# FACTORS AFFECTING NURSES' PERFORMANCE TOWARD CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTION IN CRITICAL CARE UNITS

*Thesis*

*Submitted for Partial Fulfillment of*
*The Master Degree*

*In*
*Nursing Sciences*
*(Critical Care and Emergency Nursing)*

*By*

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(B.Sc Nursing)

**Faculty of Nursing**
**Ain Shams University**
**2017**

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**2017**

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Nesma Yousef

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| | |
|---|---|
| **AHRQ** | Agency for Healthcare Research and Quality |
| **BSI** | Blood Stream Infection |
| **CGI** | Chlorhexidine Gluconate-Impregnated |
| **CHG** | Chlor-Hexidine Gluconate |
| **CLABSI** | Central Line Associated Blood Stream Infection |
| **CRIs** | Catheter-Related Infections |
| **CUSP** | Comprehensive Unit Based Safety Program |
| **CVADs** | Central Venous Access Devices |
| **CVC** | Central Venous Catheter |
| **CVP** | Central Venous Pressure |
| **DVT** | Deep Venous Thrombosis |
| **HAIs** | Hospital-Acquired Infections |
| **ICU** | Intensive Care Unit |
| **IJ** | Internal Jugular |
| **IVC** | Inferior Vena Cava |
| **PEEP** | Positive End-Expiratory Pressure |

## LIST OF ABBREVIATIONS (CONT,)

| | |
|---|---|
| **RA** | Right Atrium |
| **SCVs** | Subclavian Veins |
| **SICU** | Surgical Intensive Care Unit |
| **SSD** | Sutureless Securement Devices |
| **SVC** | Superior Vena Cava |
| **T-CVC** | Tunneled Central Venous Catheter |
| **TPN** | Total Parenteral Nutrition |

# *Abstract*

**Background:** Central venous catheter insertion is not a benign procedure. It is a potentially harmful one, if it is not performed correctly, it might result in life threatening complications. Thus, nurses should remain sensitive to possible hazards and complications**,** all intensive care nurses should be aware when performing this intervention of the potential risk a patient is exposed to, and should make an effort to prevent or minimize these. **Aim of study:** to assess nurses' performance toward CLABSIs and assess the factors affect their performance at the ICUs of Ain Shams University Hospitals**. Research design:** A descriptive research design was utilized. **Sample:** A convenient samples of 100 nurses were included in the current study. **Setting:** This study was carried out at the Intensive Care Units of Ain Shams University Hospitals. **Tools of data collection:** Four tools were developed by the investigator and utilized to collect data pertinent to the current study: nurses' knowledge self-administered questionnaire regarding CLABSIs, Factors assessment questionnaire and Nurses' practices observational checklist to assess their performance of Central Venous Catheter insertion and care procedure and nurses' attitude Likert scale. **Results:** Around (92%) of the studied sample had unsatisfactory knowledge level, the great majority (91%) of the studied sample had unsatisfactory practice level. There is statistically significance deference in the mean knowledge scores in relation to years of experience in the intensive care unit ($p = 0.009$). A statistically significance in the total practice scores in relation to years of experience in the intensive care unit ($p = 0.048$). Total of positive attitudes are about (43%), Total of negative attitudes are about (57%). And the factors were suggested by researcher affect nurses' performance toward Central Line Associated Bloodstream Infections in percentage (88%). **Conclusion:** Inspite of having vital role in assessment and management of critically ill patients, critical care nurses in the current study had unsatisfactory knowledge, practice and attitude regarding CLABSIs, and there are many factors affect their performance, factors related to setting, factors related to patient and factors related to nurses. **Recommendation:** updating knowledge and practices of ICU nurses through carrying out continuing educational programs including evidence based guidelines about CLABSIs; Ongoing monitoring of staff nurses' practice while practicing CVC insertion and care and replication of this study on larger probability sample.

**Key Words:** CLABSIs, ICU Nurses' Knowledge, Practices and attitude, factors affect performance.

# Introduction

Sepsis is life threatening and can be caused by Bloodstream Infections (BSIs) associated with Central Venous Catheters (CVCs). The probability of infection with an increase in Intensive Care Unit (ICU) stay at greater cost can occur with long-term CVC use. Because of the costs of primary BSIs, it is important to continue research on the effectiveness of any viable alternative **(Shah, Schwartz, Luna & Cullen, 2016)**.

Central Venous Catheters (CVCs) are necessary to deliver lifesaving medications and offer a source for hemodynamic monitoring of the intensive care unit (ICU) patient. However, the longer these catheters are in use, the potential for exposure to central line–associated bloodstream infections (CLABSIs) and development of sepsis increases greatly **(Shah et al., 2016).**

Central venous access is indicated when peripheral veins are inaccessible, for administration of potent vasoactive drugs such as norepinephrine, when irritating or hypertonic solutions or parenteral alimentation are infused, when incompatible medications must be infused through a

multilumen catheter, when acute or subacute hemodialysis or hemofiltration is needed, or for hemodynamic monitoring or transvenous cardiac pacing. Large bore central venous catheters also facilitate extremely rapid infusion of resuscitation fluid **(Taylor & Palagiri, 2007)**.

A central venous line may affect the patient´s well-being in other respects, as it may be inconvenient and painful, leading to restrictions in daily activities and a change in body image. It is also evident that major as well as minor complications lead to increased costs, due to extra nursing and prolonged hospital care **(Johansson, Hammarskjöld, Lundberg & Arnlind, 2013).**

Central Venous Catheters (CVCs) are inserted in a number of hospital locations (intensive care units, theatres, wards, radiology department) with varying techniques for insertion and for ensuring correct catheter placement. Whatever the indication or type of the central catheter inserted, the usual aim is to place the catheter tip in as optimal central vein location as is possible, avoiding misplacement and other complications of insertion **(Gibson, & Bodenham, 2013)**.

There are many factors affect the nurses' performance toward CLABSI, these factors are independent risk factors for CLABSI, the factors associated with increased risk are prolonged hospitalization before catheterization, prolonged duration of catheterization, heavy microbial colonization at the insertion site, heavy microbial colonization of the catheter hub, internal jugular catheterization, femoral catheterization in adults, neutropenia, prematurity, reduced nurse-to-patient ratio in the ICU, total parenteral nutrition, substandard catheter care and transfusion of blood products (in children) **(Marschall, Mermel, Fakih, Hadaway, Kallen, O'Grady & Yokoe, 2014).**

Central Line Associated Bloodstream Infections (CLABSIs) and other hospital-acquired infections (HAIs) haunt the health care system by increasing hospital and patient costs, resulting in expensive antibiotic therapy and death due to sepsis. CLABSIs may be the second most preventable cause of hospital death **(Shah et al., 2016).**

**Operational definition:**

**Nurses' performance** is three domains knowledge, practice and attitude of nurses under the study.