

A Descriptive Study to Assess the Knowledge and Practice Regarding Ventilator Associated Pneumonia (VAP) Critical Care Bundle among Students of Selected Nursing Colleges of Distt. Mohali, Punjab

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ABSTRACT

INTRODUCTION: Mechanical ventilation has become the most commonly used mode of life support in medicine today. Mechanical ventilation is life saving, but like other interventions, it is not without complications. Physiologic complications associated with mechanical ventilation include ventilator induced lung injury, cardiovascular compromise gastrointestinal disturbances, pneumothorax and the most importantly ventilator associated pneumonia. Patients in the intensive care unit (ICU) are at risk for dying not only from their critical illness but also from secondary process such as nosocomial infection. Hospital Acquired Pneumonia is the second most common nosocomial infection in critically ill patient's affecting 27% of all critically ill patients. Ventilator associated pneumonia (VAP) is a form of nosocomial pneumonia that occurs in patients receiving mechanical ventilation within 48 hours of intubation.

AIM: The aim of the study is to assess the knowledge and practice regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students.

MATERIAL AND METHODS: The conceptual framework of the study was based on Health Belief Model. A quantitative research approach with descriptive design was adopted for the study. Non probability convenience sampling technique was used and 150 samples from selected colleges were selected. The data was collected by using Sociodemographic variables, self structured questionnaire regarding ventilator and checklist was prepared.

KEYWORDS: Ventilator Associated Pneumonia, Nursing students, Practice

RESULTS: The study finding were as (75%) respondents has excellent knowledge, 22% had good knowledge, 3% had average and no one had poor knowledge regarding Ventilator Associative Pneumonia (VAP). Practice score of study shows that 73% of study subjects had Good practice, 25% had excellent practice, 2% had average practice and no one had poor practice regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students. It shows that there is significant association between knowledge score and practice score with

gender, there is no significant association between the level of knowledge and practice score regarding VAP with other demographic variables

CONCLUSION: The present study was undertaken to evaluate knowledge and practice regarding Ventilator Associated Pneumonia (VAP) critical care bundle among nursing students. The study revealed that nursing students had excellent knowledge and good practice regarding Ventilator Associated Pneumonia (VAP) critical care bundle.

How to cite this paper: Anuradha | Dr. Narinder Kaur Walia | Mrs. Manu Nagra | Mrs. Manpreet Kaur "A Descriptive Study to Assess the Knowledge and Practice Regarding Ventilator Associated Pneumonia (VAP) Critical Care Bundle among Students of Selected Nursing Colleges of Distt. Mohali, Punjab" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-6 | Issue-1, December 2021, pp.1239-1243, URL: www.ijtsrd.com/papers/ijtsrd48028.pdf



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INTRODUCTION & BACKGROUND OF THE STUDY

The respiratory system allow for the inhalation of gases such as oxygen in the air which can then be transport by the blood around the body to supply tissue and cell, and the exhalation of waste gases such as carbon dioxide into the air. The goals of respiration are to provide oxygen to tissues and remove carbon dioxide. The physiology of respiration involves the following three processes.1) Ventilation, or the movement of air between and the alveoli.2) Diffusion of oxygen and carbon dioxide between the pulmonary and capillaries and the alveoli.3) Transport of oxygen and carbon dioxide in the blood to and from the cells. During ventilation, the movement of air into lungs is known as inhalation and movement of air out of the lungs is known as exhalation.¹ Mechanical ventilation is indicated when the patient's spontaneous ventilation is inadequate to maintain life. It is indicated for physiologic and clinical reasons. Physiological objectives include supporting cardio pulmonary gas exchange, increasing lung volume and reducing work of breathing. Clinical objectives include reversing hypoxemia and acute respiratory acidosis, relieving respiratory distress, preventing or reversing atelectasis and respiratory muscle fatigue, permitting sedation, reducing intra cranial pressure and stabilizing the chest wall.²

Mechanical ventilation is also required to control the patient's respiration during surgery or during treatment of severe head injury, to oxygenate the blood when the patient's ventilator efforts are inadequate. This involve a machine called mechanical ventilator. A mechanical ventilator is a breathing device that can maintain ventilation and oxygen delivery for a prolonged period of time.³

Mechanical ventilation has become the most commonly used mode of life support in medicine today. Mechanical ventilation is life saving, but like other interventions, it is not without complications. Physiologic complications associated with mechanical ventilation include ventilator induced lung injury, cardiovascular compromise gastrointestinal disturbances, pneumothorax and the most importantly ventilator associated pneumonia. Pneumonia is the second most common nosocomial infection in the world is a leading cause of death due to hospital acquired infections. Patients in the intensive care unit (ICU) are at risk for dying not only from their critical illness but also from secondary process such as nosocomial infection. Hospital Acquired Pneumonia is the second most common nosocomial infection in critically ill patient's affecting 27% of all critically ill patients. Ventilator associated pneumonia (VAP) is a

form of nosocomial pneumonia that occurs in patients receiving mechanical ventilation within 48 hours of intubation.⁴

Risk factors for Ventilator associated pneumonia are multiple and are divided in to that are modifiable and non modifiable. Modifiable factors include the supine position, stomach distension, improper suctioning, pooling of the secretion, frequent patient transfers, instillation of normal saline, understaffing, non-conformance to hand washing protocol, indiscriminate use of antibiotics, lack of training in (VAP) prevention and low pressure of the endotracheal tube (ETT) cuff.

Non-modifiable factors include male gender, age over 60 years, acute respiratory distress syndrome, multiple organ failure, coma, chronic obstructive pulmonary disease, tracheostomy, re-intubation, neurosurgery and cranial trauma. The onset of (VAP) can be divided in to two types:-early onset and late onset. Early onset (VAP) occur within 48 hours to 96 hours after intubation and is associated with antibiotic- susceptible organisms. Late onset (VAP) occur more than 96 hours after intubation and is associated with antibiotic resistant bacteria.⁵

The pathogenesis of (VAP) involves the colonization of bacteria at the aero digestive tract and aspiration of secretions from upper respiratory tracts into the lower airways. In a healthy person, the body's own flora can help to prevent the colonization of bacteria and virulent pathogens in the oropharynx. The presence of an endotracheal tube allows for the direct entry of bacteria into the lower respiratory tract, preventing the normal host defense which include filtration and humidification of air in the upper airway, epiglottis and cough reflexes, and ciliary transport action. It has been found that the colonization of bacteria occurs as early as 12 hours after intubation, beginning from the oropharynx, then in the stomach and finally in the endotracheal tube. Aspiration of colonized intestinal and oropharynx secretions is also a significant source of infective pathogens in the lungs.⁶

Preventing Ventilator associated pneumonia is one of the important safety issues in critically ill patients receiving mechanical ventilation. The American Association of Critical- Care Nurses (AACN) recommended steps for reducing the incidence of (VAP) and these steps are based on the best-practice guidelines for patients receiving mechanical ventilation called the "ventilator bundle". Implementing ventilator bundle has been strongly advocated in ventilated patients, who are at risk for developing ventilator 4 associated pneumonia. The ventilator bundle is being promoted to prevent

adverse events in ventilated patients including ventilator-associated pneumonia (VAP).⁷

The Institute for Healthcare Improvement (IHI) advocated the use of bundles, defined as „a small, straight forward set of practices – generally three to five – that, when performed collectively and reliably, have been proven to improve patient outcomes“ [8]. The IHI developed the „Ventilator Bundle“ consisting of four evidence based practices to improve the outcomes of patients requiring mechanical ventilation and provided the methodology for bundle implementation and measurement of compliance. The Ventilator Bundle components are as follows:

1. elevation of the head of the bed to 30–45 degrees
2. daily „sedation vacation“ and daily assessment of readiness to extubate
3. peptic ulcer disease prophylaxis
4. deep venous thrombosis (DVT) prophylaxis
5. chlorhexidine antiseptic,
6. subglottic secretion drainage.

When hospital Institute for Health Improvement (IHI) Ventilator Bundle saw significant reductions in VAP rates, it was promoted as a tool for VAP prevention.⁸

Ventilator associated pneumonia is defined as health care associated pneumonia in a patient who has been mechanically ventilated (by endotracheal tube or tracheotomy) for at least 48 hours at the time of diagnosis. The radiograph shows new or progressive and persistent infiltrates. Other sign and symptoms include temperature higher than 100.4 fahrenheit, leukocytosis, new onset of purulent sputum or cough and worsening gas exchange. VAP is the third leading health care associated infection.⁹ Intubation and mechanical ventilation both increase the risk of bacterial pulmonary infection because the invasive endotracheal tube allows direct entry of bacteria into the lower respiratory tract since the tube is located in the trachea. Bacterial colonization in the respiratory

RESULTS:

Table- 1 Frequency and percentage distribution of socio-demographic variables.

N=150

Demographic Variables		(f)	(%)
Academic years	B.Sc 3 rd year	92	61
	B.Sc 4 th year	58	39
Gender	Male	15	10
	Female	135	90
Area of Experience	Neurosurgery ward	30	20
	Critical care unit	7	5
	Intensive care unit	113	75
Source of information	Curriculum	9	6
Regarding VAP	Electronic media	87	58
	Clinical area	54	36

tract is further facilitated by the absence of the cough 5 reflex and excessive mucus secretion in the mechanically ventilated patient.¹⁰

OBJECTIVES OF STUDY

1. To assess the knowledge regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students.
2. To assess the practice regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students.

MATERIALS AND METHODS

Research approach and design: The quantitative research approach and descriptive design was used.

Sample Size and Sample Technique: The sample technique was selected by non-probability convenient sampling technique and sample size was 150.

Selection and development of research tool: Part-1: Socio demographic data: This part consider 4 items related the socio demographic background of the study.

Part-11: Self structured questionnaire: This part consider 30 items with 4 options. The each category the maximum score is 1 and minimum score is 0.

Part-111: Checklist: This part consider 20 items, the each item maximum score is 1 and minimum score is 0.

ETHICAL CONSIDERATIONS

Prior written permission was taken from the Principal of Saraswati Institute of Nursing college kurali and Principal of Mata Sahib Kaur college of Nursing Mohali, Punjab to collect the data. Self introduction and introduction of the nature of study were explained to the nursing students. Assurance was given to the study participants regarding the confidentiality of data collected and it was truly used for research work of study.

Table –1: shows frequency, percentage distribution of socio demographic characteristics of subjects with regards to Academic year, Gender, Area of exposure, Source of information.

OBJECTIVE 1: To assess the knowledge regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students.

Table -2 Frequency and percentage distribution according to knowledge score regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students.

N=150

Knowledge score	Criterion measure	f	%
Excellent	24-30	113	75
Good	16-23	32	22
Average	8-15	5	3
Below average	1-7	0	0

Maximum score =30

Minimum score = 0

Table No- 2: depicts the percentage distribution of the knowledge score according to the criterion measure and it reveals that majority of the students (24-30)75% had excellent knowledge, where as (16-23)22% had good knowledge followed by (8-15)3% having average knowledge and no one have poor knowledge regarding ventilator associated pneumonia(VAP).

Thus, it is inferred that majority of the study subjects excellent knowledge regarding ventilator associated pneumonia (VAP).

OBJECTIVE 2: To assess the practice regarding ventilator associated pneumonia (VAP) critical care bundle among nursing students.

Table- 3 Frequency and percentage distribution according to Practice score regarding ventilator associated pneumonia (VAP) critical care bundle among nursing student.

N=150

Practice score	criterion measures	f	%
Excellent	16-20	37	25
Good	11-15	110	73
Average	6-10	3	2
Below average	0-5	0	0

Maximum score =20

Minimum score = 0

Table No -3: depicts the percentage distribution of the practice score according to the criterion measure and it reveals that majority of the students had (11-15)73% of study subjects had Good practice, (15-20)25% had excellent practice, (6-10)2% had average practice and no one had below average practice regarding ventilator associated pneumonia(VAP).

Thus, it is inferred that majority of the study subjects had good practice regarding ventilator associated pneumonia(VAP) critical care bundle among nursing students.

DISCUSSION

The finding of the present study revealed majority 75% of study subjects had excellent knowledge, 22% had good knowledge, 3% had average knowledge and no one had poor knowledge regarding ventilator associated pneumonia (VAP) and majority 73% of study subjects had Good practice, 25% had excellent practice, 2% had average practice and no one had poor practice regarding ventilator associated pneumonia (VAP).

Kalyan G, Bibi R, Kaur R, et al. (2020) conducted a similar study on Knowledge and Practices of

Intensive Care Unit Nurses Related to Prevention of Ventilator Associated Pneumonia, 108 ICU staff nurses result of study 82 (75.93%) had average, 24 (22.22%) had good and only 2 (1.85%) of the ICU nurses had poor knowledge. Assessment of the practices revealed that 68 (94.44%) nurses had average and only 4 (5.55%) nurses had good practice. There was no association between the knowledge and practices of ICU nurses related to prevention of VAP. ($\chi^2 = 0.14, p = 0.710$).

Nahla Shaaban Ali,(2013) Another study “Critical care Nurses” Knowledge regarding Ventilator

Associated Pneumonia (VAP) Bundle at Cairo University Hospitals in Cairo, Egypt was conducted in which result showed that all critical care nurses with different education level had unsatisfactory knowledge score about Ventilator Associated Pneumonia (VAP) bundle measures.

CONCLUSION

It can be concluded that majority of nursing students had excellent knowledge and good practice regarding Ventilator Associated Pneumonia (VAP). There was no significant association of knowledge with Academic year, Area of experience and source of information.

There is significant association of knowledge and practice with gender as analyzed by 6.0606, 6.7278 significant at 0.05 level of significance

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