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Knowledge levels on care of patient with mechanical ventilation among 3rd year BSC nursing students

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Abstract

The vital role of mechanical ventilation is to support patients whose respiratory systems have failed until the adequate function returns. Mechanical Ventilation can relieve respiratory distress in patients for whom the work of breathing has become intolerable. In addition, prevention or reversal of lung collapse and reversal of respiratory muscle fatigue can be managed by mechanical ventilation.

Objectives

- 1) To assess the knowledge levels on Care of patient with Mechanical Ventilation among 3rd year B.Sc. Nursing students.
- 2) To find out the association between levels of knowledge regarding Care of patient with Mechanical Ventilation among 3rd year B.Sc. Nursing students with their selected demographic variables.

Methods: A descriptive Cross-sectional research design by simple random sampling technique was used for selecting 50 study samples. The validity and reliability of the tool was established. Closed ended questionnaire was used to collect the data from the study samples. The collected data was transferred to the excel spread sheet, windows version 2010. The transferred data was analyzed by using descriptive & inferential statistics.

Results: The findings of the results reveals that percentage wise distribution of 3rd year B.Sc. Nursing students according to age group reveals that the highest percentage of students 44 (88%) were between 19-23 years, 6 (12%) were between 24-29 years. The percentage wise distribution of 3rd year B.Sc. Nursing students according to the gender group reveals that the highest percentage of students 42 (84%) were Females and 8 (16%) were males. The studies mean score was 18.20 with the standard deviation of 3.59.

Conclusion: The study concludes that, third year B.Sc Nursing students have good knowledge on Care of patient with Mechanical Ventilation.

Keywords: Knowledge, care of patient, mechanical ventilation, nursing students

Introduction

Mechanical Ventilation can also relieve respiratory distress in patients for whom the work of breathing has become intolerable ^[1]. In addition, prevention or reversal of atelectasis and reversal of respiratory muscle fatigue can be accomplished by mechanical ventilation ^[2]. Even in patients who experience compromised myocardial function when the work of breathing becomes excessive ^[3].

Mechanical ventilation has been used for decades to support the respiratory function of patients with various degrees of respiratory failure ^[4]. Patients who have weak or absent spontaneous respirations usually require mechanical ventilation support to assist in ventilation and oxygenation ^[5]. The Mechanical ventilator is integral life support equipment in the critical care and it is important for the practitioner to know the basic concepts and applications of mechanical ventilation.

Need for the study

A study conducted on needs, problem & holistic nursing care of patients on mechanical ventilation says that nursing a patient on mechanical ventilation a challenges to the nurses ^[6]. She needs to have technical & scientific knowledge and above all a high standard of empathy & concern for suffering individual. A client on ventilator always remains under severe physiological and psychological stress. Physiological stress leads to condition like inflammation and infections of the airways, pneumothorax, emphysema, decrease in blood pressure and cardiac function ^[8], etc.

Operational Definitions

Knowledge: It refers to the, the level of knowledge identified by the 3rd year BSc nursing students on care of patient with mechanical ventilation.

Care of patient with Mechanical ventilation: It refers to the, the theoretical and practical information known by the student nurses on how to care the patient on Mechanical ventilation.

Nursing students: It refers to, the students who are studying in 3rd year BSc Nursing at Rama College of nursing, Kanpur, Uttar Pradesh, India.

Hypothesis

H₁:- There is a significance of knowledge on Care of patient with mechanical ventilation.

H₂:- There is a significant association between the levels of knowledge regarding care of patient with mechanical ventilation among 3rd year BSc Nursing students with their selected demographic variables.

Assumption

The study assumes that, all the 3rd year B.Sc. Nursing students will have some level of knowledge regarding care of patient with mechanical ventilation.

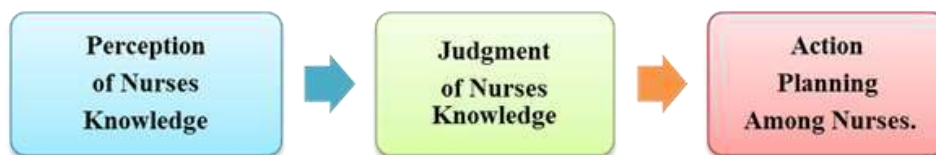


Fig 1: Conceptual Frame work on Nurses knowledge on care of patient with Mechanical Ventilation.

Methodology

Research methodology is a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. Descriptive cross sectional approach was used in this study. The present study was conducted at Rama College of Nursing, Rama University, Kanpur, and Uttar Pradesh, India.

The accessible population was 3rd year B.Sc. Nursing Students at Rama College of nursing, Kanpur, Uttar Pradesh, India. Simple random sampling technique was used to select the study samples for the study. Sample size was 50 3rd year B.Sc. Nursing students and who fulfill the inclusion criteria of the study.

Sampling criteria

Inclusion criteria

The study includes students in Rama College of Nursing, Rama University, Kanpur, and Uttar Pradesh, India who are: Studying 3rd year B.sc nursing. Students who are willing to participate in the study are included.

Exclusion criteria

The study excludes the students who are: Not willing to participate in the study. Not available at the time of data collection.

Selection & development of the tool

A structured questionnaire was prepared to assess the

Delimitations

The study is limited to Rama college of nursing, 3rd year B.Sc. Nursing students, 4 weeks of data collection, 50 study samples only.

Conceptual framework

Imogene Martina King is one of the pioneers nursing theorists. The Theory of Goal Attainment was developed in the year of 1960s [10]. Her work is being taught to thousands of nursing students from all over the world and is implemented in a variety of service settings as well [10]. The Imogen king goal attainment theory for the study deals as follows:-

Perception: It is an each person's representation of reality. It is the Assessment of Nursing students' knowledge on care of patient with Mechanical Ventilation.

Judgment: It is the ability to form opinions or to make sensible decisions. It is the Knowing the Knowledge of Nursing students on care of patient with Mechanical ventilation.

Action: It is defined as a sequence of behaviors involving mental & physical action. It's the Planning for increasing the knowledge of nursing students on care of patient with Mechanical Ventilation [11].

knowledge on care of patient with Mechanical Ventilation among 3rd year B.Sc. nursing students. The tools were selected based on the research problem, guidance of experts in the field of medical surgical nursing. The final tool was modified with the guidance and suggestions of nursing experts and guide accordingly.

Description of the tool

The tool was prepared by the investigator after an extensive study of the related literature and with the guidance of experts. The structured questionnaire was used to assess the knowledge regarding Mechanical ventilation among 3rd year BSc Nursing students. The tool consists of two sections.

Section-A: Demographic Data of 3rd year BSc nursing students.

Demographical data consists of Age, Gender, and Previous Knowledge about Mechanical Ventilation, Source of Knowledge.

Section-B: Structure Questionnaire on care of patient with Mechanical ventilation.

Structured questionnaire which consists of 25 questions from various aspects related care of patient with Mechanical ventilation. Each question had 4 options for which instructions were clearly written for 3rd year B.Sc. nursing students to choose the correct option.

Scoring of The Item

The structured questionnaire on care of patient with

Mechanical ventilation prepared with 25 questions. Each question had 4 options with 1 accurate answer. The score for correct response to each item was “one” and incorrect response was “zero”. Thus for 25 questions maximum obtainable score was “25” and minimum score was “0”. To find out the knowledge score respondents were categorized into three groups.

Table 1: Grading of knowledge scores

| S. No | Knowledge range score with percentage | Categories |
|-------|---------------------------------------|-------------------|
| 1. | Adequate knowledge | 17-25 (68 – 100%) |
| 2. | Moderate knowledge | 9-16 (36 – 64%) |
| 3. | Inadequate knowledge | 1-8 (4- 32%) |

Validity

The developed research tool of the study was submitted to the experts for the content validity. Modifications were made on the basis of recommendations and suggestion from the experts. After collecting content validity, the final tool was reframed. Tool was found to be valid & suitable for 3rd year B.Sc. nursing students to know the knowledge regarding care of patients on Mechanical Ventilation.

Reliability

The simple random sampling technique was used for to select six 3rd year B.Sc. Nursing students in order to check the reliability of the tool. The split half method was used to find out the reliability of the instrument. Scores of the 1st half numbers were taken as ‘X’ and score of the 2nd half numbers were taken as ‘Y’. The reliability was established by Karl Pearson’s Co-efficient of correlation formula represented by the notation ‘r’. The reliability of the knowledge test was found to be $r=0.89$. Since the computed correlation of knowledge scores was high, the tool was found to be reliable to conduct the study.

Pilot study

The pilot study was conducted among nursing students. Formal permission was obtained from the principal, Rama college of College of Nursing, Rama University, Kanpur, and Uttar Pradesh, India. The study samples were selected by probability simple random sampling technique and those who are willing to participate in this study. 3rd year B.Sc. nursing students those who are fulfilling the inclusion criteria were chosen as sample to the study. The investigator selected 6 study subjects. The knowledge about the investigator and information regarding nature of the study was explained. Knowledge test was done on 5 August 2018 from the questionnaire on care of patient with Mechanical ventilation. The collected data entered in the excel spread sheet windows version 2010. The data analysis was completed with the help of descriptive and inferential statistics on the basis of objectives of the study.

Data Collection Procedure

The data collection was done in Rama college of Nursing, Rama University, Kanpur, Uttar Pradesh, India. Formal approval was obtained from the Principal of Rama College of Nursing, Rama University, Kanpur, Uttar Pradesh, India. The data collection was done for a month and the data were collected from the 3rd year B.Sc. Nursing students by using structured questionnaire method. The samples were selected by simple random sampling technique. The investigator selected the sample from the Rama College of Nursing,

Kanpur, and Uttar Pradesh, India. The researcher conducted the study on knowledge on care of patient with Mechanical ventilation among 3rd year B.Sc. nursing students. The collected research data was checked for completeness and entered in the excel spread sheet windows version 2010. The data analysis was completed with the help of descriptive and inferential statistics on the basis of objectives of the study.

Plan for Data Analysis

Data analysis is the process of systematic organization & synthesis of the data after the hypothesis has been tested or the research problem has been solved [12]. After coding the collected data, it was transferred to the excel spread sheet windows version 2010 [13]. The obtained data was analyzed in terms of the objectives of the study by using descriptive and inferential statistics [14]. The various used statistical methods are:

Descriptive statistics

Frequency and percentage was used for [14]. To explain demographic data of 3rd year BSc Nursing students. Mean and standard deviation used to assess the knowledge level of 3rd year BSc nursing students regarding care of patient with Mechanical ventilation.

Inferential statistics

Chi-square test was used [15]. To find out the association between knowledge score on care of patient with Mechanical ventilation with their demographic variables.

Statistical Analysis of Data

The collected research data entered in the excel spread sheet windows version 2010. Frequency & percentage were used for the analysis of demographic characteristics [16]. Mean and Standard deviation was used to assess the knowledge levels among 3rd year B.Sc. Nursing students regarding care of patient with mechanical ventilation. Chi-square test was [17]. Used to find out the association between demographic variables with their knowledge score on care of patient with mechanical ventilation.

Results

Analysis is a process of organizing and synthesizing data in such a way that research question can be answered and hypothesis is tested [18].

Description of statistical methods used in the study

Frequency & Percentage: Frequency and percentage distribution of Socio demographic variables on 3rd year B.Sc. nursing students.

- Knowledge levels of 3rd Year B.Sc. Nursing Students regarding care of patient with Mechanical Ventilation.

Mean & Standard Deviation

- Knowledge levels of 3rd Year B.Sc. nursing Students regarding care of patient with Mechanical Ventilation in terms of Mean and standard deviation.

Chi-square test

- Association of 3rd Year B.Sc. Nursing Students Knowledge levels regarding care of patient with Mechanical Ventilation with their selected socio demographic variables.

Data Interpretation, Organization of Data: Tables, Figures and Graphs

The data collected from the samples of the study was classified, organized and analyzed ^[19] under the following sections:

Section A: Distribution of socio demographic variables on 3rd year BSc nursing students in terms of Frequency & Percentage.

Section B: Assessment on knowledge levels of 3rd year BSc nursing students regarding care of patient with Mechanical Ventilation in terms of Frequency & Percentage.

Section C: Assessment on knowledge levels of 3rd year BSc nursing students regarding care of patient with Mechanical Ventilation in terms of Mean & Standard Deviation.

Section D: Association of 3rd year B.Sc. nursing student's knowledge levels regarding care of patient with Mechanical Ventilation with their selected Socio Demographic Variables.

Section A

Frequency and percentage distribution of 3rd year Bsc nursing students in terms of frequency and percentage. Age

The Frequency and percentage wise distribution of 3rd year BSc nursing students according to age group reveals, the highest percentage of students 44 (88%) were between 19-23 years, 6 (12%) were between 23-29 years. Whereas no one above 30 years of age.

Gender

The frequency and percentage wise distribution of 3rd year BSc Nursing students according to the gender group reveals

that, the highest percentage of students 42(84%) were Females and 8(16%) were males.

Previous knowledge

The frequency and percentage wise distribution of 3rd year BSc Nursing students according to Previous Knowledge, which reveals that number of students with no previous knowledge about care of patient with mechanical ventilation were more i.e. 31 (62%), whereas with previous knowledge regarding mechanical ventilation were less i.e. 19 (38%).

Source of knowledge

The frequency and percentage wise distribution of 3rd year BSc Nursing students according to the source of knowledge shows that, 31 (62%) students got the knowledge from textbooks, 6 (12%) from class teaching, 8 (16%) from the seminars or workshops, 5 (10%) from the health care professionals and none from the Clinical Teaching.

Section B

Assessment on knowledge levels of 3rd year BSc Nursing students regarding care of patient with mechanical ventilation in terms of frequency & percentage (N=50)

Table 2: 3rd year BSc nursing students' knowledge levels on care of patient with Mechanical Ventilation

| Knowledge | Categories | Frequency | Percentage |
|------------|------------|-----------|------------|
| Inadequate | 1-8. | 2 | 4% |
| Moderate | 9-16. | 16 | 32% |
| Adequate | 17-25. | 32 | 64% |

The table explains on frequency and percentage distribution of knowledge levels on care of patient with Mechanical ventilation, 2 (4%) of subjects were having inadequate knowledge, 16 (32%) were having moderate knowledge and remaining 32 (64%) subjects were having adequate knowledge.

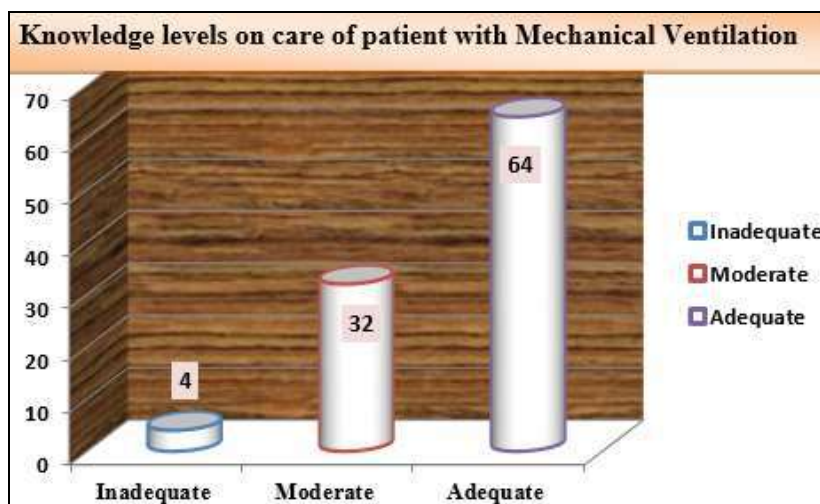


Fig 2: Knowledge levels of 3rd year BSc nursing students on care of patient with Mechanical Ventilation.

Section C

Assessment on knowledge levels of 3rd year BSc nursing students regarding care of patient with Mechanical ventilation in terms of mean & standard deviation.

Table 3: 3rd year BSc nursing students Knowledge levels on care of patient with Mechanical ventilation in terms of Mean & S.D. (N=50)

| Test | Mean | S.D. |
|------------------|-------|------|
| Knowledge levels | 18.20 | 3.59 |

The average knowledge score on care of patient with Mechanical ventilation was identified by Mean & Standard Deviation. The average Mean score was 18.20 with standard deviation of 3.59.

Section-E

Association of 3rd year BSc Nursing Students Knowledge Score Regarding care of patient with Mechanical Ventilation with Their Selected Socio Demographic Variables.

The above Chi-Square test association explains on knowledge score on 3rd year B.Sc. nursing students regarding care of patient with Mechanical Ventilation with their socio demographic variables as Age and previous knowledge categories shows significant association with the level of knowledge at 0.05 level of significance. The remaining categories explain non-significant association with the level of knowledge levels at 0.05 level of significance. Hence we accept the formulated hypothesis is significant at 0.05 level of significance.

Discussion

Major Findings of the Study and Discussion

The analysis of the socio demographic data of the study samples given an idea about the general characteristics of the nursing students [20]. The following are the major findings of the study.

Section –A: Distribution on Socio demographic variables of 3rd year BSc Nursing students

According to age in the study most of them 88% were of age between 19-23 years, 6% were of age between 23-29 years and no one above 30 years of age. In the relation to age, 84% BSc nursing students were females and 16% males. In category of previous knowledge, 62% students answered “no” and 38% say “yes”. According to source of knowledge of 2nd year B.Sc. Nursing students, 62% students got the knowledge from textbooks, 12% from class teaching, 16% from the seminars or workshops and 10% from the health care professionals.

Section-B

Assessment on Knowledge levels of 3rd Year B.Sc. Nursing Students regarding care of patient with Mechanical Ventilation.

The knowledge levels on as care of patient with Mechanical ventilation, 2(4%) of subjects were having inadequate knowledge, 16 (32%) were having moderate knowledge and remaining 32 (64%) subjects were having adequate knowledge.

Section-C

Assessment on Knowledge levels on 3rd Year BSc Nursing Students Regarding care of patient with Mechanical Ventilation in term of Mean & Standard deviation.

The assessment on the knowledge score of care of patient with Mechanical ventilation was analyzed by the Mean & Standard Deviation. The knowledge means score was 18.20 with standard deviation of 3.59.

Section-D

Association of Knowledge of 3rd Year BSc Nursing Students on care of patient with Mechanical Ventilation with Demographic Variables.

The Chi-Square association explains knowledge score of 3rd year BSc nursing students regarding care of patient with Mechanical Ventilation with their socio demographic variables as Age and previous knowledge categories shows significant association with the level of knowledge at 0.05 level of significance. The remaining categories explain non-significant association with the level of knowledge at 0.05 level of significance. Hence we accept the formulated hypothesis is significant at 0.05 level of significance.

Nursing Education

The findings of the present study can be a foundation for conducting the study on large section of population.²¹ the study can be a baseline for future studies to build up and motivate to conduct further studies [22]. The implication of the study can be used as motivation for 3rd year BSc Nursing students to conduct the research in future areas regarding knowledge on care of patient with Mechanical Ventilation [23].

Recommendations

On the basis of findings, it is recommended that: The similar study may be replicated on large scale. The similar study can be conducted in hospital area. A comparative study can be conducted between 3rd year B.Sc. Nursing students and nursing staff in the hospital.

Summary and Conclusion

The findings are summarized as follows

Most of the percentage of students was under the age group between-19-23 (88%). Most of the students were female 42 (84%). The overall mean knowledge score was 18.20% with standard deviation of 3.59 of the total score reveals that, the students have good knowledge regarding care of patient with mechanical ventilation among 3rd year B.Sc. Nursing students.

Discussion of the Study

The present study compared with the similar type of study, the brief review of the study explained here as compare with the present study results. A similar study conducted by Serdar Saritas, Ayten Kaya, Nihal Dolanbay on Knowledge and Practices of Intensive Care Nurses on Mechanical Ventilation in the year of 2019 at Malatya, Turkey. Aim: This study was conducted to determine the use of the mechanical ventilator by the intensive care nurses and their knowledge, attitude, and behaviour about the care practices of the mechanically ventilated patients. Method: This descriptive study was conducted with the nurses working in intensive care units of a university hospital. The population consisted of the intensive care nurses (n=200). In the study, the sample selection method was not used and 108 nurses who agreed to participate in the study were included. Material: The data collected with the "Questionnaire" prepared by the researchers based on the literature were assessed using percentage, mean and correlation analyses in SPSS 20.0 program.

Results

In the study, 76% of the nurses were females and 30% had the intensive care certificate. 24% answered correctly the criteria of starting the mechanical ventilation and 86% answered the ventilation modes correctly. 60% and 71% could not answer the reasons of the mechanical ventilator's

high and low pressures, respectively. It was found that almost all of the nurses (94%) made the endotracheal tube care, 85% controlled the cuff pressure routinely, and 63% made this control by touching with hands. 57% used physiological saline solution before aspiration. 58% defined correctly the anxiety symptoms. Conclusion: It was determined that the nurses, following up the mechanically ventilated patients in the intensive care units, did not have enough knowledge about mechanical ventilation practices [24].

The present study results: The findings of the results reveals that percentage wise distribution of 3rd year B.Sc. Nursing students according to age group reveals that the highest percentage of students 44 (88%) were between 19-23 years, 6 (12%) were between 24-29 years. The percentage wise distribution of 3rd year B.Sc. Nursing students according to gender group reveals that the highest percentage of students 42 (84%) were Females and 8 (16%) were males. The studies mean score was 18.20 with the standard deviation of 3.59.

Conclusion

The study concludes that, 3rd year B.Sc Nursing students have good knowledge on care of patient with Mechanical Ventilation with Mean was 18.20 with Standard Deviation was 3.59.

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