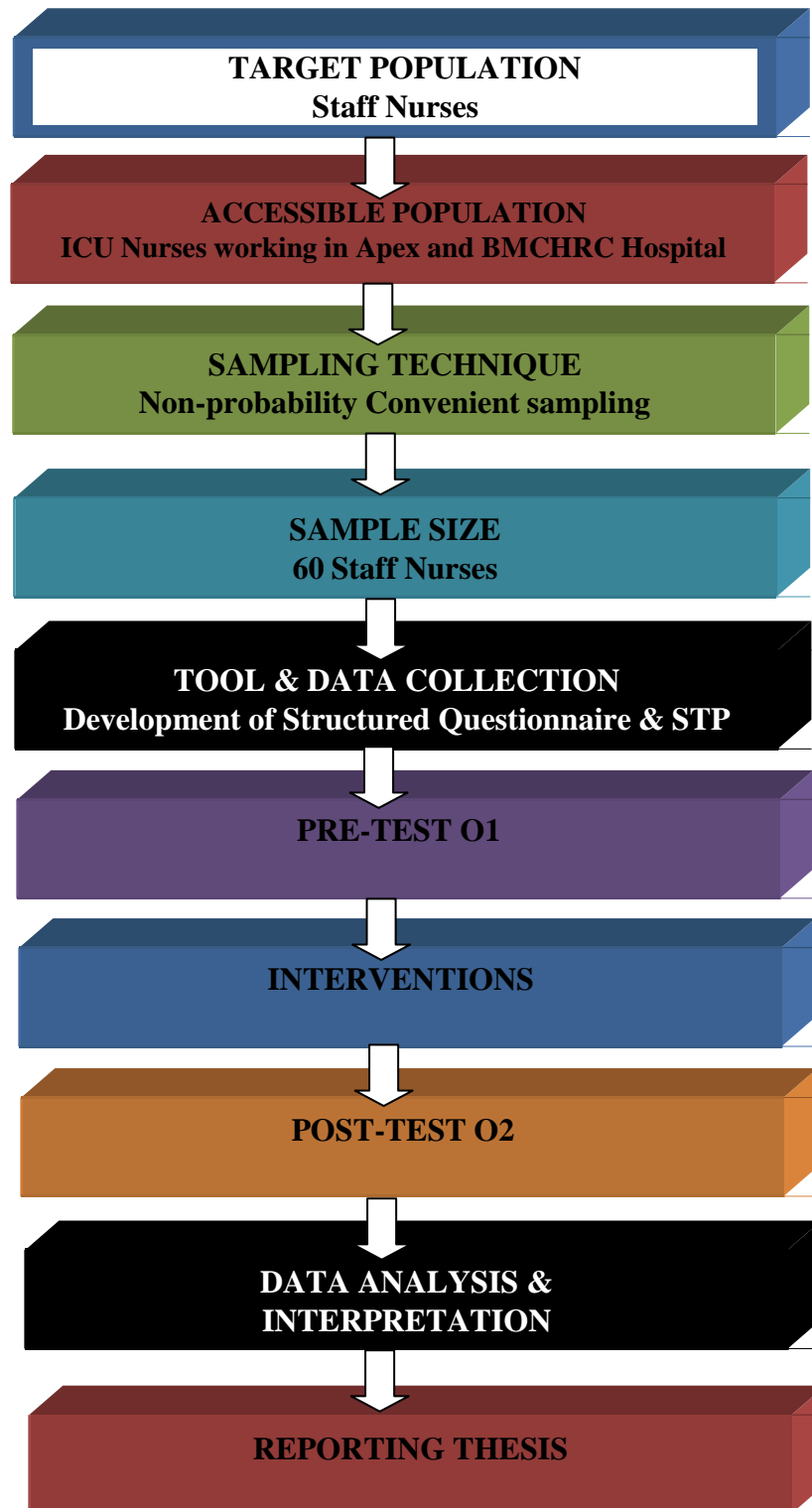


Figure: II Schematic Representation of Research Design

Variables Included in the Study

A variable is a measurable or potentially measurable of an object or event that may fluctuate in quality or quantity from one individual object or event to another individual object or event of the same general class.

Three types of variables were identified in this study:

1. Dependent Variable:

If one variable depends upon or is a consequence of other variables, it is termed as dependent variable.

In the present study it refers to the knowledge level of staff nurses regarding Preventions of Ventilator Associated Pneumonia.

2. Independent Variable:

The variable that is believed to cause or influence the dependent variable is termed as independent variable.

In this study it refers to the structure teaching program on preventions of Ventilator Associated Pneumonia.

3. Demographic Variables:

The demographic variable is an uncontrolled variable that greatly influences the study. The study also consists of demographic variables;

- Gender
- Age
- Educational Qualification
- Professional experience
- Source of knowledge

Research Hypothesis

The level of significance chosen for the entire hypothesis was 0.05

H1: There will be significant difference between pre-test and post-test knowledge score related to prevention of ventilator associated pneumonia.

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

Setting of the Study

Setting of the study refers to the area where the study is conducted.

The study was conducted in the Apex Hospital and BMCHRC Hospital, Jaipur.

Population

Population refers to the entire aggregation of cases that meet a designated set of criteria.

In the present study, the population is staff nurses working in ICU of the Apex Hospital and BMCHRC Hospital, Jaipur.

Sample and Sampling Technique

Sample:

Sample is a portion of the population that has been selected to represent the population of interest.

The samples for the present study were 60 staff nurses working in ICUs of the Apex Hospital and BMCHRC Hospital, Jaipur.

Sampling Technique:

It refers to the process of selecting a portion of the population to represent the entire population.

In this study, a Convenient, non-probability sampling technique is used to select the sample. Convenient sampling technique is a strategy in which researcher's knowledge of the population and its elements are

used to select sample which are typical to the population.

Convenient sampling technique, a type of non-probability sampling approach was found to be appropriate for this study.

Criteria for the Sample Selection

Inclusion Criteria: - Study include staff nurses -

- Those who are willing to participate in the study.
- Those who are present at the time of data collections.
- Those who are working in the ICU of Apex and BMCHRC hospital.

Exclusion Criteria:

- Those who are not available at the time of study.
- Those who are not willing to participate in the study.
- Those who are not working in ICU.

Description and Interpretation of Tool

Selection and Development of Tool

A tool selected in the research should be as far as possible the vehicle that would best obtain data for drawing conclusions, which were pertinent to the study.

The researcher prepared tool with the help of Literature Review and by expert's suggestion and sent for content validation. According to their suggestion and recommendation necessary correction were made. The modified tool was used for data collection. For assessing the reliability of the tool, it was administered to ten samples at Rungta Hospital, Jaipur.

Selection of the Tool

Structured questionnaire was selected for the study to collect the data from staff nurses to assess their knowledge regarding Preventions of Ventilator Associated Pneumonia.

Development of Tool

A structured questionnaire was prepared to assess the knowledge of staff nurses regarding Preventions of Ventilator Associated Pneumonia.

The following steps were carried out in preparing the tool:

- Review of Literature
- Development of the Blue print which consisted of 26 questions.
- Preparation of Structure teaching program.
- Preparation of structured questionnaire on the knowledge regarding preventions of VAP.
- Consultation with guide and subject experts.
- Establishment of validity and reliability.

Description of the Tool

The structured questionnaire is comprised of two parts;

PART-I: It consists of demographic characteristics of staff nurses seeking information like age, gender, professional qualifications, working experience, and source of information regarding Preventions of VAP.

PART-II: It consists of 26 structured questionnaires, divided into three sections. **SECTION-A:** This section consists of 7 items related to Introduction of VAP.

SECTION-B: This section consists of 8 items related to definition, risk factor, pathophysiology, clinical feature of VAP.

SECTION-C: This section consists of 11 items related to diagnostic evaluation and Preventions of VAP.

Scores of Knowledge Questionnaire

Among 26 questions, for each item there were four options, out of which one is correct. The maximum score for correct response to each item was one and incorrect was zero. Total score was converted into percentage and interpreted as <38% poor, 39-69% average, >70% good. Thus for 26 questions, there were 26 correct answers with 26 maximum obtainable scores. The collected information was statistically analysed by using frequency and percentage distribution.

Grade	Actual Score
Poor	1-10
Average	11-18
Good	19-26

Table No. I Shows Scoring of Knowledge Among Staff Nurses Redarding Preventions of Ventilator Associated Pneumonia.

Development of Planned Teaching Program Regarding Preventions of VAP

The Structure teaching program was developed based on the review of related research and on research literature.

The following steps are adopted to develop the Structure teaching program.

- Development of Structure teaching program.
- Establishment of content validity by subject expert.
- Final draft prepared.

Content Validity

Content validity refers to the determination of whether a measurement instrument actually measures what is purported to measure.

To ensure Content Validity of the tool, the structured questionnaire along with the Structure Teaching Program was send to 6 experts. They were requested to give their opinions on the appropriateness, relevance

of the items in the tool and the contents of the Structure Teaching Program. The four experts were from the field of Medical Surgical Nursing and two experts were from the field of Doctors.

Modifications were made according to the suggestions made by them.

Pretesting of Tool and Reliability

Reliability is the degree of consistency that the investigator consistently comes up with same measure when used to repeated occasions. In order to establish the tool was administered to 10 Staff nurses working in Rungta Hospital, Jaipur than the study sample. The split half method was used to test the reliability of the tool. The tool was first divided into two equivalent halves and correlational found for the half test using Karl Pearson's correlation coefficient formula. It shows that there is significant correlation between the scores. The reliability coefficient of the whole test is 0.75 Hence the tool was found to be reliable.

Stating the Objective

The objectives were identified and written in behavioural terms depending on the needs of the learner i.e., staff nurses.

Selection of the Content

The content of the Structure teaching program on Preventions VAP was selected through review of literature and its consultation with the experts. Then the content was divided into 8 areas.

Organization Of The Content

The content was organized in to the following chapters:

1. Introduction of Ventilator Associated Pneumonia
2. Definition of Ventilator Associated Pneumonia
3. Incidence of Ventilator Associated Pneumonia
4. Risk factors and Etiology of Ventilator Associated Pneumonia
5. Pathophysiology of Ventilator Associated Pneumonia

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6. Clinical Feature of Ventilator Associated Pneumonia
 7. Diagnostic Evaluation of Ventilator Associated Pneumonia
 8. Preventions of Ventilator Associated Pneumonia

Pilot Study

PILOT STUDY is the trial run of the methodology planned for the major project to make improvements in the research projects and to detect problems that must be solved before the major study is attempted.

After obtaining permission from the concerned authority the pilot study was conducted from 16-05-2016 to 25-05-2016 at Rungta Hospital, Jaipur, to find the effectiveness of the tool and study in terms of enhancement of knowledge regarding Prevention of Ventilator Associated Pneumonia. The samples chosen were similar to population under study. The investigator used non probability convenient sampling technique to select the samples from the total population. Ten samples (10% of the total samples) were selected for the study and these were excluded from the final study.

A pre-test was conducted by administering structured questionnaire, and then it was followed by administering Structure teaching program on Prevention of VAP. The pre-test was administered for each staff nurse. On the 8th day a post- test was administered by using the same tool which was used in the pre-test.

Procedure of Data Collection

(a) PERMISSION FROM THE CONCERNED AUTHORITY

Formal prior permission was obtained from the ethical committee of the Apex Hospital and BMCHRC Hospital, Jaipur to conduct the study.

(b) PERIOD OF DATA COLLECTION

The main study was conducted from 1 June, 2016 to 15 June, 2016 for a period of 2 weeks at the Apex Hospital and BMCHRC Hospital, Jaipur.

(c) PRE-TEST (O1)

The knowledge questionnaire was used to obtain data from staff nurses in the Apex Hospital and BMCHRC Hospital, Jaipur. Questionnaire was administered for each staff nurse.

(d) POST-TEST (O2)

The same pre-test questionnaire was used for post-test. It was conducted on 14 June, 2016.

Plan for Data Analysis

Data analysis helps the researcher to organize, summarize, evaluate, interpret and communicate the numerical facts.

The collected data was planned for data analysis in terms of objectives of study by using descriptive and inferential statistics.

The following plan will be developed for data analysis on the basis of the opinion of expert;

1. Organized the data in a master sheet.
2. Frequencies and percentages to be used for analysis of demographic data.
3. Calculation of mean, standard deviation of pre-test and post-test score.
4. Application of paired t-test to test whether there is significant difference in the mean knowledge score of pre-test and post-test values.
5. Chi-square to find out the association between the level of knowledge and their demographic variables.

Ethical Considerations

The research committee has approved the research problem statement and objectives stated for the present study. Explanation was given regarding purpose of study, confidentiality was ensured. Permission was obtained from Administrator and Nursing Superintendent to conduct the pilot at Rungta Hospital and main study at the Apex Hospital and BMCHRC Hospital, Jaipur.

Summary

This chapter deals with the methodology undertaken for the study. It includes research approach, research design, setting of the study, variables, population, sample & sampling technique, description and interpretation of tools, pilot study, data collection procedure and plan for data analysis.

Data Analysis and Interpretation

Data analysis is a process of organizing and synthesizing data in such way that research questions can be answered and tested.

Statistical procedure enables the researcher to organize, analyse, interpret, evaluate and communicate numerical information meaningfully. This chapter deals with the analysis and interpretation of the data collected to assess the knowledge of staff nurses regarding Prevention of ventilator associated pneumonia in Apex Hospital and BMCHRC Hospital.

The data were analyzed based on the following study objectives:

- To assess the level of knowledge of staff nurses regarding Prevention of ventilator associated pneumonia.
- To develop and validate the structure teaching program.
- To assess the effectiveness of structure teaching program.
- To find out association between knowledge score of undergraduates with their selected demographic variables.

Organization of Study Finding

The data are tabulated, analysed, organized and presented under the following headings.

SECTION-I: It deals with the analysis of the demographic data of the samples like age, gender, experience, area of working, professional qualification, and source of knowledge.

SECTION-II: It deals with the analysis of level of knowledge on prevention of ventilator associated pneumonia among staff nurses. Aspect wise distribution of scores during the pre- test and post-test, and Association between pre-test and post-test scores.

SECTION-III: Association between the level of knowledge of staff nurses on prevention of ventilator associated pneumonia and their selected variables (age, gender, basic nursing preparation, working experience in ICU, year of clinical experience etc.).

S. No.	Demographic Characters	Frequency (f)	Percentage (%)
1.1	Age (in years) Status		
	a) 21-30 Years	45	75.0
	b) 31-40 Years	13	21.67
	c) 41-50 Years	2	3.33
	d) Above 50 Years	0.0	0.0
1.2	Gender Status		
	a).Male	25	41.7
	b). Female	35	58.3
1.3	Type of Basic Nursing Preparation		
	a).GNM	35	58.33
	b) B.Sc. Nursing	15	25.0
	c) Post Basic B.Sc. Nursing	10	16.67
	d) M. Sc Nursing	0.0	0.0
1.4	Working Experience in ICU		
	a) 0-5 years	37	61.7
	b) 6-10 years	14	23.3
	c) 11-15 years	9	15.0
	d) Above 16 years	0.0	0.0
1.5	Total year of clinical Experience		
	a) 0-10 years	53	88.34
	b) 11-20 years	5	8.33
	c) 21-30 years	2	3.33
	d) Above 31 years	0.0	0.0
1.6	Have you ever got information of Ventilator Associated Pneumonia		
	a) Yes	20	33.33

	b) No	40	66.67
1.7	If yes, then source of information of Ventilator Associated Pneumonia		
	a) Books	10	50
	b) Conferences / CNE	4	20
	c) Diploma / Degree	0.0	0.0
	d) Internet	6	30
1.8	Have you ever given care to a patient with ventilator associated pneumonia		
	a) Yes	44	73.33
	b) No	16	26.67

N = 60

Table-II: Demographic Description of Semple by Frequency and Percentage

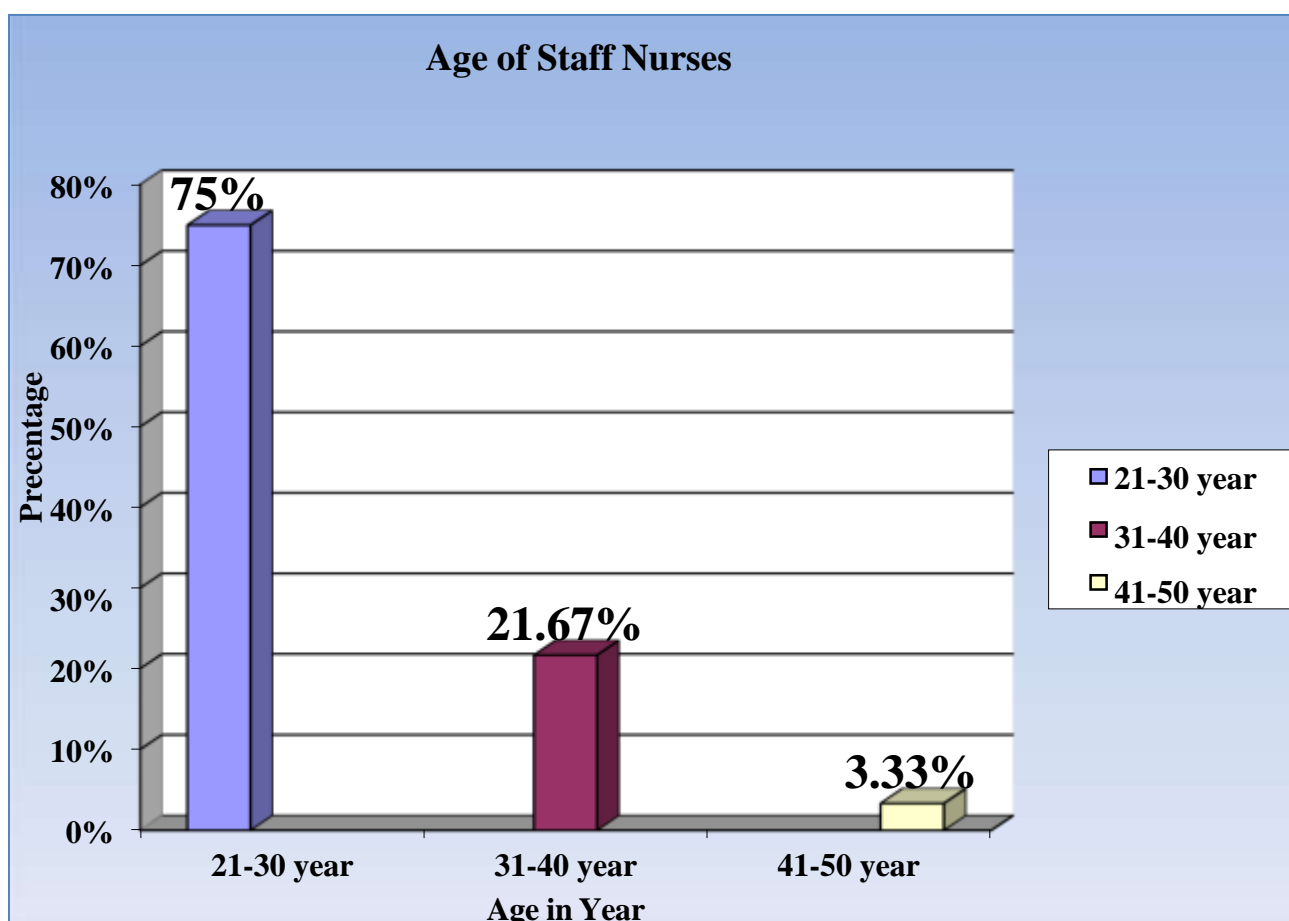


Figure- 3: Bar diagram shows the percentage distribution of staff nurses by Age

From the above table II & figure 3, the bar diagram Presents the age distributions of 75.00% respondents belong to age group of 21-30 years, 21.67% respondents belong to age group of 31-40 years, 3.33% respondents belong to age group of 41-50 years and no staff nurses was found in the age group of above 50 years. The maximum participant in the research study from the age group of 21-30 years.

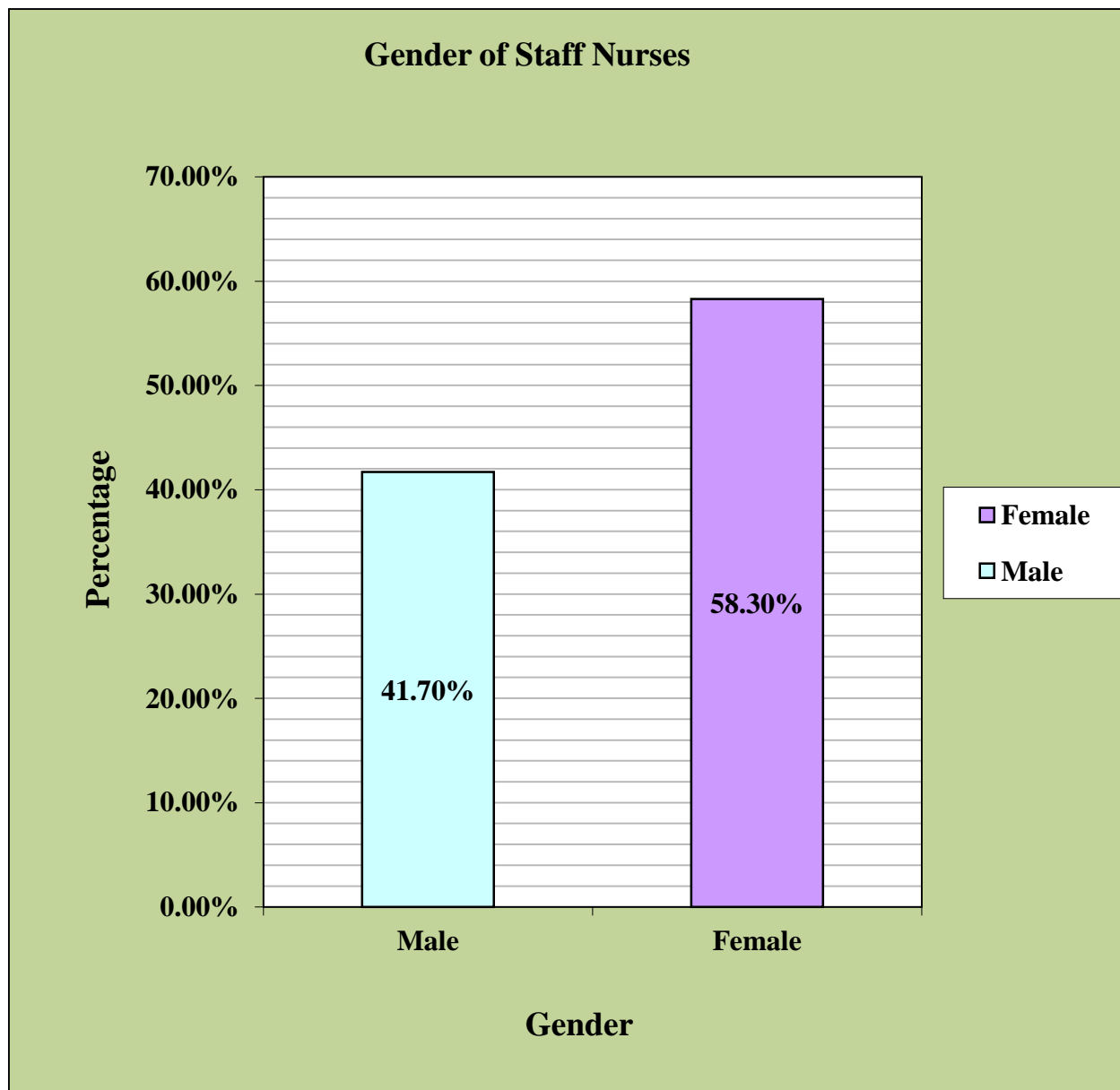


Figure-4: Column diagram shows the percentage distribution of staff nurses by Gender.

Table No. II and figure 4, reveals that in the study, 41.70% respondents were males and 58.30% respondents were females

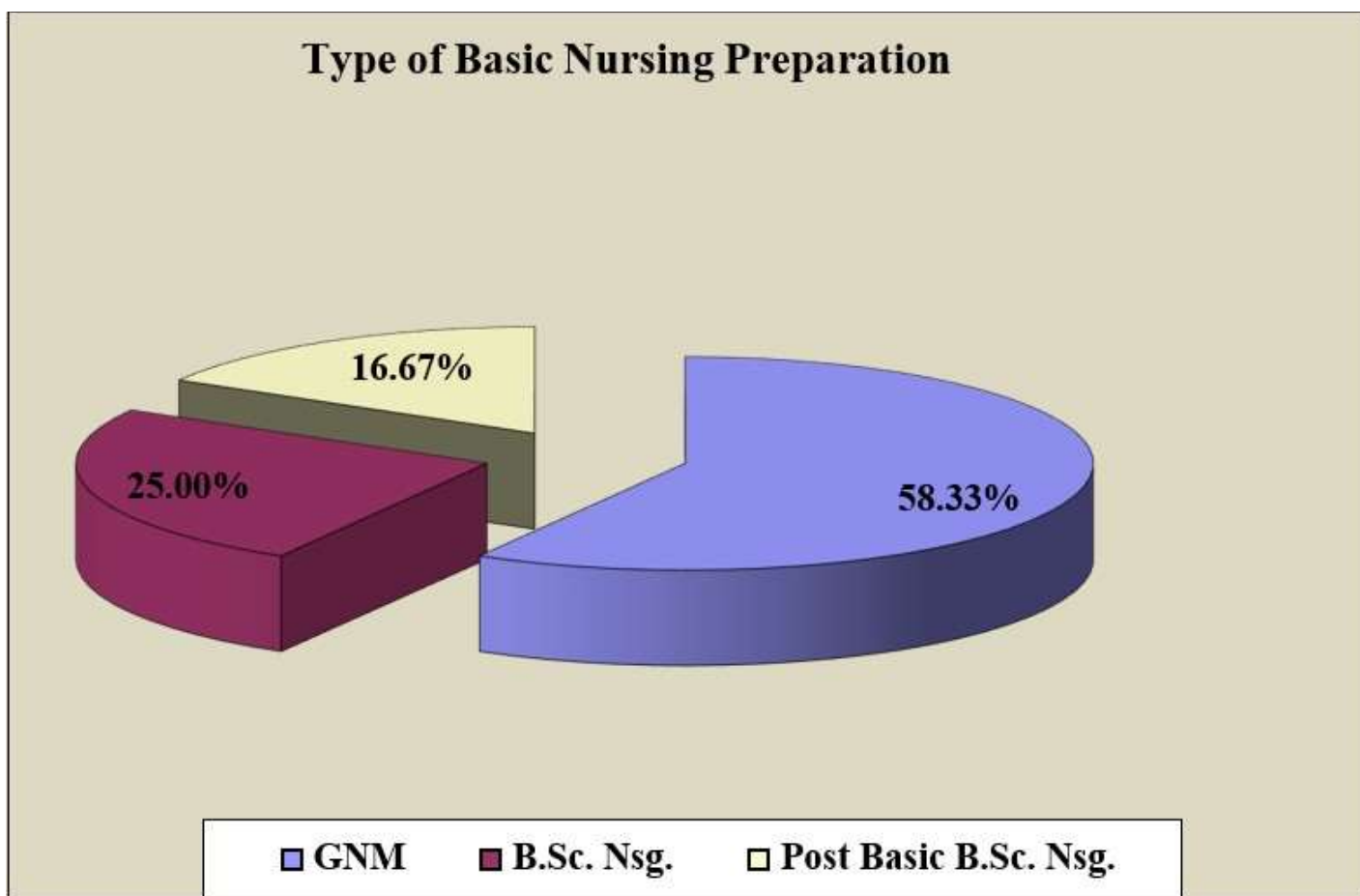


Figure-5: Pie diagram shows the percentage distribution of staff nurses by Type of Basic Nursing Preparation

Table no. II and Figure 5, shows that give the Basic Nursing Preparation Status and respondents who have participate in this study majority 58.33% respondents had completed GNM course, 25.00% completed B.Sc. Nursing, and 16.67% respondents had completed Post Basic B.Sc. Nursing.

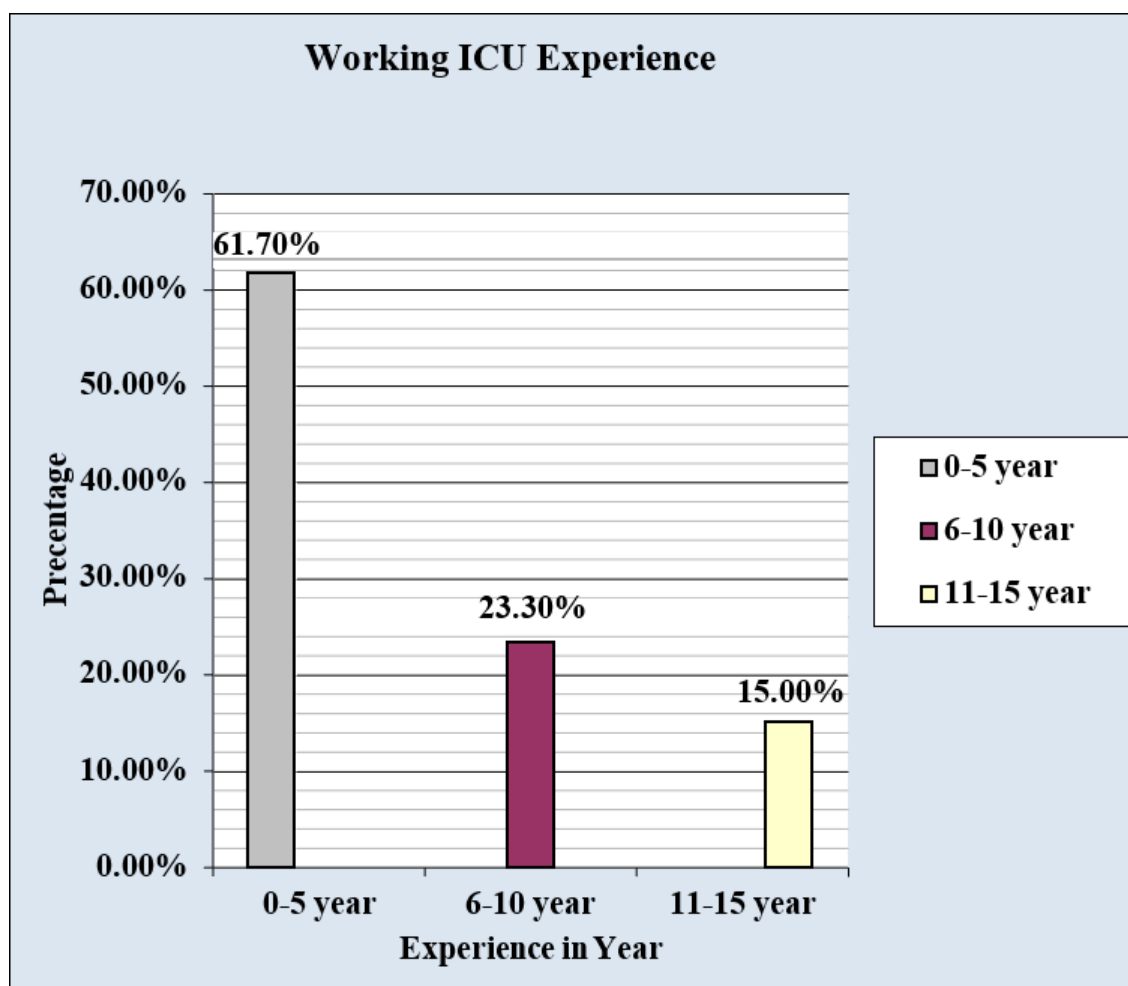


Figure-6: Column diagram shows percentage distribution of staff nurses by Years of Working ICU Experience.

Table no. II and Figure 6, shows that majority of 61.70% respondents had completed 0-5 years of experience in ICU, 23.30% of respondent had 6-10 years of experience in ICU, 15.00% of respondents had 11- 15 years of experience in ICU and n.a. of respondents had 16 years & above experience.

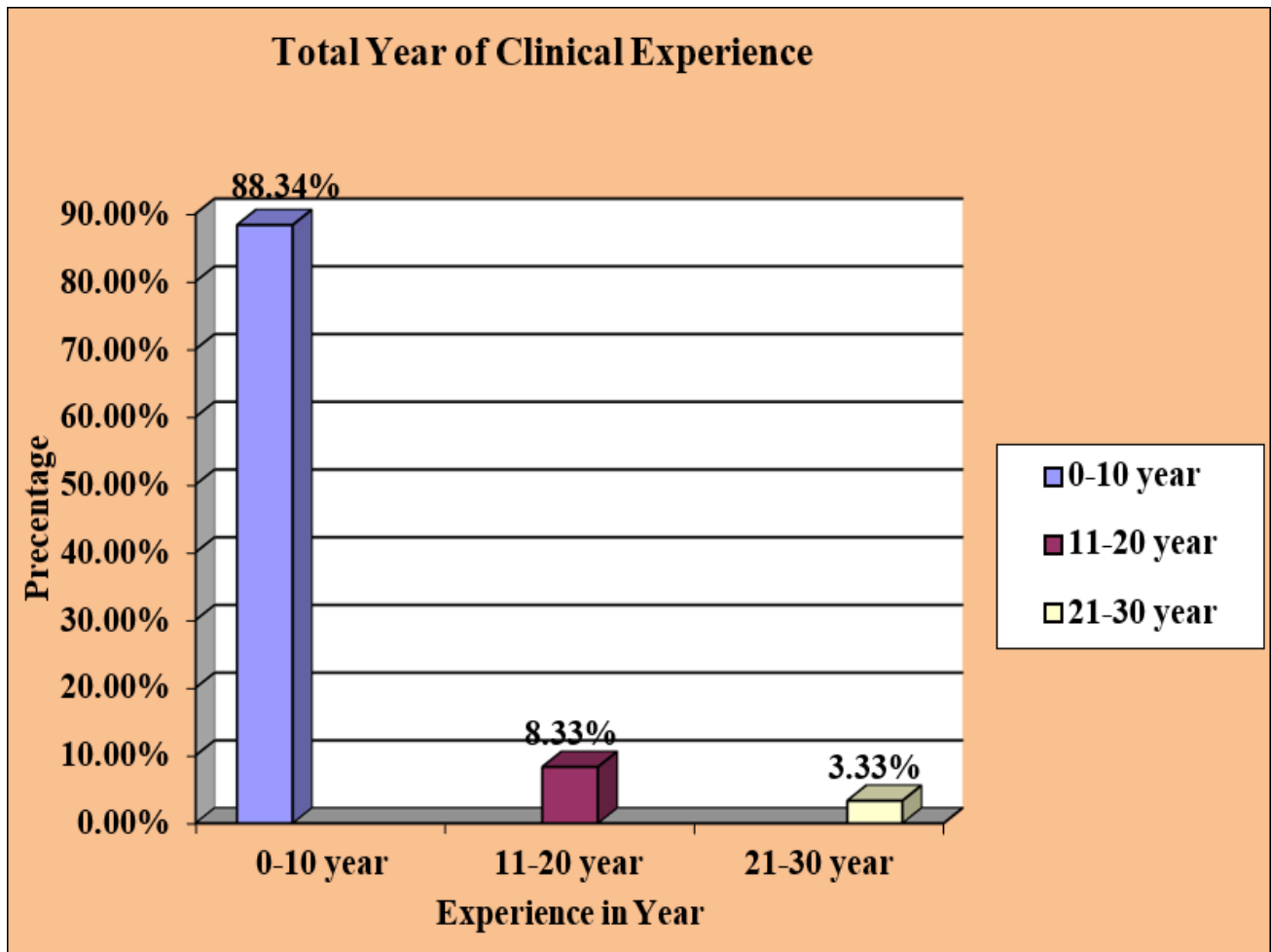


Figure-7: Bar diagram shows percentage distribution of staff nurses by Total Years of Clinical Experience Table no. II and Figure 7, shows that majority of 88.34% respondents had completed 0-10 years of experience, 8.33% of respondent had 10-20 years of experience, 3.33% of respondents had 21-30 years of experience and n.a. of respondents had 31 years & above experience.

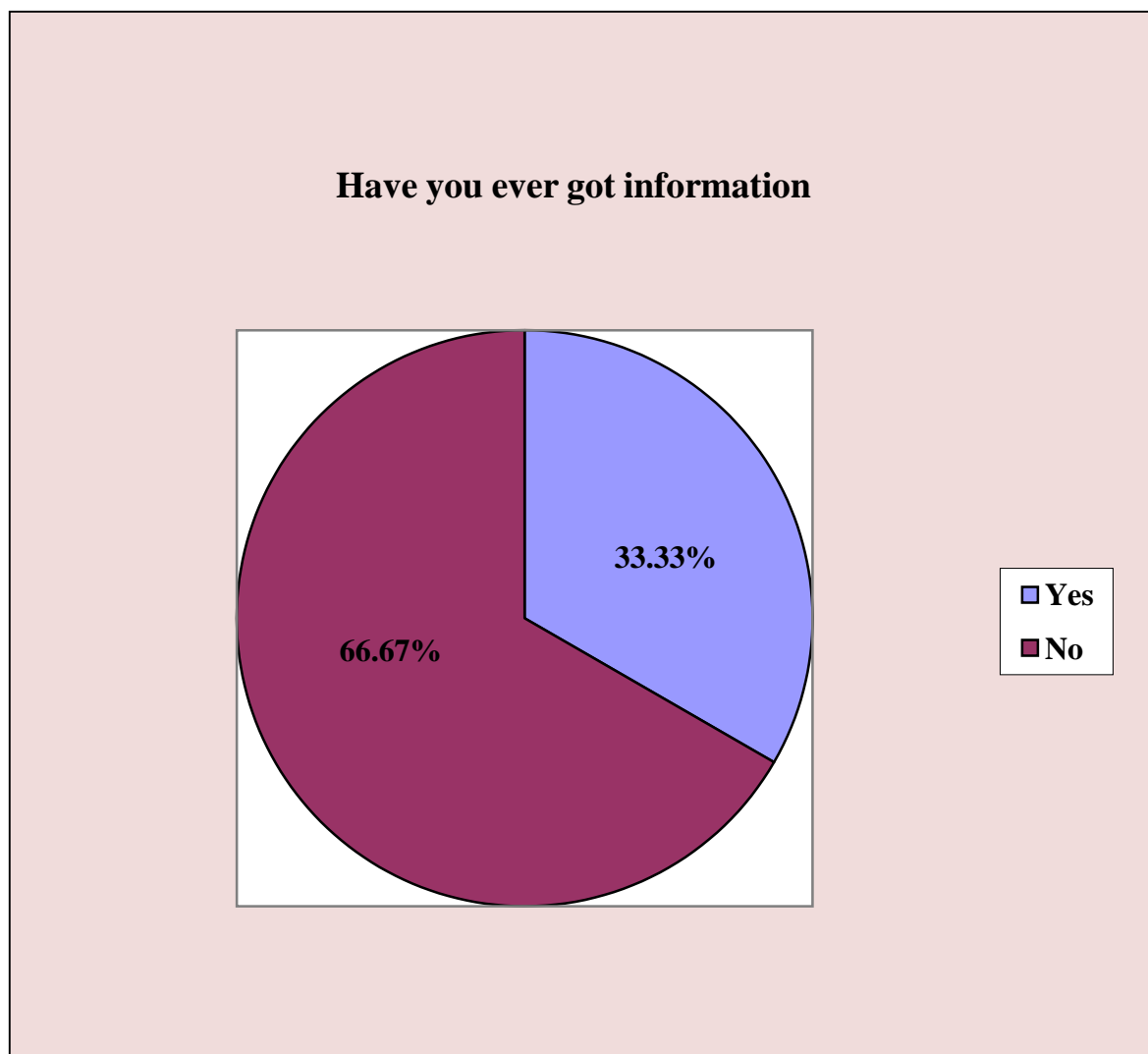


Figure-8: Pie diagram shows percentage distribution of staff nurses by Have you ever got information of Ventilator Associated Pneumonia

Table no. II and Figure 8, the pie diagram shows that majority of 66.67% respondent did not get any information regarding Ventilator Associated Pneumonia and 33.33% respondents have information regarding Ventilator Associated Pneumonia.

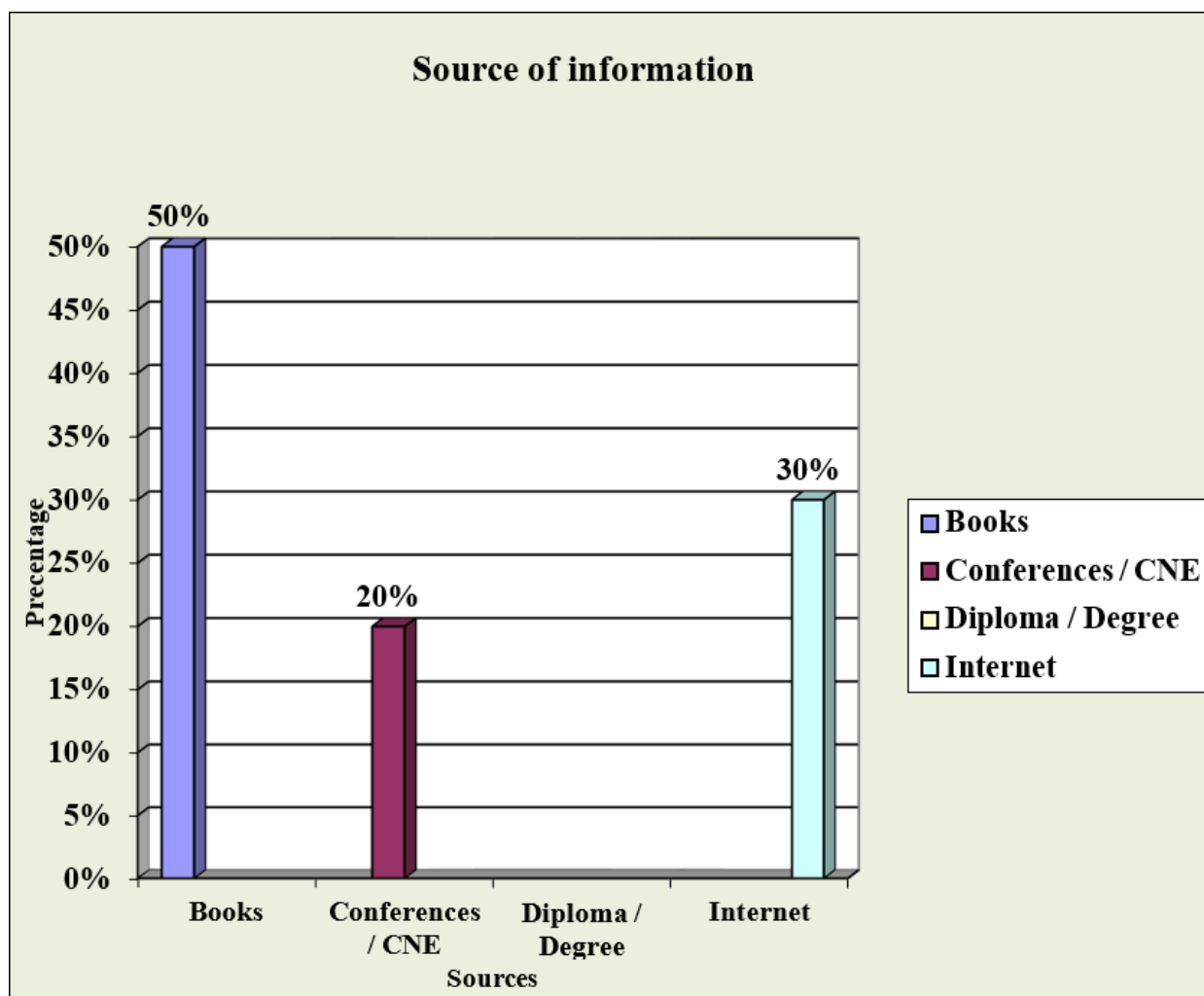


Figure-9: Bar diagram shows percentage distribution of staff nurses by source of information of Ventilator Associated Pneumonia

Table no. II and Figure 9, shows that 50% respondents got information of Ventilator Associated Pneumonia from the Books and 20% respondents got information of Ventilator Associated Pneumonia by Conference / CNE and 30% respondents got information of Ventilator Associated Pneumonia by Internet and No respondents did any diploma and degree about Ventilator Associated Pneumonia.

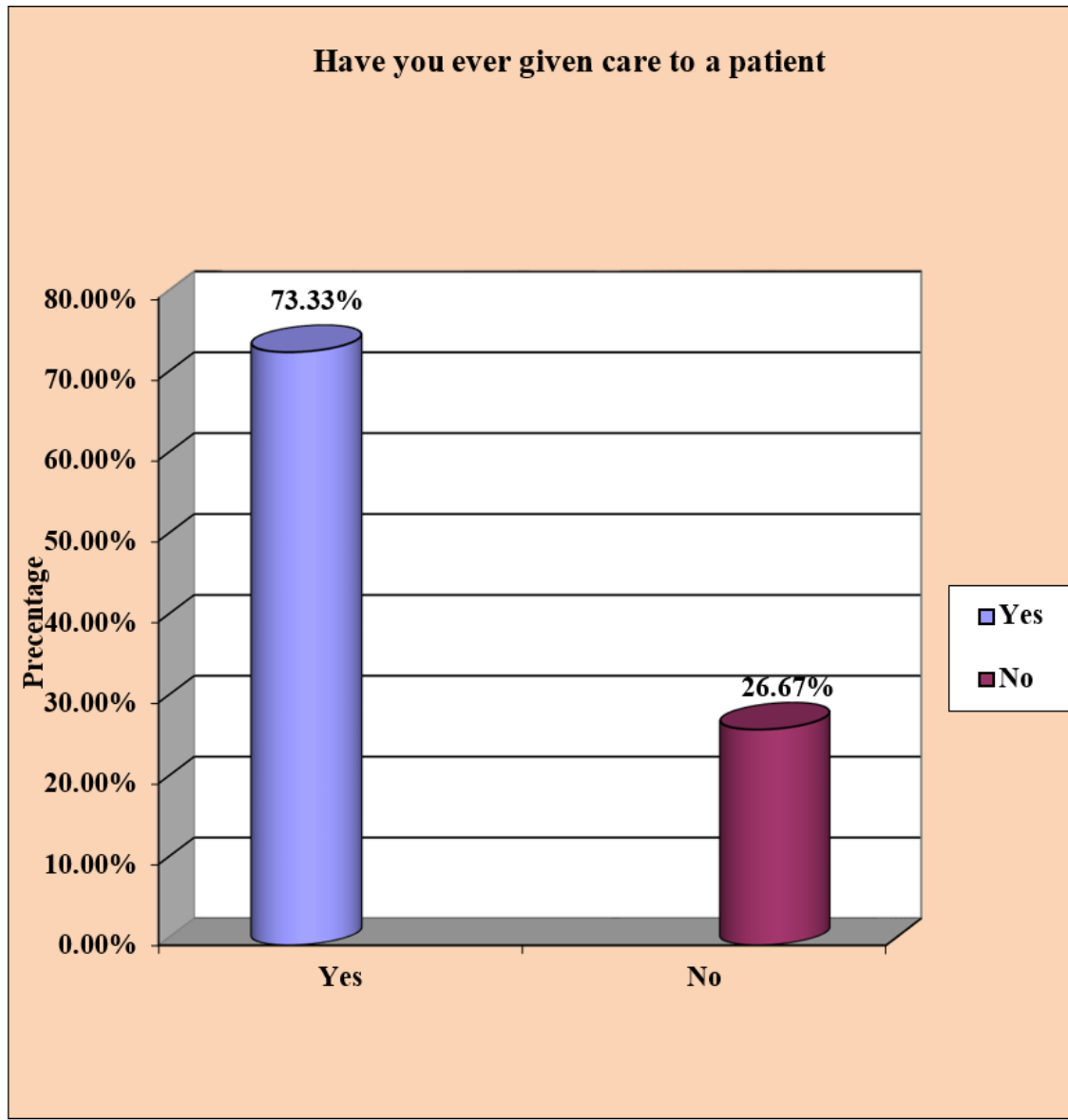


Figure-10: cylindrical diagram shows Percentage distribution of staff nurses by Have you ever given care to a patient with ventilator associated pneumonia.

Table no. II and Figure 10, shows the information regarding Have you ever given care to a patient with ventilator associated pneumonia 73.33% respondents were given care and 26.67% respondents were not given care to patient with ventilator associated pneumonia.

Section II

Level of knowledge (Percentage based)	Pre Level		Post Level	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Poor (0-38%)	14	23.33	0	0
Average (39-69%)	43	71.67	3	5
Good (70-100%)	3	5	57	95
Total	60	100.0	60	100.0

Table – III Distribution of Frequency And Percentage Overall Pre-Test & Post-Test Knowledge Regarding Prevention Of VAP Among Staff Nurses

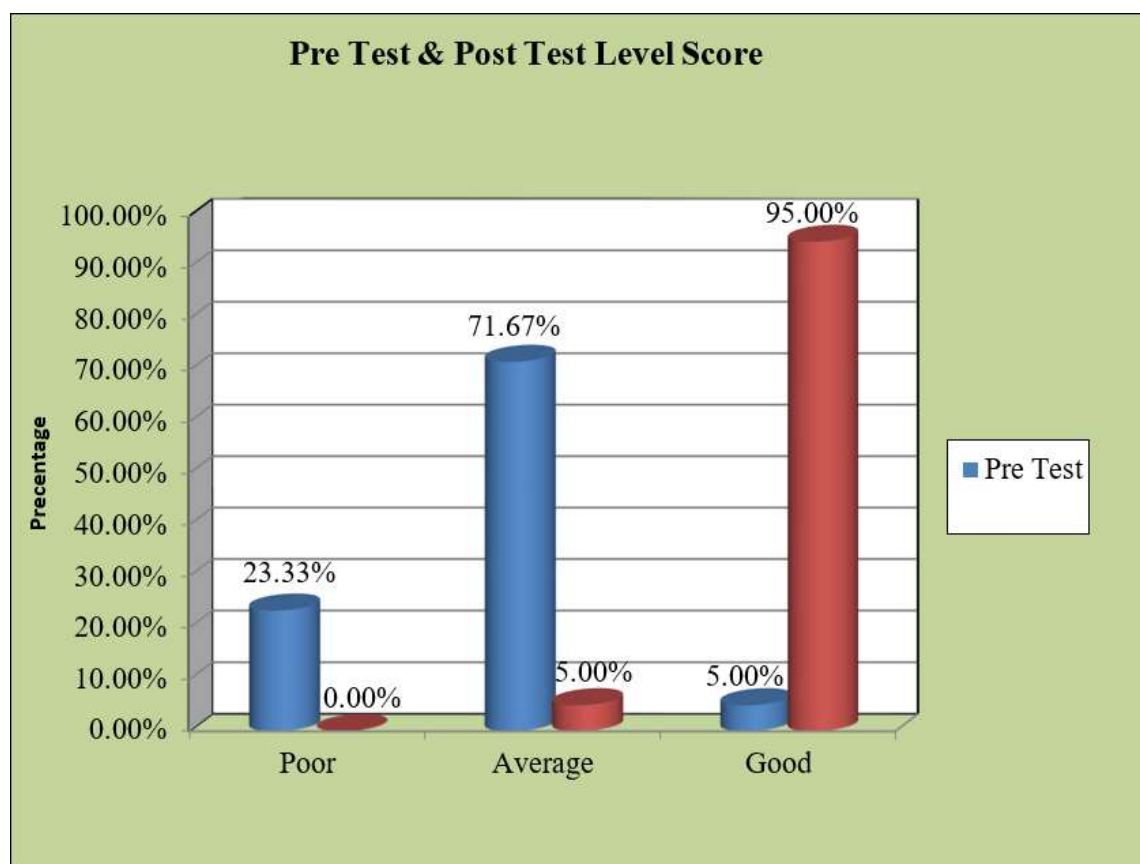


Figure - 11: Cylindrical diagram shows distribution of subject overall pre-test & post-test level knowledge score

Table-3 and figure 11, shows that the majority (23.33%) of staff nurses in pre-test had an Poor knowledge score (0-38%) and 71.67% of staff nurses had an Average knowledge score (39-69%) and 5.00% having

Good knowledge score (70-100%). The 00.00% of staff nurses in post-test had an Poor knowledge score (0-38%) and 5.00% of staff nurses had an Average knowledge score (39-68%) and 95.00% of staff nurses had an Good knowledge score (69- 100%).

Aspect of knowledge	Respondent Knowledge			
	Max-Score	Mean	S.D.	Mean %
Introduction of VAP	7	3.45	.87	49.28
Definition, Risk Factor, P/P, C/F of VAP	8	4.06	1.08	50.75
D/E and Prevention of VAP	11	5.3	1.66	48.18
Total	26	12.81	3.61	49.26

Table – IV: Distribution of Frequency And Percentage Pre-Test Knowledge Of Different Aspects Of Structure Teaching Program Regarding Prevention Of VAP

The above table 4, shows the pre-test knowledge level of different aspects of Structure Teaching Program Regarding prevention of ventilator associated pneumonia. The mean difference was found 12.81 and Mean percentage was found 49.26.

Aspect of knowledge	Respondent Knowledge			
	Max-Score	Mean	S.D.	Mean %
Introduction of VAP	7	6.3	.58	90
Definition, Risk Factor, P/P, C/F of VAP	8	7.08	.71	88.5
D/E and Prevention of VAP	11	9.58	1.13	87.09
Total	26	22.96	2.42	88.30

Table -V Aspect Wise Analysis on Post Test Knowledge About Different Aspects of Structure Teaching Program Regarding Prevention Of VAP

The above table 5, shows the post-test knowledge level about different aspects of Structure Teaching Program Regarding prevention of ventilator associated pneumonia. The mean difference was found 22.96 and Mean percentage was found 88.30.

Aspect of knowledge	Pre (X)			Post (Y)			Effectiveness (Y-X)		
	Mean	S.D.	Mean %	Mean	S.D.	Mean %	Mean	S.D.	Mean%
Introduction of VAP	3.45	.87	49.28	6.3	.58	90	2.85	-.29	40.72
Definition, Risk Factor, P/P, C/F of VAP	4.06	1.08	50.75	7.08	.71	88.5	3.02	-.37	37.75
D/E and Prevention of VAP	5.3	1.66	48.18	9.58	1.13	87.09	4.28	-.53	38.91
Total	12.81	3.61	49.26	22.96	2.42	88.30	10.15	-1.19	39.04

Table – 6 Effectiveness of Aspect Wise Analysis About Different Aspects Of Structure Teaching Program Regarding Prevention of VAP

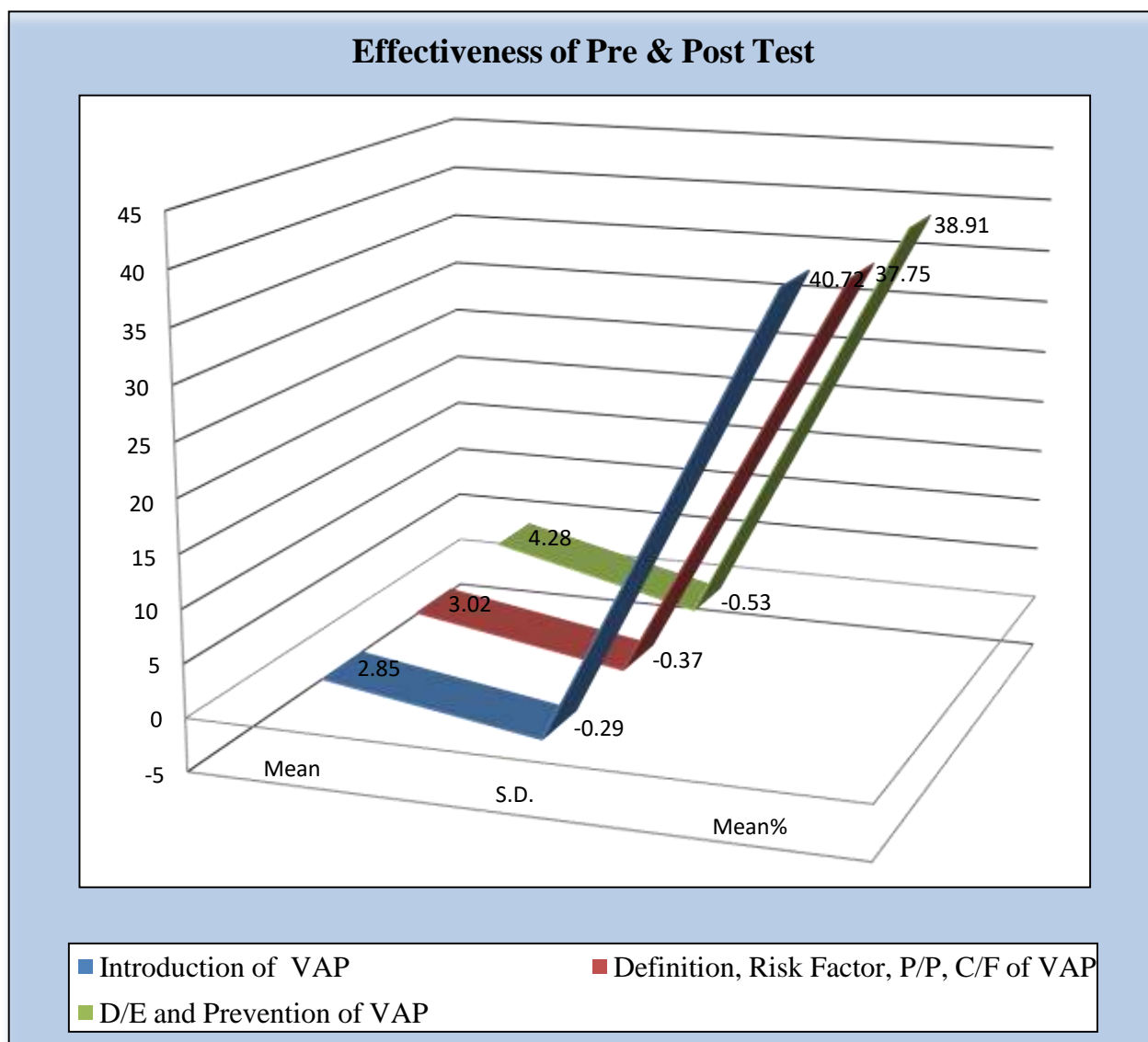


Figure 12, Line diagram shows the percentage distribution of overall effectiveness of Structure teaching programme in mean percentage is 39.04%. The mean difference is 10.15

Cat	N	Mean	Std. Deviation	Mean Difference	t-test
Pre-test	60	12.81	3.61	10.15	6.095
Post-test	60	22.96	2.42		

Table – 7 Comparison Knowledge Score of Pre and Post Group

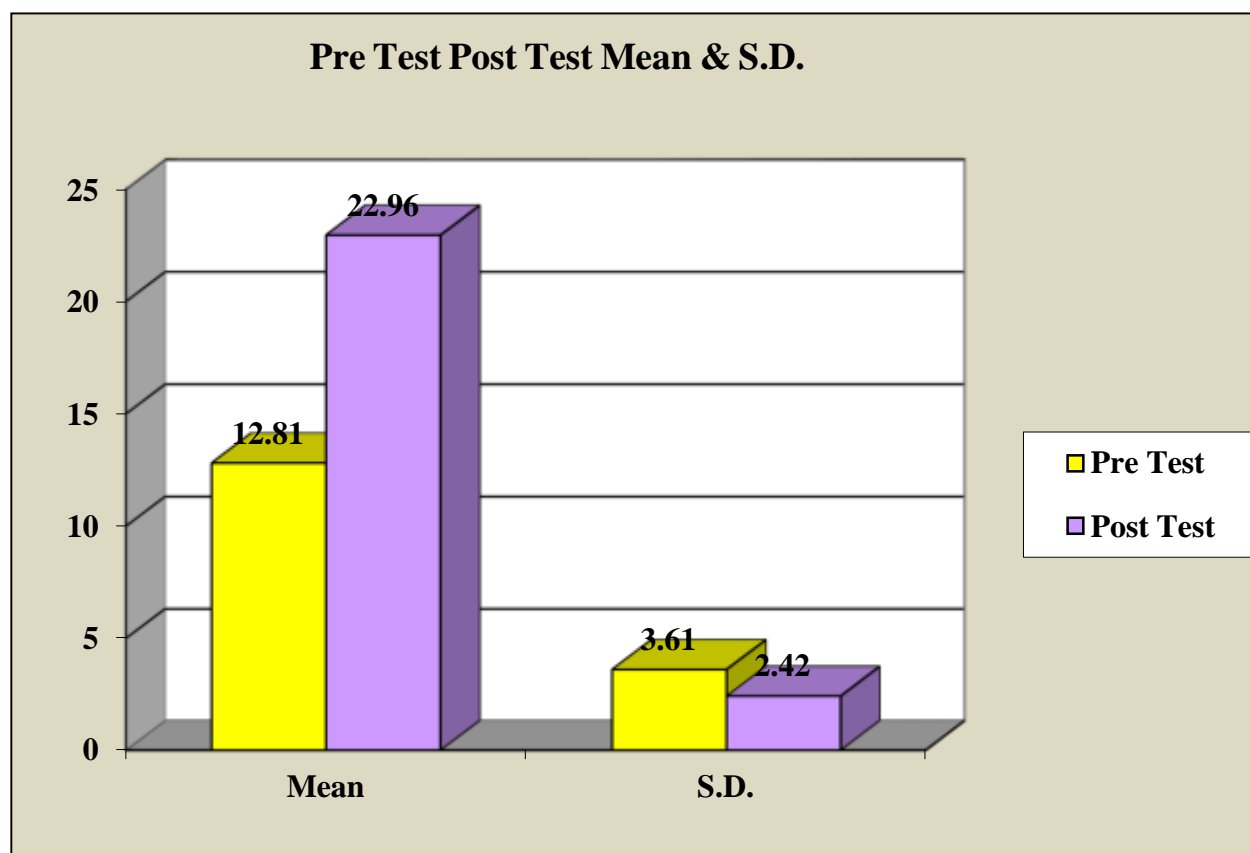


Figure 13, Bar diagram shows that which indicates that Mean & S.D of Pre Vs Post i.e. Pre group are 12.81 ± 3.61 , Post are 22.96 ± 2.42 . As per the table the mean difference of pre Vs post group Selected Hospital in Jaipur is (10.15) and the t-ratio was statistically significant as the obtained value (6.095) is higher than the tabulated value (1.97) required for t-ratio to be significant at .05 level of confidence.

Section –III

This section deals with association between the level of knowledge on structure teaching program and demographic variable. It was associated by using chi-square test.

	Demographic Variables	Frequency(f)	Poor	Average	Good	Chisquare	d.f	Table Value
1	Age (in years) Status							
	a) 21-30 Years	45	0	3	42	1.445	4	9.488
	b) 31-40 Years	13	0	0	13			
	c) 41-50 Years	2	0	0	2			
	d) Above 50 Years	-	-	-				
2	Gender Status							
	a).Male	25	0	1	24	0.087	2	5.991
	b). Female	35	0	2	33			
3	Type of Basic Nursing Preparation							
	a).GNM	35	0	2	33	0.644	4	9.448
	b) B.Sc. Nursing	15	0	1	14			
	c) Post Basic B.Sc. Nursing	10	0	0	10			
	d) M. Sc Nursing	-	-	-	-			
4	Working Experience in ICU							
	a) 0-5 years	37	0	2	35	1.8306	4	9.488
	b) 6-10 years	14	0	1	13			
	c) 11-15 years	9	0	0	9			
	d) Above 16 years	-	-	-	-			

5	Total year of clinical Experience							
	a) 0-10 years	53	0	3	50	1.3643	4	9.488
	b) 11-20 years	5	0	0	5			
	c) 21-30 years	2	0	0	2			
	d) Above 31 years	-	-	-	-			

Table – 8 Association Between Knowledge on Structure Teaching Program with Selected Demographical Variables

Conclusion

The whole study was cost effective, simple and carried out in an acceptable way to assess the level of knowledge regarding Prevention of Ventilator Associated Pneumonia among Staff Nurses working in Selected Hospitals Jaipur and a structure teaching program had given to staff nurses. The results show that the effectiveness of structure teaching program had association with demographic variables.

1. Data presented in the table revealed that there is a no significant association between the knowledge among staff nurses about palliative care with their age as the calculated Chi-square value 1.445 was lesser than the tabulated value 9.488 at $p > 0.05$.
2. Data presented in the table revealed that there was no significant association between the knowledge among staff nurses about Prevention of Ventilator Associated Pneumonia with their Gender as the calculated Chi-square value 0.078 is lesser than the tabulated value 5.991 at $p > 0.05$.
3. Data presented in the table revealed that there was no significant association between the knowledge among staff nurses about Prevention of Ventilator Associated Pneumonia with their educational status as the calculated Chi-square value 0.644 is lesser than the tabulated value 9.488 at $p > 0.05$.
4. Data presented in the table revealed that there was no significant association between the knowledge among staff nurses about Prevention of Ventilator Associated Pneumonia with their type of working experience in ICU as the calculated Chi-square value 1.8306 is lesser than the tabulated value 9.488 at $p > 0.05$.

5. Data presented in the table revealed that there was no significant association between the knowledge among staff nurses about Prevention of Ventilator Associated Pneumonia with their years of clinical experience as the calculated Chi-square value 1.364 is less than the tabulated value 9.288 at $p > 0.05$

No.	Characteristics	Df	Chi-square value	Table value	Result
			Knowledge		
1	Age in year	4	1.445	9.488	N.S.*
2	Gender	2	0.078	5.991	N.S.*
3	Type of Basic Nursing Preparation	4	0.644	9.488	N.S.*
4	Working experience in ICU	4	1.8306	9.488	N.S.*
5	Years of Clinical Experience	4	1.364	9.488	N.S.*

*S- Significant***

*NS- Non-Significant**

Table – 9 Abstract of Chi – Square Result of Demographic Characteristics and Knowledge

Table-3.1, reveals Chi-Square value of personal experience with Prevention of Ventilator Associated Pneumonia shows that statistically there is significant association between level of knowledge and demographic characteristics. Chi-square values of age, gender, basic nursing preparation, working experience, clinical experience show that statistically there is no significant association between level of knowledge and demographic characteristics.

Summary

This chapter deal with the analysis and interpretation of data collected through the structured knowledge questionnaire. The association between the knowledge among staff nurses on Prevention of Ventilator Associated Pneumonia with their selected demographic variables sswere also done.

Summary, Major Findings, Implications, Recommendations and Conclusion

This chapter deals with a brief summary of the study undertaken including the discussion, summary, major findings, conclusion from the findings, implications of the study, limitations and recommendations for future research in this field.

Discussion

The findings of the study have been discussed with reference to the objectives of the study. The pre-testing of staff nurses on the knowledge regarding Prevention of Ventilator Associated Pneumonia shows that staff nurses had less knowledge about Prevention of Ventilator Associated Pneumonia in all the ICU.

Objectives of the study

- To assess the level of knowledge of staff nurses regarding Prevention of Ventilator Associated Pneumonia.
- To develop and validate the structure teaching programme.
- To assess the effectiveness of structure teaching programme.
- To find out association between knowledge score of undergraduates with their selected demographic variables.

Hypothesis

H1: There will be no significant difference in the pre-test and post-test knowledge score regarding Prevention of Ventilator Associated Pneumonia.

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

Assumptions**The study assumes that:**

- The staff nurses may have some knowledge regarding prevention of ventilator associated pneumonia.
- Demographic variables may influence the knowledge regarding prevention of VAP.
- STP is useful strategy to increase knowledge.
- Staff nurses knowledge regarding prevention of ventilator associated pneumonia may decrease the future incidence of VAP.

The conceptual framework of the present study was developed by the investigator based on Imogene King's Goal Attainment Model. This model focus on interpersonal relationship between the client and staff nurse and this interaction is influenced by the perception leads to both client and nurses. This interaction led to mutual goal setting that are to be achieved by the subjects, in the present study the interaction took place between the investigator and staff nurses.

In this study, Process involves:

- Development of structure teaching program
- Administration of structure teaching program

In this study the assessment of knowledge of staff nurses regarding Prevention of Ventilator Associated Pneumonia using post-test and evaluating the effectiveness of structure teaching program.

The tool selected for the present study was to collect demographic data and structured knowledge questionnaire to assess the level of knowledge of staff nurses. The tool was validated by 5 experts.

The present study was conducted in the month of May-June. After obtaining the formal permission from the concerned authority, the study was conducted in Apex Hospital and BMCHRC Hospital, Jaipur.

Reliability of the tool was established by using split half method for structured knowledge questionnaire and the result was $r = 0.75$. Pilot study was conducted on 10 samples.

Through Non-probability convenient sampling technique, 60 samples were selected to assess the level of knowledge.

On day 1st, informed written consent was obtained from each sample after explaining the purpose of the study and was given assurance for keeping the information confidential. A pre-test was conducted by administering structured questionnaire, and then it was followed by administering structure teaching program on Prevention of Ventilator Associated Pneumonia. The pre-test was administered for each staff nurse. On the 8th day after administering pre-test, a post- test was administered by using the same tool which was used in the pre-test.

The findings of the study reveal that the mean differences of the pre-test and post-test which is statistically significant at 0.05 levels. Hence it indicates a significant difference and effectiveness of structure teaching program in terms of knowledge gain by the staff nurses.

This clearly indicates that the level of knowledge of post-test among staff nurses was higher than the pre-test. This shows that structure teaching program was effective in increasing the knowledge level of the samples regarding Prevention of Ventilator Associated Pneumonia.

The findings of this study reveals that there is a no significant association between the knowledge and age of staff nurses about Prevention of Ventilator Associated Pneumonia with their age ($p>0.05$), there was no significant association between the knowledge and gender among staff nurses about Prevention of Ventilator Associated Pneumonia with their Gender ($p>0.05$). There was no significant association between the knowledge and type of basic nursing preparation ($p>0.05$).

The study shows that there was no significant association between the knowledge among staff nurses about Prevention of Ventilator Associated Pneumonia with their working experience in ICU ($p>0.05$), there was no significant association between the knowledge among staff nurses about Prevention of Ventilator Associated Pneumonia with their years of clinical experience ($p>0.05$).

Major Findings of the Study

Findings Related to Demographic Variables

- In the present study, out of 60 samples 75.00% respondents belong to age group of 21-30 years, 21.67% respondents belong to age group of 31-40 years, 3.33% respondents belong to age group of

41-50 years and no one was found in the age group of above 50 years.

- 41.70% respondents were males and 58.30% respondents were females.
- 58.33% respondents had completed GNM course, 25.00% completed B.Sc. Nursing, and 16.67% respondents had completed Post Basic B.Sc. Nursing and no respondent did M.Sc. Nursing.
- 61.70% respondents had completed 0-5 years of experience in ICU, 23.30% of respondent had 6-10 years of experience in ICU, 15.00% of respondents had 11- 15 years of experience in ICU and no one respondent had 16 years & above experience in ICU.
- 88.43% respondents had completed 0-10 years of clinical experience, 8.33% of respondent had 11- 20 years of clinical experience, 3.33% of respondents had 21- 30 years of clinical experience and no one respondent had 31 years & above clinical experience.
- 33.33% respondents were in got information of ventilator association pneumonia and 66.67% respondents were not had any information of ventilator association pneumonia.

II. Findings Related to Knowledge Scores Before and After Administering the Planned Teaching Program

The majority 23.33% of staff nurses in pre-test had an Inadequate knowledge score (0-38%) and 71.67% of staff nurses had an Average knowledge score (39-69%) and 5.00% having Good knowledge score (70-100%). The 0.00% of staff nurses in post-test had an Poor knowledge score (0-38%) and 5.00% of staff nurses had an Average knowledge score (39- 69%) and 95% of staff nurses had an Good knowledge score (70-100%).

The pre-test knowledge level of different aspects of Structure Teaching Program Regarding Prevention of Ventilator Association Pneumonia, the mean difference was found 12.81 and Mean percentage was found 49.26 and the post-test knowledge level about different aspects of Structure Teaching Program Regarding Prevention of Ventilator Association Pneumonia, the mean difference was found 22.96 and Mean percentage was found 88.30.

III. The Association of Level of Knowledge Scores with the Selected Demographic Variables

The result reveals that there is no significant association between the age and knowledge scores, as the calculated χ^2 value (1.445) is lesser than table value (9.488) at $p < 0.05$.

The result reveals that there is no significant association between gender and knowledge scores, as the calculated χ^2 value (0.078) is lesser than table value (5.991) at $p < 0.05$.

There is no significant association between basic nursing preparations and knowledge scores, as the calculated χ^2 value (0.644) is lesser than table value (9.448) at $p < 0.05$.

There is no significant association between working experience in ICU and knowledge scores, as the calculated χ^2 value (1.830) is lesser than table value (9.488) at $p < 0.05$.

There is no significant association between year of clinical experience and knowledge scores, as the calculated χ^2 value (1.364) is lesser than table value (9.488) at $p < 0.05$.

Implications

The findings of the study have implication for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

Several implications can be drawn from the present study for nursing practice. Content of the STP will help the nursing personnel working in the hospital for reinforcing their knowledge on Prevention of Ventilator Association Pneumonia.

Since there is less knowledge regarding Prevention of Ventilator Association Pneumonia among staff nurses, every nurse should make use of this result to update their knowledge.

Any teaching strategy which is simple, clear and attractive, allows the learner to follow instructions easily. Health information can be imparted through various methods like lectures, mass media, pamphlets, booklets and display etc. Hence nurses should take keen interest in preparing different teaching strategies suitable for the community.

Nursing Education

The Nursing education is the key component of improving the knowledge of an individual. Quality care through excellence in advance nursing education is adopt to meet the increasing demand of good quality of nursing.

Education is the integral part of governance agenda. The nursing curriculum should include topics, which enhances knowledge related to Prevention of Ventilator Associated Pneumonia using different methods of teaching.

The study has improved the importance of knowledge in nursing regarding formulation of structure teaching program.

The finding will help the nursing students to understand about the need to be equipped with adequate knowledge.

The finding will help the nursing faculty to give more importance for planning and organizing the structure teaching program to improve the knowledge of clinical practicing students.

Nursing Administration

- The Nurse administrators should plan, organize and provide materials for the effective awareness programs regarding Prevention of Ventilator Association Pneumonia, and should be open for discussion and suggestions.
- The Nurse administrators should modify the behavior of the nurses to match the corporate level of clients, so that everybody will have faith in health teachings given by nurses.
- Nurses as administrators should take great interest in encouraging nurses to learn more about Prevention of Ventilator Associated Pneumonia and to use their knowledge in practice.
- Nurse Administrator should formulate policies and adopt various modalities of Prevention of Ventilator Associated Pneumonia.
- This is possible if the nurse as an administrator takes initiatives in imparting the health information through printed materials, in the form of booklets, pamphlets, and posters to staff nurses who can read and write, and arrange for group teaching for staff nurses who cannot use printed materials.

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- Nurse Administrators should take initiative in organizing in-service education programme for nurses and motivate nurses to participate in such activities.
 - The nurse administrators should see that enough support is provided in terms of manpower, money and material for disseminating information about Prevention of Ventilator Association Pneumonia.

Nursing Research

Nursing Research is the most required field to be developed and it is only through research that nurses can prove their proficiency in the field of education, practice and administration in healthcare aspects.

Research can help in increasing the body of nursing knowledge which improve the care provided.

- The study will be a reference for research scholars.
- There is a need for advanced research for improving the nursing services.
- Various methods can be used to strengthen the knowledge of the people by the researcher, which should be published for the benefit of those who are not able to participate in the studies.

Use of research findings should become the part of quality assurance as evaluation to individual performance as a whole.

Delimitations

The research will be confined to nursing staffs;

- Who are working in selected hospital.
- Who are willing to participate in the study.

Recommendations

On the basis of the findings of the study, it is recommended that:

- A similar study may be replicated with a larger population.
 - A comparative study can be conducted to assess the level of knowledge between government and private hospitals regarding Prevention of Ventilator Associated Pneumonia.
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- A survey to assess the knowledge, beliefs regarding Prevention of Ventilator Associated Pneumonia may be undertaken.
 - Similar study can be done to assess the knowledge, attitude and practice of Prevention of Ventilator Associated Pneumonia among staff nurses.
 - Similar study can be done to assess the effectiveness of structure teaching program on knowledge, regarding Prevention of Ventilator Associated Pneumonia among staff nurses.
 - Studies may be conducted to assess the knowledge on Prevention of Ventilator Associated Pneumonia. Structured Teaching programs may be conducted in different groups of staff nurses on Prevention of Ventilator Associated Pneumonia.

Conclusions

The purpose of the study was to assess the effectiveness of structure teaching program (STP) regarding Prevention of Ventilator Associated Pneumonia among staff nurses working in selected hospitals at Jaipur city.

The whole study was cost effective, simple and carried out in an acceptable way to assess the level of knowledge on Prevention of Ventilator Associated Pneumonia among staff nurses. The result shows that the staff nurses had inadequate knowledge regarding Prevention of Ventilator Association Pneumonia; hence the researcher felt the need to develop a STP to enhance the knowledge on Prevention of Ventilator Associated Pneumonia.

Summary

This chapter dealt with a brief summary of the study undertaken including the discussion, summary, major findings, and conclusion from the findings, implications of the study, limitations and recommendations for future research in this field.

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