Central Venous Line Bundle Interventions: Effect on Patients' Outcomes

Thesis

Submitted for Partial Fulfillment of the requirement of the Doctorate Degree in Nursing Sciences

(Medical-Surgical Nursing)

By

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Introduction

Central venous catheters (CVCs) are vital in modern-day medical practice, particularly in the intensive care unit (ICU) however, their use puts patients at risk for Central Line-Associated Blood Stream Infection (CLABSI) complications. These deadly and often preventable infections increase the risk of morbidity and mortality and prolong hospital stays. Practical risk reduction strategies enable consistent application of evidence-based recommendations for central line insertion and maintenance. Healthcare workers must be educated and engaged in a culture of safety to achieve consistent application of these recommendations (Institute for Healthcare Improvement,2009).

The five key components of the central line bundle are as follows: hand hygiene, maximal sterile barriers, chlorhexidine skin antisepsis, optimal catheter site selection, and daily review of central lines is a necessity,with prompt removal of unnecessary lines (Medlline Industries,2005).

Significance of the study:

Knowledge and use of evidence-based practice are essential to ensure best practice and patients` outcomes. Physician and nurse leaders must be knowledgeable of this initiative to support clinical practice toward improving patients` outcomes. Each year, thousands of patients with an intravenous catheter in place die of Catheter-Related Blood Stream infection (CRBSI). So about 80% are affected by complications due to Central Line-Associated Blood Stream infection all over the world (Hadaway, 2007). Nurses as apart of the health care team member had a great responsibility in caring for a such group of patients.

Therefore, assessment for the effects of the central venous line bundle interventions and it`s effect on patient's outcome could improve its level of efficiency as will as effectiveness of care .

Aim of the study:

The study aims to :

Assess the effect of central venous line bundle interventions on patient's outcome through :

-Assessment of health care team (physicians and nurses) level of knowledge and practice regarding to central venous line bundle interventions.

-Develop and apply training program based on health care team need assessment for such group of patients.

-Assessment the effect of the training program on patients' outcomes regarding to central venous line bundle interventions application.

Research Hypothesis:

This study assumes that;

1- Physicians and nurses level of performance will be improved toward the application of central venous line bundle interventions.

2- Patients with central venous line bundle interventions outcomes will be improved regarding rate of infection and day of hospitalization.

Research Design:

A quasi-experimental study design will be utilized to meet the aim of this study.

I. Technical Design:

The technical design includes setting, subjects, and tools for data collection.

Setting:

This study will be conducted in the Cardio-Thoracic Intensive Care Units (ICUs) at Ain Shams University Hospital.

Subjects:

Study subjects will involve two groups, health care team (physicians and nurses) and patients.

The health care team group: It will include all the available physicians and nurses(27+50 respectively) working in the Cardio-Thoracic Intensive Care Units (ICUs) at Ain Shams University Hospital.

The patients group: Patients with central venous line in the Cardio-Thoracic Intensive Care Units (ICUs) at Ain Shams University Hospital according to sensitive analysis in relation to infection rate, the subjects of study will be (220 patients). The subjects will be divided into two groups, control group(110patients) and study group(110patients).

Tools for data collection:

Different data collection tools will be used:-

I. ***Health care team (physicians and nurses)assessment tools:***

1- A self administered questionnaire sheet: It will developed by the researcher guided by the related review of literature. It included two parts:

a - Socio-demographic data: age, gender, qualifications, experience years and previous training .

b – A knowledge assessment questions: to assess health care team level of knowledge regarding to the five key components of the central venous line bundle interventions as follows: hand hygiene, maximal sterile barriers, chlorhexidine skin antisepsis, optimal catheter site selection, and daily review of central lines is a necessity, with prompt removal of unnecessary lines.

2- ***Observation checklist for physicians and nurses practices***: This checklist will be used to check practices for central venous line bundle. It is a standardized checklist adopted from Virginia(2005), to assess the five key components of the central venous line bundle interventions.

II. Patient assessment:

It included four parts:

1. Socio-demographic data: (age and gender, educational level and diagnosis) it developed by the researcher based on the patient's inclusion criteria.

2. Patient physical assessment for the following items:

- Vital signs including pulse, blood pressure, respiratory rate, and body temperature.

- Height and weight for assessment of body mass index (BMI).

3. ***Observational checklist for patients:*** This checklist will be used to assess phlebitis scale and grading infection at the central venous line site. This tool adopted from Berenholtz, Pronovost,and Lipsett, (2008), Smeltzer and Bar, 2004)

III- Unit policy assessment: To assess presence of infection control system in the Cardio-Thoracic Intensive Care Units (ICUs) at Ain Shams University Hospital This tool adopted from Egyptian

II. Operational Design:

It will includes preparatory phase, pilot study and field work.

-Preparatory phase:

Developing the study tool in order to :

l-Assess nurses needs and patients as an objective indicators for the effect of nurse's performance post the interventions.

2-Check reliability and content validity of the developed tool.

3-Prepare physician and nurse's orientation for the central venous line bundle interventions which will be organized based on the nurses identified needs assessment by a group of specialized juries will revise its contents prior to implementation.

4-Evaluate the effect of the central vascular line bundle interventions on:

a- Physicians and nurses` level of performance(knowledge and practice).

b- Patients' outcomes of local catheter-related infection, defined as the presence of purulence or signs of inflammation (e.g., erythema , tenderness, and in duration) , catheter-related bloodstream infection and Duration of hospitalization.

-***Pilot study:***

Before performing the actual study, a pilot study was carried out on five patients having central vascular lines, and five nurses working in the intensive care units at Ain Shams University Hospitals. The pilot study was done to assess the clarity and applicability of the tools, estimate the time needed for data collection, and test the feasibility of conducting the research. After analyzing the pilot study results, modifications needed will be done accordingly, and refinements of the tools were fulfilled. Those subjects will not included in the actual study subjects.

-***Field Work:***

It will includes the implementations of the study through:

-Assessment of the physicians and nurses performance pre and post the interventions.

-Assessment of the patients' outcomes pre and post the interventions.

-Implement nursing orientation.

-Evaluate the effect of the orientation.

III. Administrative Design:

Approval to carry out this study will be obtained from from the medical directors, nursing directors, patients and nurses who working in Intesive Care Units at Ain Shams university hospital.

-Ethical Consideration:

The ethical research considerations in this study include the following:

- The research approval will be obtained from the ethical committee befor starting the study.
- The researcher will clarify the objective and aim of the study to nurses and patients included in the study.
- The researcher will be assuring maintaining anonymity and confidentiality of subjects data.
- Nurses and patients will be informed that they are allowed to choose to participate or not in the study and they have the right to withdrow from the study at any time.

IV. Statistical Design:

The collected data will be statistically analyzed and presented in tables and graphs, using appropriate reliable and valid statistical methods and tests.

Discussion:

The result obtained will be discussed in light of the available local and international studies and review.

Conclusion:

The conclusion will be derived from the results of the study and discussion.

Recommendations:

Recommendations will be derived from the discussion and based on the finding of the study.

Summary:

It will contain a brief description of the research process.

References: