Ventilator Associated Pneumonia Bundle among Mechanically Ventilated Patient: Nurses' Perception

Thesis

Submitted for Partial Fulfillment of the Requirements of the Master Degree in Medical Surgical Nursing (Critical Care Nursing)

By

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Reda Qurany Ahmed Mohamed

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Abb.	Meaning
AACN	: American Association of Critical Care Nurses.
AMR	: Antimicrobial resistance .
ARDS	Acute respiratory distress syndrome.
BAL	: Bronchoalveolar lavage .
CAP	: Community-acquired pneumonia
CCUs	: Critical care units.
CCU	: Cardiac Care unit.
CDC	: Center for Disease Control and Prevention.
COPD	: Chronic obstructive pulmonary disease .
CPIS	: Clinical Pulmonary Infection Score .
DAI	: Device-associated infection .
DVT	: Deep vein thrombosis .
EBGs	: Evidence-based guidelines.
EBP	: Evidence based practice.
ETT	: Endotracheal tube .
HAIs	: Hospital acquired infections
HAP	: Hospital-Acquired Pneumonia.
HOB	: Head of the bed .

H2RA : Histamine 2 receptor antagonist.

ICUs : Intensive care units.

IHI : Institute for Healthcare Improvement .

MCQs : Multiple choice questions.

MDR : Multidrug resistant .

MRSA : Methicillin-resistant Staphylococcus aureus.

MSSA : Methicillin-sensitive Staphylococcus aureus .

MV : Mechanical ventilator .

MVPs **:** Mechanically ventilated patients.

NHSN : National Healthcare Safety Network .

NP : Nosocomial pneumonia .

NSAIDs : Nonsteroidal anti-inflammatory drugs .

PSB : Protected specimen brush .

PUD : Peptic ulcer disease .

SIRS : Systemic inflammatory response syndrome .

SSD : Subglottic Secretion Drainage.

USA : United States.

USAID :United States Agency for International Development .

VAP : Ventilator associated pneumonia.

VTE : Venous thromboembolic events.

WHO : World Health Organization.

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Abstract

Ventilator associated pneumonia (VAP) is a serious complication in critically ill patients; it can prolong intubation, increase intensive care unit and hospital length of stay, and increase mortality to twice the level of patients who do not develop VAP. Ventilator bundle was a group of evidence based practices that when implemented together for all patients on mechanical ventilation will result in dramatic reductions in the incidence of VAP. **Aim of the study:** Assessing nurses' perception regarding ventilator associated pneumonia bundle. **Design:** A descriptive exploratory design was utilized. **Setting:** The study was carried out in critical care units (surgical ICU, general ICU & CCU) at El Fayoum University Hospitals. **Study subjects:** convenience sample of 40 nurses were included in the study. **Data collection tools**: Data were obtained through five main tools; demographic data tool, nurses' knowledge questionnaire, nurses' observational checklist, nurses' perception questionnaire and factors affecting nurses' perception questionnaire. **Results:** Three quarter of the study nurses had unsatisfactory knowledge and more than three quarters of them had incompetent level of practice regarding VAP bundle. About two thirds of the studied nurses had negative perception regarding VAP bundle. There were many factors affecting nurses' perception regarding VAP bundle as; nurses' related factors, health setting related factors and patients' related factors. There was statistically significant difference between the nurses' perception, level of knowledge and practice regarding VAP bundle and their demographic characteristics; educational level & years of experience in critical care unit. As well there was statistically significant difference between the nurses' perception regarding ventilator associated pneumonia bundle and their level of knowledge and practice. **Recommendations:** Designing in-service training and educational program to improve nurses' knowledge and practice regarding VAP bundle. The study should be replicated on large sample & in different hospitals setting in order to generalize the results.

Keywords: Knowledge, Practice, perception, Ventilator associated pneumonia, Ventilator bundle.

Introduction

Most of critically ill patients need mechanical ventilator (MV) which assists or replaces spontaneous breathing. Mechanically ventilated patients are more likely to develop pulmonary infection and ventilated associated pneumonia (VAP). Intubation bypasses the normal airway protective mechanisms and acts as a direct route for bacterial invasion to the airway. Critical care nurse has an important and crucial role in preventing VAP. Evidence indicates that training of critical care nurses about the implementation of VAP prevention bundle had a great effect on decreasing the incidence of VAP **(Ismail & Zahran, 2015).**

Ventilator associated pneumonia is a lower respiratory tract infection that develops in patients who are intubated for greater than 48 hours. Ventilator associated pneumonia is the most common infection in ventilated patients and the second most common hospital associated infection. Mortality rates associated with VAP range between 20% and 70%. The Center for Medicare and Medicaid listed VAP as one of the "reasonably preventable diseases "leading to increased morbidity, mortality, and

health care costs. Reduction of VAP is a national patient safety goal **(Ferrazzano, 2014)**.

The Institute for Healthcare Improvement (IHI), Centre for Disease Prevention and Control (CDC) and the American Critical Care Nurses Association (AACN) have developed VAP bundle that recommend the implementation of four to six interventions to more effectively reduce the occurrence of VAP in mechanically ventilated patients, which include oral care with chlorhexidine, maintain the head of the bed at 30-45 degrees, ensure a daily "sedation vacation" in order to assess patient readiness to wean from the ventilator, provide prophylaxis for deep vein thrombosis and peptic ulcer disease prophylaxis **(Cal, 2015)**.

It is the responsibility of the nurses to implement the VAP bundle but there are different factors that influence a person's decision for action or change, these factors, such as how the nurse perceives the seriousness of the disease, what the complications are, perceived benefits or barriers to the action, and demographics, influence the nurse's decision to implement the VAP bundle **(Luna, 2015).**

Significance of the study:

Ventilator-associated pneumonia is a significant contributor to patient morbidity and mortality in Intensive Care Units (ICU) and makes up 86% of nosocomial pneumonias . Ventilator associated pneumonia is associated with an estimated mortality rate between 20% and 70% and increased lengths of stay in ICU by 4-13 days for mechanically ventilated patients **(Luna, 2015)**.

To ensure the highest standards of nursing care, nursing practice must be based on a strong body of scientific knowledge. This can be achieved through adherence to the evidence based guidelines for prevention of ventilator associated pneumonia, ultimately improving patient's outcomes. Improved outcomes will shorten patient's ICU length of stay, hospitalization as well as benefit the patient financially with decreased hospital costs. As VAP is linked with higher morbidity, mortality and costs, preventing ventilated patients from developing VAP is an important patient safety objective **(Aferu, 2016)**.

Nurses play a vital role in infection control practices especially in the ICU. This role is linked to the amount of time nurses spend at the bedside caring for the critically ill patient as well as the numerous hands on procedures

performed for the patients who are so sick that in some cases they can barely breathe on their own. The ventilated patient is at an increased risk for acquiring ventilator-associated pneumonia especially if the bedside nurse lacks the knowledge or neglects infection control practices and established guidelines for preventing VAP **(Musvosvi, 2013)**.

Aim of the Study

This study aimed to assess the nurses' perception regarding ventilator associated pneumonia bundle, through the following:

1. Assessing level of nurses' knowledge regarding ventilator associated pneumonia bundle.
2. Assessing level of nurses' practice regarding ventilator associated pneumonia bundle.
3. Identifying factors affecting nurses' perception regarding ventilator associated pneumonia bundle.

Research questions:

1. What is nurses' level of knowledge regarding ventilator associated pneumonia bundle?
2. What is nurses' level of practice regarding ventilator associated pneumonia bundle?
3. What are the factors affecting nurses' perception regarding ventilator associated pneumonia bundle?