



“A Study To Assess The Effectiveness Of Plan Teaching Programme On Knowledge Of Staff Nurses Working In Icu Regarding Prevention Of Ventilator Associated Pneumonia In Batra Hospital And Medical Research Centre, Tuglakhabad, New Delhi.”

¹Mrs. Nazima Thomas, ²Mrs. Nidhi A. Joseph,

¹Associate Professor, ²Tutor,

¹Medical Surgical Nursing,

¹Lakshmi Bai Batra College of Nursing, Affiliated to Indraprastha University, New Delhi, India

Abstract: An ICU is a specialized section of a hospital that provides comprehensive and continuous care for patients who are critically ill and who can benefit from treatment. Most patients in ICU require mechanical ventilation. A machine designed to move breathable air into and out of the lungs, to provide breathing for a patient who is physically unable to breathe and is admitted in ICU. VAP is the most common nosocomial infection in ICUs which is responsible for increased stay due to prolonged ventilator days. VAP is the type of lung infection that occurs in patients who are on mechanical ventilation for more than 48 hours. The aim of the study is to critically review the incidence and identify the various risk factors and conclude specific measures to be undertaken to prevent VAP. In this study we found that out of 30 nurses, (76.66%) staff nurses belongs to the age group of 25 to 30, 27(90%) were female followed by 3(10%) as well as 16 (53.33%) were Christians followed by 14(4.66%) were Hindu. Most of the nurses were B.sc (Hons) nursing that is 19 (63.33%) followed by GNM 11 (36.6%).

Regarding years of experience, most of the nurses i.e., 20 (66.66%) had less than 5 years of experience, followed by 8 (26.66%) nurses who had 5 - 10 years of experience, then 1 (3.33%) have experience of 10-15 years and above 15 years. Out of 30 nurses, 19 (63.33%) were unmarried and 11 (36.66%) were married. Out of 30 nurses, 16 (53.33%) had attended In-service programme on Ventilator Associated Pneumonia before and 14 (46.66%) had not as well as out of 30 Nurses, 10% had very good knowledge, 33.33% had good knowledge, 26.66% had average knowledge and 30% had poor knowledge about Ventilator Associated Pneumonia.

Mean knowledge score and standard deviation for pre-test was 17.7 and 3.99, post test score was 26.7 and 1.24 median for pretest was 17 and post-test was 27.

I. INTRODUCTION

It is the most common nosocomial infection diagnosed in the intensive care unit (ICUs). VAP is defined as pneumonia that occurs 48 hours more after endotracheal intubation or tracheostomy caused by infectious organisms not present on incubating at the time of mechanical ventilation was started. It can be of two types:

- I. Early onset VAP which is defined as VAP that occurs within the first 4 days of ventilation.
- II. Late onset VAP which is defined as VAP that occurs more than 4 days after initiation of mechanical ventilation.

VAP is the most common and lethal form of hospital-acquired infection, mostly occurring in ICUs. It occurs in approximately 28% of patients who need mechanical ventilation for more than 48 hours. 46% patients who develop VAP die while 32% of ventilated patients never develop it¹.

VAP is a growing problem in health care facilities which increases the cost of patient care and increases patient care time, hospital length of stay and patient morbidity.

The centre for disease control (CDC) established recommended guidelines to decrease the rise of VAP. It is the best practice interventions that nurses should follow when caring for mechanically ventilate patients. The 2003 CDC guidelines reported that 63% of admitted patients in the ICU have oral colonization associated with a pathogen resulting from VAP (Cason, Tyner, Saunders & Broome, 2007). The CDC provided a set of 7 guidelines to reduce risks related to hand washing, wearing gloves, suctioning, elevated head of bed, education, oral hygiene program and use of antiseptic².

According to CDC, pseudomonas aeruginosa and gram positive staphylococcus aureus were the two most common bacteria linked to VAP

(Babcock et. al.2004). Pseudomonas aeruginosa, a leading cause of nosocomial infection and most common antibiotic resistant pathogen causing VAP is responsible for 10% of all hospital-acquired infection(El Soth et.al.2008)³. Infections caused by these organisms are often severe, life threatening, difficult to treat and result in adverse outcomes.

Despite major advances in techniques in causing for patients whose respiratory tract are instrumented and routine use of efficient disinfection procedure for the respiratory equipment, nosocomial bacterial pneumonia continues to complicate the course of 7-41% of patient receiving continuous mechanical ventilation⁴. VAP reduces rapid diagnosis and initiation of the appropriate antibiotic treatment, since studies have shown that the delayed administration of appropriate antibiotic therapy in patients with VAP has been associated with excess hospital mortality.

The incidence rates calculated using 1000 ventilator days as denominator reflect more accurately VAP risks rates. VAP rates range from 4-14/1000 ventilator days in United States and 10-52.7/1000 days in developing countries. A number of factors have been suspected or identified to increase the rise of VAP in various studies. VAP causing pathogens also vary among different settings⁵. Therefore, knowledge of the incidence of VAP, associated risk factors and common pathogens using VAP can help in development of effective preventive measures, which in turn will decrease the mortality and morbidity, duration of treatment and hospital stay associated with VAP.

Several standards of care have been developed in an attempt to reduce the incidence of VAP. Some interventions are costly, such as the use of kinetic therapy beds in intensive care setting, while others are more cost effective, raising the head of the patient's bed to a semi recumbent position. While both the interventions are having supporting incidence in the prevention of VAP, each must be evaluated based on supporting scientific knowledge, cost effectiveness and outcomes realised by the patient.

VAP occurs in 10 to 65 percent of all ventilated patients and the incidence increases with duration of mechanical ventilation 30% per day for first five days, 2% per day for 6 to 10 days and 1% after 10 days. Mortality rate is 25% and 43% with antibiotic resistance organism. Mortality rate in VAP caused by pseudomonas or acinetobacter is as high as 76%, increases ventilator support requirements and ICU stay by 4 to 3 days, increases medical cost and increases hospital stay by 4 to 9 days. Nurses have taken an aggressive role in developing best practice standards in an attempt to prevent VAP⁶.

One such standard includes elevation of head of patient bed. Nurses plays an important role in patient positioning which has an important role in patient positioning which has been suspected to assist with the reduction of VAP (CASON, et. al. 2007). This literature review will focus on guidelines affecting the prevention and control of VAP through positioning.

VAP accounts for almost half of all infections in critically ill patients, increasing length of stay in ICU with prolonged mechanical ventilation (Van Nieuwenhoven.et.al.2006).VAP is a major complication of mechanical intubation and a serious concern during a patient's stay. Subsequent aspiration of contaminated secretions along

with colonization of aero digestive tract increases morbidity and mortality as well as an increased cost of health care⁷.

3.1 Population and Sample

In the present study, the population comprises of staff nurse from intensive care units of Batra hospital and Medical research Centre, New Delhi.

The samples size consisted of various demographic variables of staff nurses working in Batra Hospital and research Centre, New Delhi.

The sample size is 30 and the sample size for the pilot study is 3.

3.2 Data and Sources of Data

For this study data were collected from the available and relatable sources, data and information from books, journals which published and non-published research studies and attempted was made to review literature through internet (sites: MEDLAR, PUBMED and MEOLINE) research and printed or published (books, journals, articles) research.

The investigator carried out an extensive review of literature on the research topic in order to gain information and insight to build the foundation of the study. The literature was reviewed under the following five headings:

- 1) Literature related to ventilator associated pneumonia.
- 2) Literature related to staff nurses' knowledge on Ventilator associated pneumonia.
- 3) Literature related to the knowledge of staff nurses regarding care of patient on a mechanical ventilator.
- 4) Literature related to practice of staff nurses regarding care of patients on mechanical ventilator.
- 5) Literature related to development and evaluation of structured teaching program on ventilator associated pneumonia.

I. RESEARCH METHODOLOGY

The quantitative experimental research approach was adopted to accomplish the objectives of the study. The convenient sampling technique was used to select 30 staff nurses who were working in Batra hospital and medical research Centre, New Delhi.

The data was collected using self-structure demographic data and a self-structured knowledge questioner.

Section 1: Findings related to demographic characteristics of the nurses

Section 2: Findings related to knowledge scores of nurses regarding ventilator associated pneumonia.

Section 3: Findings related to comparison between knowledge scores of nurses in pre-test and post test regarding ventilator

IV. RESULTS AND DISCUSSION

Section 1: findings related to demographic characteristics of the nurses.

It deals with demographic data which consists of 7 items to collect the sample characteristics, which includes age (in year), gender, religion, professional qualification, years of experience, attended in-service programme, marital status.

N=30

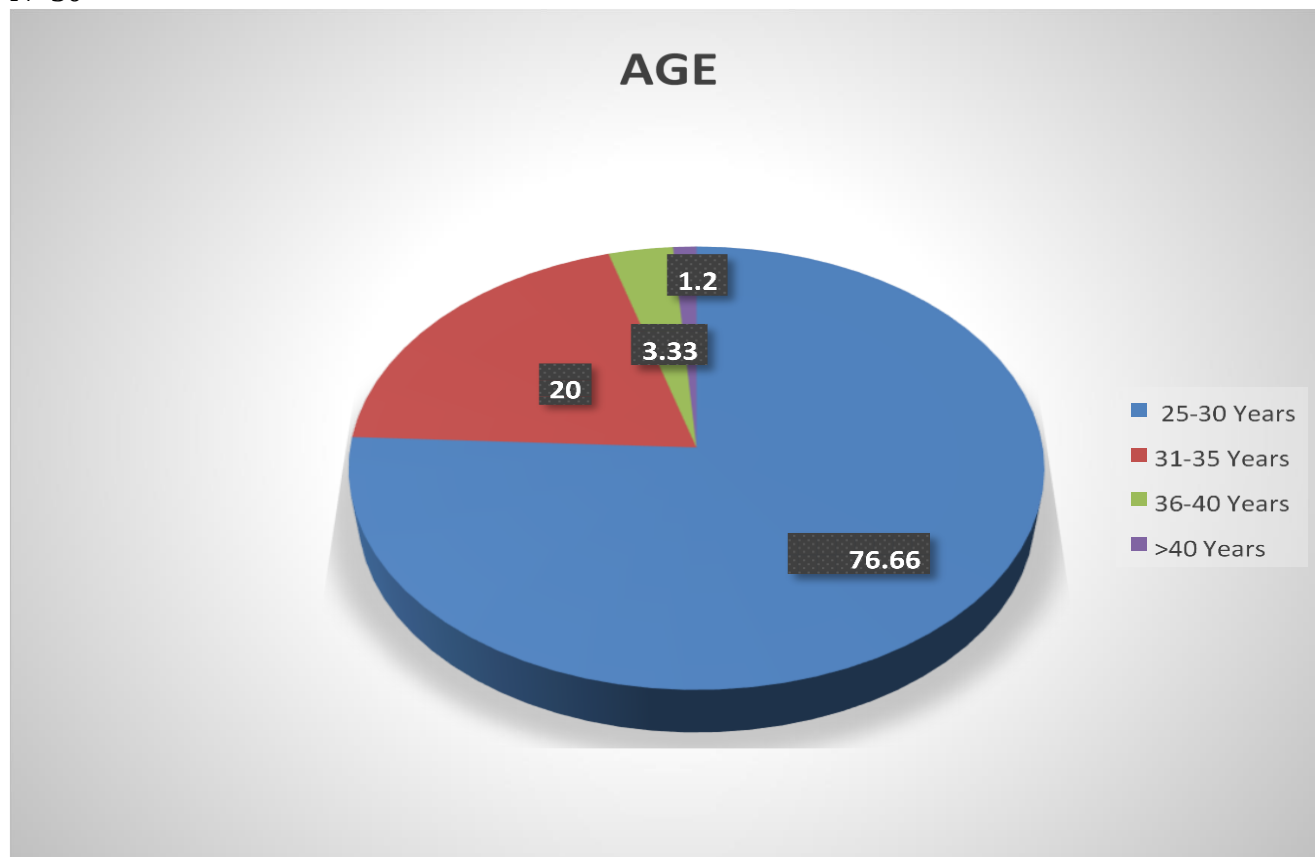


Figure 1: pie diagram illustrating distribution of nurses by their age.

Figure1: As depicted that out of 30 nurses most of them i.e 23(76.66%) belongs to the age group 25-30 year of age, followed by 6(20%) were in age group of 31-35 years and then 1(3.33%) belongs to the age group of 36-40 years of age.

N=30

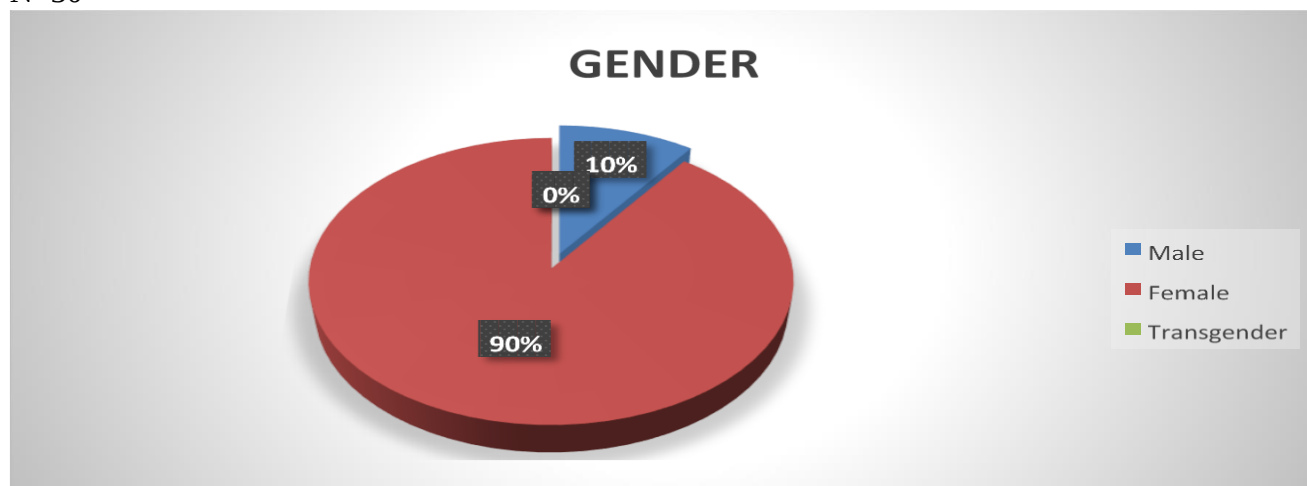


Figure 2: pie diagram illustrating distribution of nurses by their gender.

Figure 2: As depicted in the pie diagram, most of the nurses i.e. 27(90%) were females were followed by 3(10%) were male.

N=30

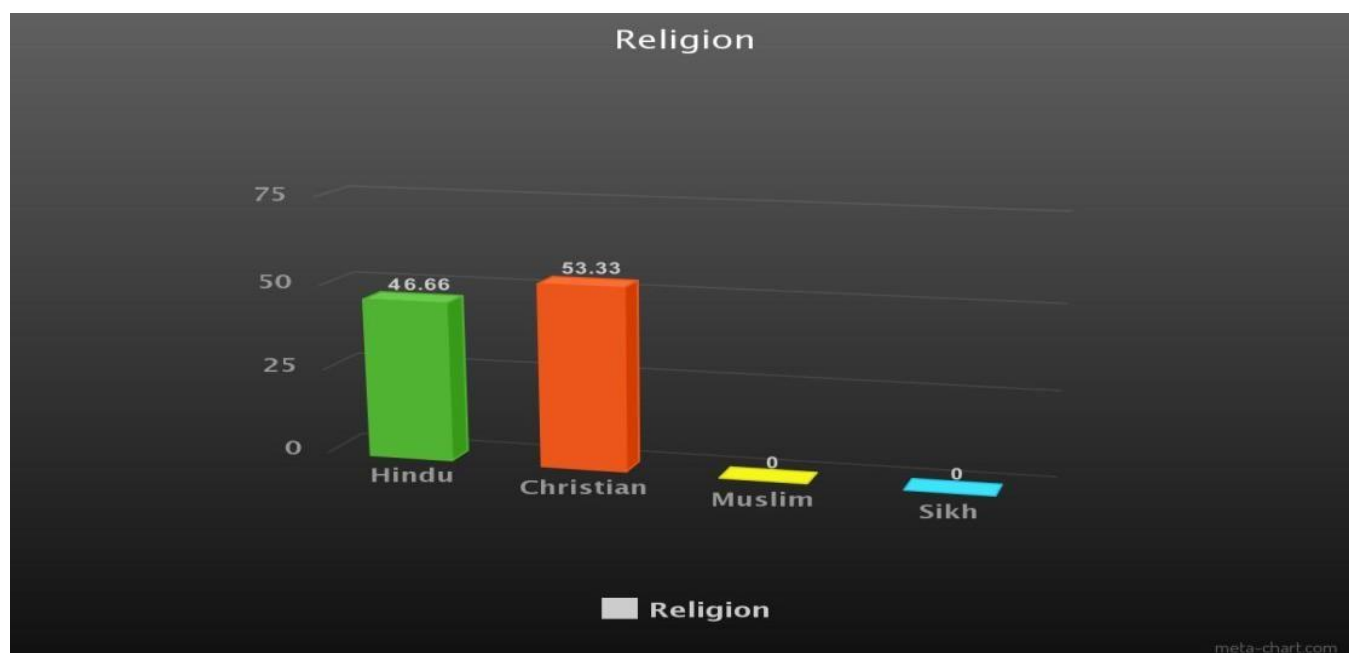


Figure 3: Bar graph illustrating distribution of nurses by the religion

Figure 3: As depicted in the Bar graph, most of the nurses i.e. 16(53.33%) were Christian followed by 14(46.66%) were Hindu.

N=30

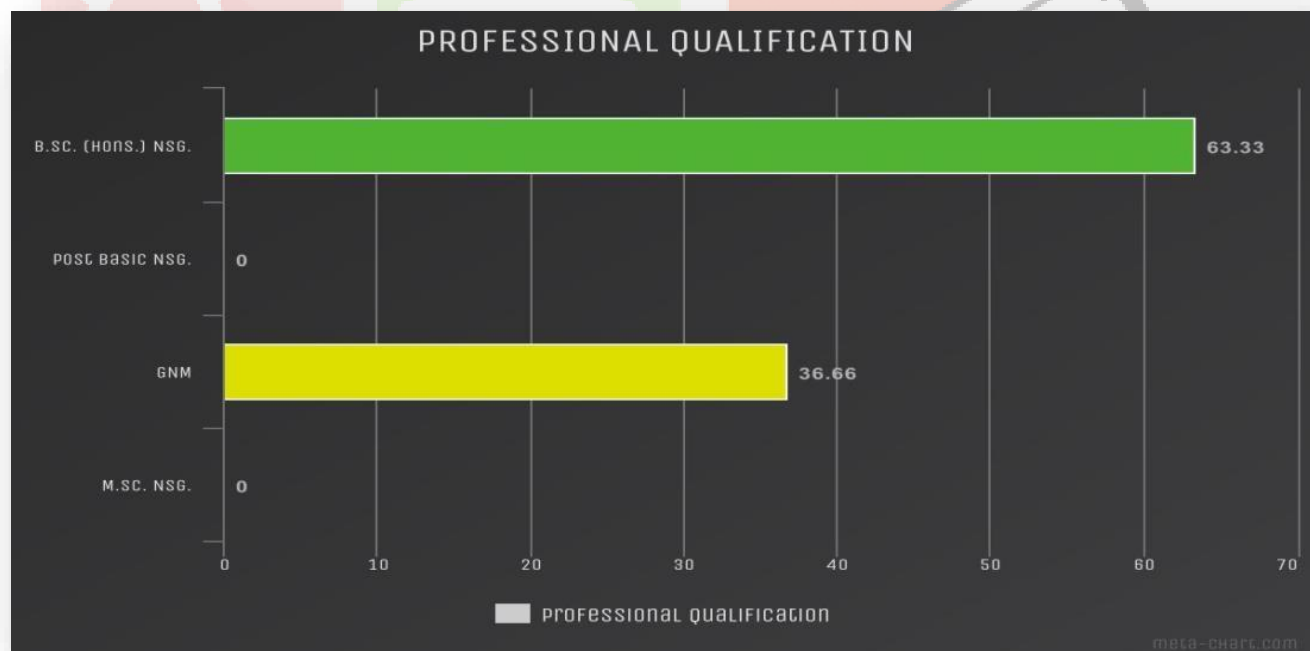


Figure 4: Bar graph illustrating distribution of nurses by Professional qualification.

Figure 4: As depicted in the Bar graph, 36.66% are GNM qualified and 63.33% are B.sc (Hons) nursing qualified.

N=30

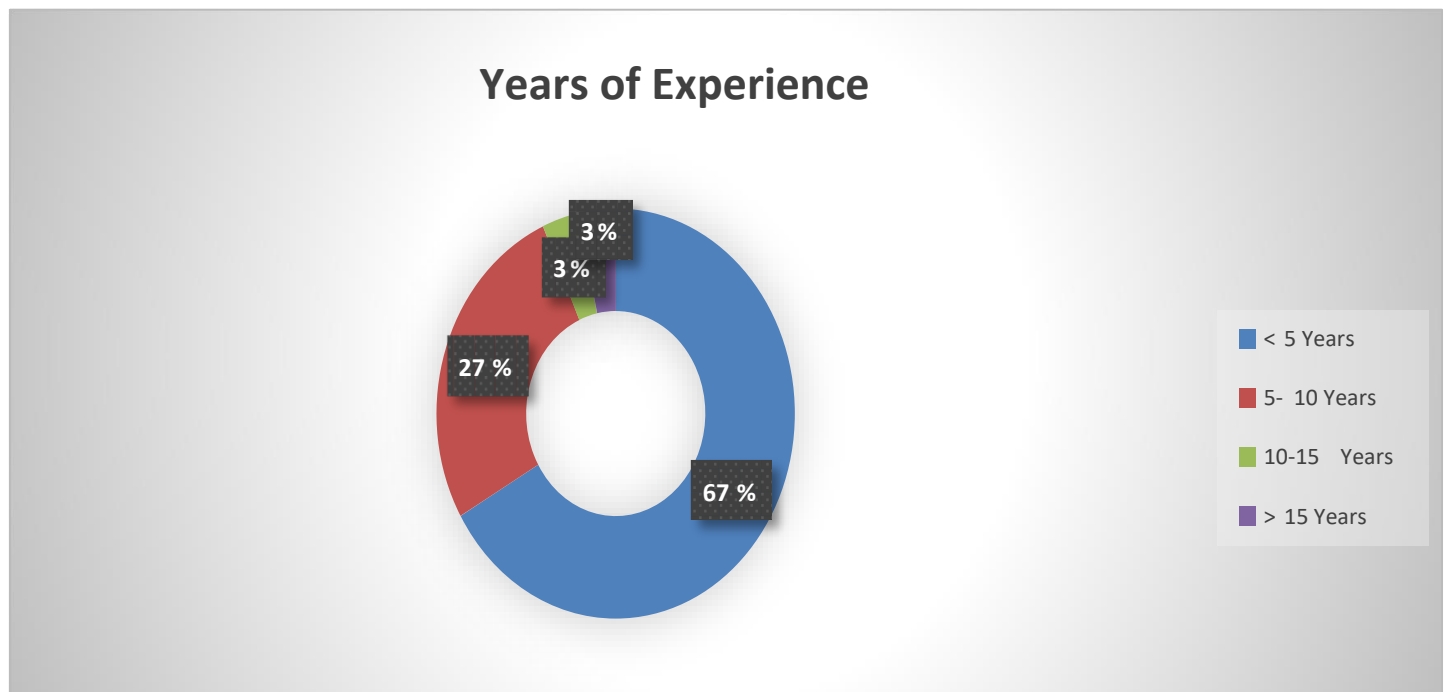
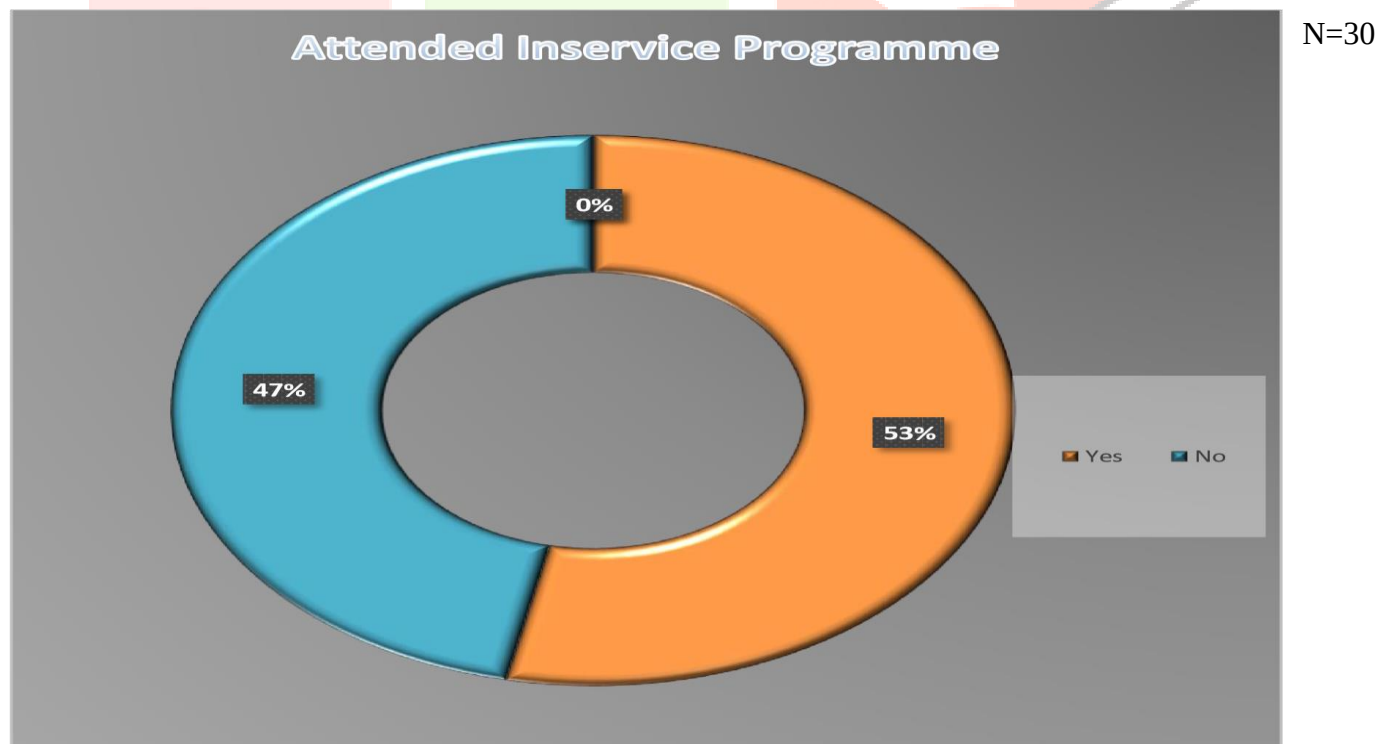


Figure 5: Doughnut illustrating distribution of nurses by the year of experience

Figure 5: As depicted in this doughnut 67% of staff nurses are having less than 5 years of experience and 3% are having more than 15 years of experience.



N=30

Figure 6: Doughnut illustrating distribution of nurses by the in-service education programme.

Figure 6: As depicted that there is 53% staff nurses have attended the in-service education and 47 of staff nurses have not attended the in-service education.

N=30

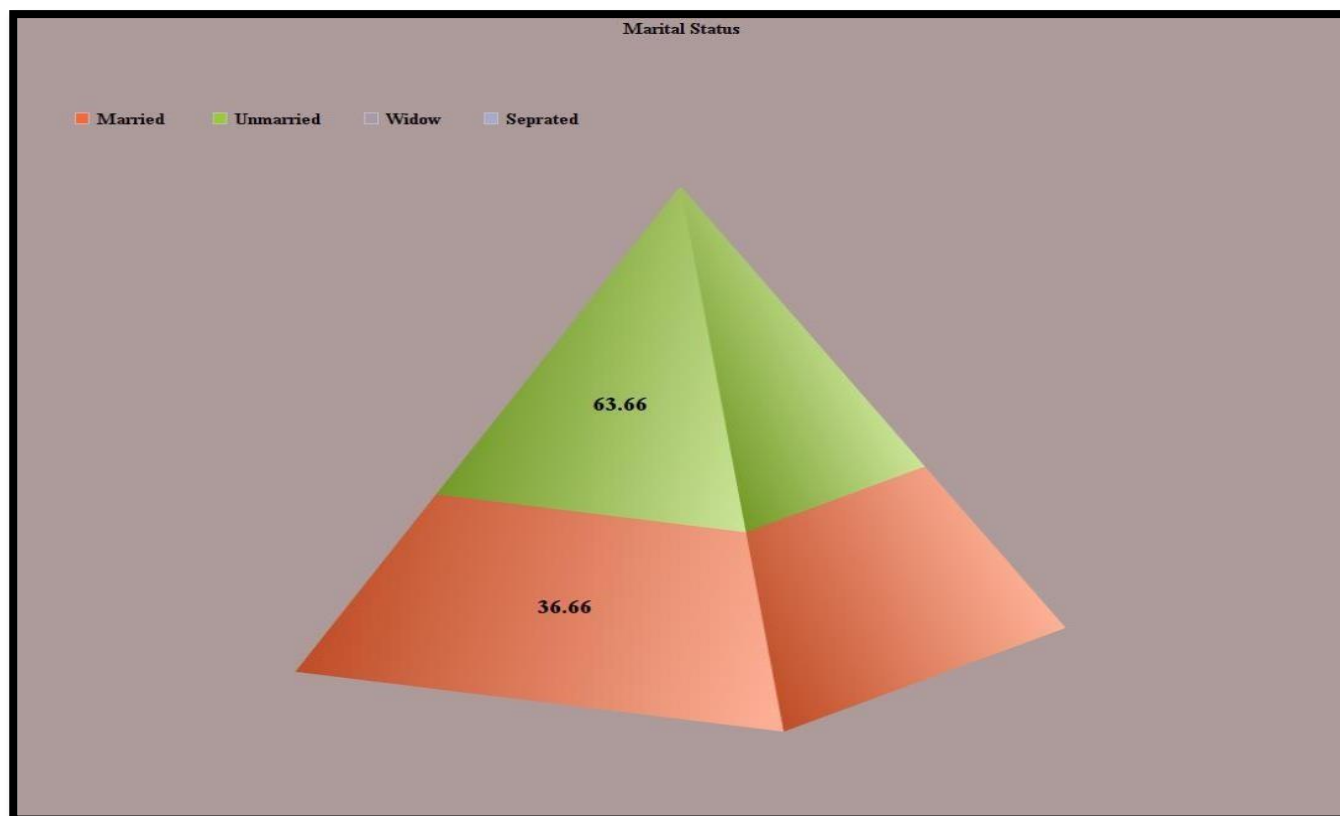


Figure 8: pyramid chart illustrating distribution of nurses by the marital status.

Figure 7: As depicted in pyramid chart out of 30 nurses, 19 (63.33%) were unmarried and 11(36.66%) were married.

SECTION 2: Findings related to knowledge of score of nurses regarding ventilator associated pneumonia in pre-test

It section describes the findings related to knowledge score of nurses regarding ventilator associated pneumonia obtaining through the structured knowledge questionnaire in pre-test. Possible range of score, mean, median, mode and structured deviation of knowledge score were obtained.

PART 1: FINDINGS RELATED TO CATEGORY OF KNOWLEDGE REGARDING VENTILATOR ASSOCIATED PNEUMONIA IN PRE TEST

This part deals with the frequency and percentage distribution according to the category of knowledge scores in pre – test.

Table 1: Frequency and Percentage Distribution of category of Knowledge scores of Nurses regarding Ventilator associated pneumonia in pre test

N=30

LEVEL OF KNOWLEDGE SCORE	OF	RANGE OF SCORE	OF	FREQUENCY	PERCENTAGE
Very Good ($\geq 75\%$)		≥ 23		03	10%
Good (61%-74%)		19-23		10	33.33%

Average (50%-60%)	15-18	08	26.66%
Poor (< 50%)	≥ 15	09	30%

N=30

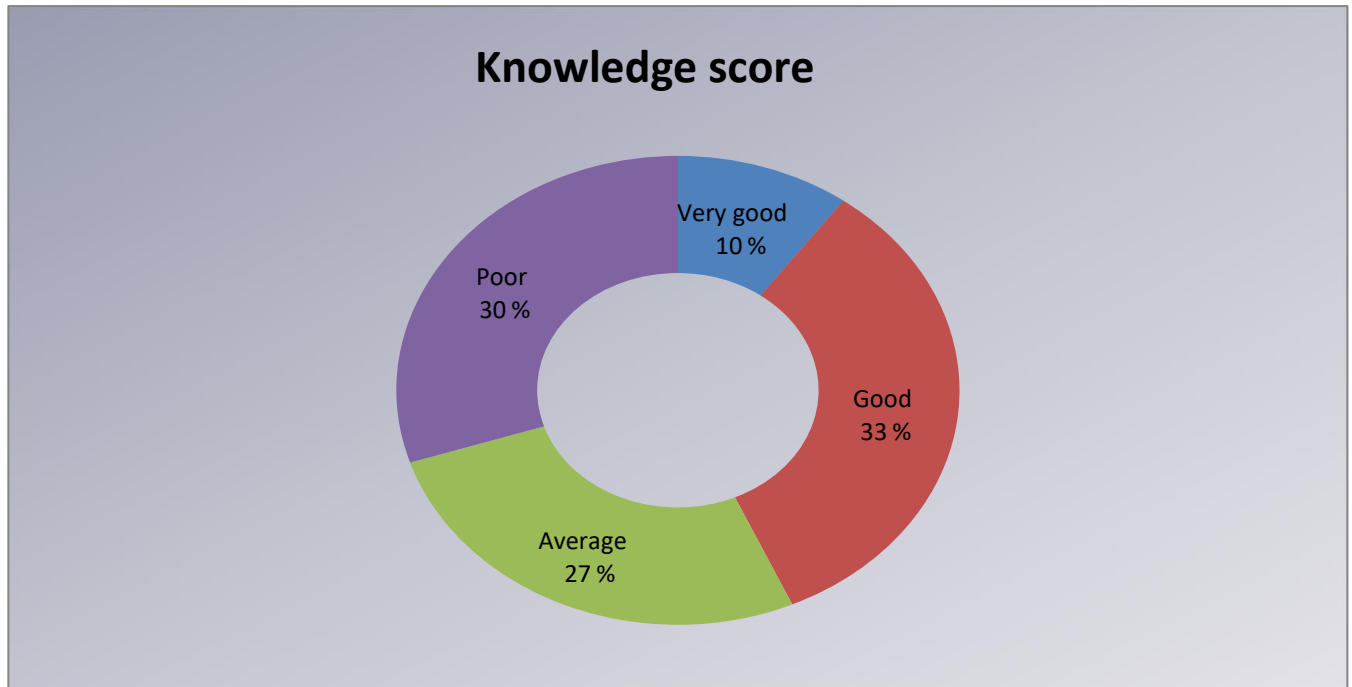


Figure 9: Doughnut Diagram illustrating Percentage distribution by the category of Knowledge score of Nurses.

Data presented in the table 1 shows that out of 30 nurses in which 10% had very good knowledge, 33.33% had good knowledge, 26.66% had average knowledge and 30% had poor knowledge about ventilator associated pneumonia (figure 9)

PART 2: MEAN, MEDIAN, MODE, STANDARD DEVIATION AND RANGE OF KNOWLEDGE SCORE OBTAINED BY NURSES REGARDING VENTILATOR ASSOCIATED PNEUMONIA IN PRE-TEST

It describes the mean, median, mode, standard deviation and range of knowledge score obtained by nurses regarding ventilator associated pneumonia in pre-test.

Table 2: mean, median, mode, standard deviation and range of knowledge score obtained by nurses regarding ventilator associated pneumonia in pre-test.

N=30

VARIABLE	POSSIBLE RANGE OF SCORES	RANGE OF OBTAINED SCORES	MEAN	MEDIAN	MODE	STANDARD DEVIATION
Knowledge	0-30	10-25	17.7	17	18	3.99

Data presented in table 2 shows that mean knowledge score of nurses were 17.7 the median was 17 and the mode was 18 with standard deviation of 3.99.

SECTION 3: FINDINGS RELATED TO KNOWLEDGE OF SCORE OF NURSES REGARDING VENTILATOR ASSOCIATED PNEUMONIA IN POST-TEST

This section describes the findings related to knowledge score of nurses regarding Ventilator Associated Pneumonia obtained through the structured knowledge questionnaire in post-test. Possible range of score, mean, median, mode and structured deviation of knowledge score were obtained.

PART 3: Frequency and Percentage distribution of Nurses by obtained Range of Knowledge scores regarding Ventilator Associated Pneumonia in Post –Test.

N=30

LEVEL OF KNOWLEDGE SCORE	RANGE OF SCORE	FREQUENCY	PERCENTAGE
Very Good ($\geq 75\%$)	≥ 23	30	100%
Good (61%-74%)	19-23	0	0%
Average (50%-60%)	15-18	0	0%
Poor ($< 50\%$)	≥ 15	0	0%

Max. Knowledge score: 30

Data Presented in table 3: shows that, out of 30 Nurses most of them, i.e. 30(100%) had very good knowledge about Ventilator Associated Pneumonia, (Figure 10).

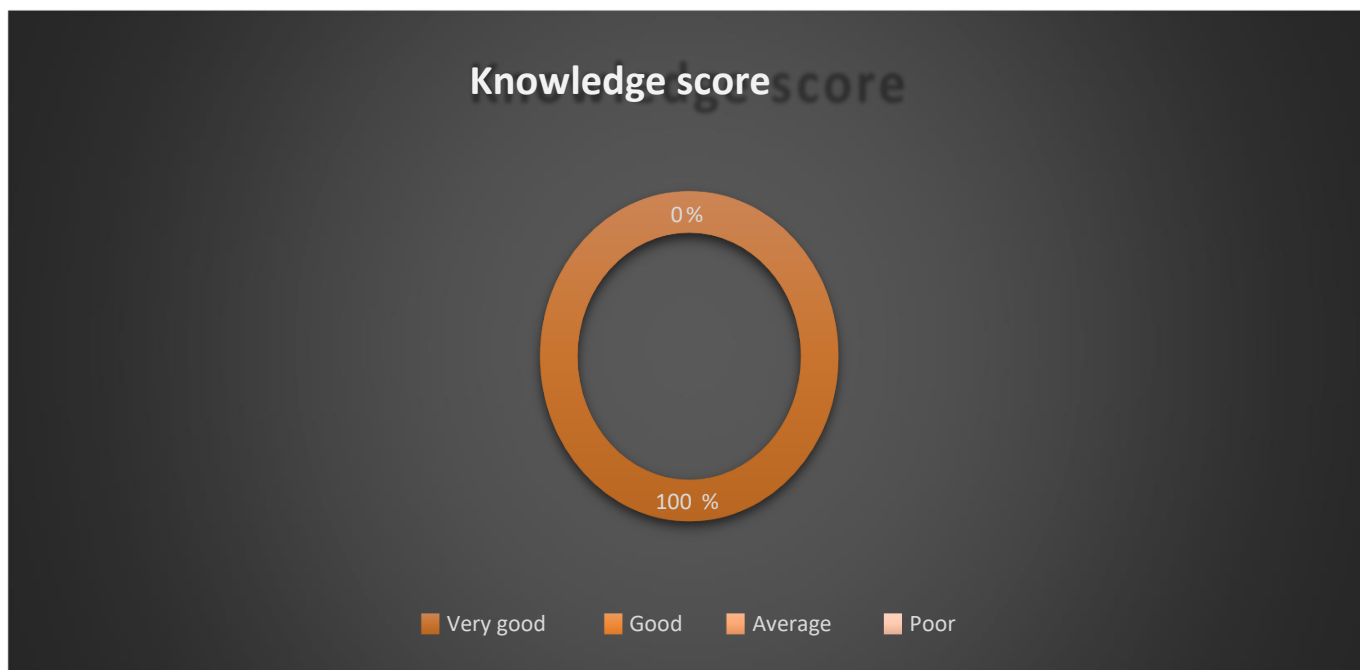


Figure 10: Doughnut Diagram illustrating Percentage distribution by the category of Knowledge score of Nurses in Post-test.

PART-2: MEAN, MEDIAN, MODE, STANDARD DEVIATION AND RANGE OF KNOWLEDGE SCORE OBTAINED BY NURSES REGARDING VENTILATOR ASSOCIATED PNEUMONIA IN POST-TEST

It describes that the Mean, Median, Mode, Standard deviation and range of knowledge score obtained by Nurses regarding Ventilator Associated Pneumonia in post-test.

Table 3: Mean, Median, Mode, Standard deviation and range of knowledge score obtained by Nurses regarding Ventilator Associated Pneumonia in post-test.

N=30

VARIABLE	POSSIBLE RANGE OF SCORES	RANGE OF OBTAINED SCORES	MEAN	MEDIAN	MODE	STANDARD DEVIATION
Knowledge	0-30	23-29	26.9	27.2	28.4	1.64

Data presented in Table 3 Shows that Mean knowledge score of Nurses were 26.9, the Median was 27.2 and the Mode was 28.4 with Standard deviation of 1.64.

PART-2: MEAN, MEDIAN, MODE, STANDARD DEVIATION AND RANGE OF KNOWLEDGE SCORE OBTAINED BY NURSES REGARDING VENTILATOR ASSOCIATED PNEUMONIA IN POST-TEST .

It describes the Mean, Median, Mode, Standard deviation and range of knowledge score obtained by Nurses regarding Ventilator Associated Pneumonia in post-test.

TABLE 4: Mean, Median, Mode, Standard deviation and range of knowledge score obtained by Nurses regarding Ventilator Associated Pneumonia in post-test.

N=30

VARIABLE	POSSIBLE RANGE OF SCORES	RANGE OF OBTAINED SCORES	MEAN	MEDIAN	MODE	STANDARD DEVIATION
Knowledge	0-30	23-29	26.9	27.2	28.4	1.64

Data presented in Table 5 shows that Mean knowledge score of Nurses were 26.9, the Median was 27.2 and the Mode was 28.4 with Standard deviation of 1.64.

SECTION 4: FINDINGS RELATED TO COMPARISON BETWEEN KNOWLEDGE SCORES OF NURSES IN THE PRE-TEST AND POST-TEST

This section describes the Findings related to comparison between knowledge scores of Nurses in Pre-test and Post-test regarding Ventilator Associated Pneumonia. Coefficient of Comparison was computed using Karl Pearson's Correlation Coefficient.

Table 5: Comparison between knowledge scores of Nurses in Pre-test and Post-test

Variables	Mean	Standard Deviation	Range	't' Value
Pre-test	17.7	3.99	10-25	-13.2
Post-test	26.7	1.24	23-29	-13.2

Non –Significant

Data presented in Table 5 shows that the comparison of correlation 'r' value is -13.2 ,which shows that there is increase in knowledge of nurses in post-test than pre-test regarding Ventilator Associated Pneumonia.

N=30

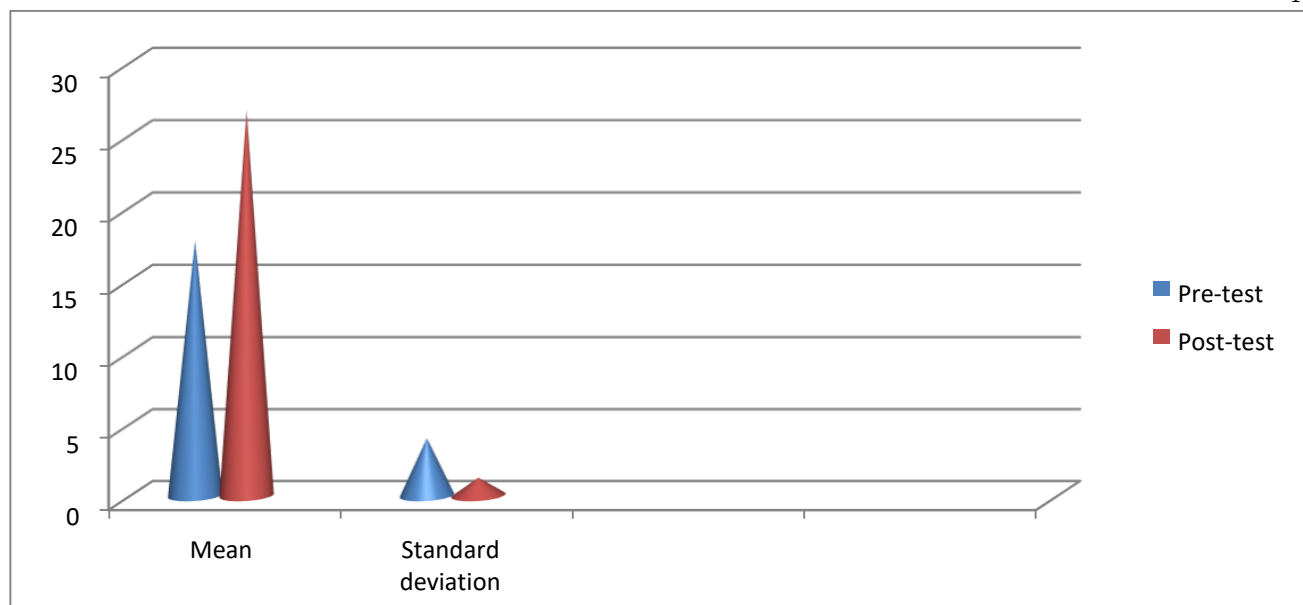


Figure 11: Cone Graph represents the comparison of Mean and Standard deviation in between Pre-test and Post-test.

DISCUSSION

Ventilator associated pneumonia (VAP) occurs when bacteria colonize the aerodigestive tract and then enter the lungs through the ventilator circuit or endotracheal tube. This study aims to assess the effectiveness of planned teaching programme on knowledge of staff nurses working in ICU regarding the prevention of ventilator associated pneumonia in the selected, hospitals of New Delhi.

A total of 30 samples, 76.66% staff nurses to the age group of 25 to 30. Majority have gained previous knowledge from hospital as well as the mean knowledge score and standard deviation for pre-test was 17.7 and 3.99 post test score was 26.7 and 1.24 median for pre-test was 17 and post-test was 27.

The following objectives and hypothesis have been in relation to the study's finding:

Demographic characteristics of nurses

The finding in this study indicated that there is maximum sample were of the age group 25-30 years, majority of the samples were females whereas Christian religion. And the majority of the samples were of mostly B.sc nursing having experience less than 5 years.

Structured knowledge questionnaire on VAP bundle to prevent VAP.

The finding in this study indicated that highest score in the area of knowledge about VAP is 10 out of total of 30 with mean percentage 33.3% and the lowest score of 3 out of total 30 sample with the percentage of 10%. In the area of knowledge of staff nurses working in ICU regarding prevention of VAP shows that these areas falls under lower mean percentage which is inadequate (that is greater than or equal to 23). Therefore a planned teaching programme was arranged for the samples.

II. ACKNOWLEDGMENT

We are highly thankful to all the staff nurses who cooperated and participated in this study. We are extremely obliged to all the expert Dr. Juhi dhar (senior consultant) internal medicine, BHMRC for motivation and support through the study. We take this opportunity to express our sincere gratitude towards the entire faculty of nursing of BHMRC as well as the administrative staff support and assistance throughout the study period.

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