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EVALUATION OF NURSES' COMPETENCE IN CENTRAL VENOUS CATHETER-ASSOCIATED INFECTION PREVENTION

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Abstract

Central venous catheters (CVCs) are widely used in intensive care units for administering fluids, medications, nutrition, and for hemodynamic monitoring. Proper care of CVCs is critical, as they pose a significant risk for bloodstream infections. This study aimed to assess nurses' knowledge and practices regarding the prevention of CVC-associated infections. A descriptive cross-sectional study was conducted among nurses working in critical care settings. Data were analyzed using descriptive statistics, including frequency distributions, and normality checks. Among the participants, 61 (41.2%) demonstrated poor knowledge of CVC infection prevention, while 53 (35.8%) exhibited suboptimal practices. The study highlights that a substantial proportion of nurses possess inadequate knowledge and engage in poor practices concerning CVC infection prevention. Targeted educational interventions and training programs are recommended to enhance adherence to evidence-based infection control practices.

INTRODUCTION

The lumen of a central venous catheter (CVC) is located within the inferior vena cava, superior vena cava, or right atrium after being advanced into a major, central vein (typically the internal jugular, subclavian, or femoral) (Kolikof, Peterson, & Baker, 2020). The insertion of a central venous catheter (CVC) is one of the most common invasive procedures, not only in intensive care and anesthesia, but also in oncology and emergency medicine These devices seem to be everywhere, and prolonged use may make people forget about the side effects over time. However, significant morbidity and mortality can be attributed to the device or the insertion procedure, and the overall complication rate for CVCs is approximately 20% (Lennon, Zaw, Pöpping, & Wenk, 2012). Central line-associated bloodstream infections (CLABSIs) are the most common complication of central venous catheters (CVCs), with an incidence of 4.1 per 1000 central line days(Haddadin, Annamaraju, & Regunath, 2017). CLABSIs are associated with increased morbidity, mortality, and medical costs. A meta-analysis shows that patients with CLABSI have an 2.75-time higher risk for hospital death than those without CLABSI(Chi et al., 2020).Central venous puncture complications are estimated to occur at 15%. These complications fall into two categories infectious and mechanical. Pneumothorax, blood vessel cut, and hematoma are the most well-known mechanical problems (Cavanna et al., 2010). A hematoma, a cardiac tamponade, a guidewire embolism, an air embolism, an arrhythmia, a thoracic duct injury, or an air embolism are less common but may be more serious. If the procedure is done correctly, some of these problems can be avoided (Comerlato et al., 2017). Knowledge is consider as crucial element in prevention from central line associated blood stream. It has been

observed that nurses in the intensive care unit care for and spend the most time with CVC-infected patients (Aloush, 2018). By implementing evidence-based best practices, they also contribute significantly to primary infection prevention. (Esposito, Guillari, & Angelillo, 2017). In addition to possessing sufficient knowledge and training in the prevention of CVC-BSI, health professionals are required to adhere to up-to-date CVC care guidelines, according to the Centers for Disease Control and Prevention-CDC (Kilpatrick, Hutchinson, Manias, & Bouchoucha, 2021). The literature emphasizes that nurses can avoid CVC-associated infections if they are aware of evidence-based guidelines and practices and have a high level of knowledge about CVC-BSI. (Temiz, KIZILTAN, & Kanbay, 2022)The proper practice of nurses is increasing the recovery of patient quickly. Several international organizations have published clinical practice guidelines for the prevention of CLABSIs(Chi et al., 2020). These guidelines typically include specific steps that health care workers who insert and handle CVCs should take(Dedunska & Dyk, 2015). The research studies investigate that the infection rate is still high and the nurses have limited knowledge regarding the CVC associated infection prevention. The central venous catheter CVC associated infection is the ultimate causes of nosocomial infection and responsible for high mortality and increase hospital stay. that ultimately burden the health care system so there is intense need to highlight these issues.So the study to assess knowledge and Practice of nurses regarding Central Venous Catheter Associated infection prevention.

METHOD

A descriptive cross sectional study design was conducted knowledge and practice nurses regarding CVC associated infection prevention. The purposive sampling technique was used. Study of the population was staff nurses medical ward surgical and ICU of Jinnah hospital Lahore. setting of the study was Jinnah hospital Lahore. The study sample was 147 calculated through slovins formula. Duration of this study was 9 months. An adopted questionnaire of knowledge and practice was used to gather the information from the study sample. Knowledge and practice nurses regarding CVC associated infection prevention. Data was gathered from all staff nurses working in surgical ward, medical ward, and ICU. Data was collected an adopted questionnaire of knowledge and practice regarding CVC Associated infection prevention. After collecting data, the data was compute analyze by software program (SPSS) version (22). Ethical consideration was followed which is organize by the superior university department of nursing. The participant all the confidentiality was ensure any participant who are not wailing to participate can be withdraw from the study at any time there will be no potential harm potential benefits for the study.

CHAPTER ANALYSIS

Variable	Category	Frequency%
Age	21-25 years	30 (20.3%)
	26-30 years	55 (37.2%)
	31-35 years	51 (34.5%)
	36-40 years	12 (8.1%)
Gender	Male	71 (48.0%)
	Female	77 (52.0%)
Marital Status	Single	73 (49.3%)
	Married	75 (50.7%)
Experience	1-5 years	19 (12.8%)
	6-10 years	56 (37.8%)
	10-15 years	69 (46.6%)
Qualification	Diploma in Nursing	25 (16.9%)
	Post RN	80 (54.1%)

	BSN (Generic)	43 (29.9%)
Department	ICU	67 (45.3%)
	Medical wards	48 (32.4%)
	Surgical Wards	33 (22.3%)

Table no 1. Demographic characteristics

This demographic table shows that majority of age group with 26-30 years. Majority population were female. The Majority with married marital status. Majority of nurses with 10-15 years' experience. Majority with Post RN in Nursing. Majority of nurses working were in ICUs.

Table 2: Knowledge questionnaires

Majority of the Participants have good knowledge regarding "It is recommended to change the dressing on the catheter insertion site?". Majority of the Participants have average knowledge regarding "It is recommended to replace Central Venous Catheters Central Venous catheter routinely?". Majority of the Participants have average knowledge regarding "It is recommended to disinfect the catheter insertion site with?". Majority of the Participants have average knowledge regarding "When blood, blood products, or lipid emulsions are administered through a Central Venous Catheter, it is recommended to place the administration set?".

Questions	Respond	Frequency %
It is recommended to change the dressing on the catheter insertion site?	Every 2 days	100(67.6%)
	Every 7 days	39 (26.4%)
	No, because.....	9 (6.1%)
It is recommended to replace Central Venous Catheters Central Venous catheter routinely?	Every 7 days	30 (20.3%)
	Yes, every 3 weeks	21 (14.2%)
	No, only when indicated	97 (65.5%)
It is recommended to disinfect the catheter insertion site with?	70% alcohol	35 (23.6%)
	2% chlorhexidine gluconate with alcohol	84 (56.8%)
	Povidone-iodine	28 (18.9%)
	I do not know	1 (7%)
When blood, blood products, or lipid emulsions are administered through a Central Venous Catheter, it is recommended to place the administration set?	Within 24 h	25 (16.9%)
	Every 72 h	38 (25.7)
	Every 96 h	81 (54.7&)
	I don't know	4 (2.7&)

Table 3: Practice questionnaires

Majority of the participants were high practice regarding "Do you inform the patient regarding the procedure, when able to communicate?". Majority of the participants were good practice regarding "Do you receive the consent of the patient and/or relatives?". Majority of the participants were moderate practice regarding "Do you place the patient in the proper anatomical position?". Majority of the participants were poor practice regarding "Do you follow sterile technique (cap, mask, gloves, gown, field)?".

Questions	Respond	Frequency%
Do you inform the patient regarding the procedure, when able to communicate?	Never	26 (17.6%)
	Seldom	20 (13.5%)
	Always	102 (98.9%)
Do you receive the consent of the patient and/or relatives?	Never	21 (14.2%)
	Seldom	25 (16.9%)
	Always	102 (98.9%)
Do you place the patient in the proper anatomical position?	Never	16 (10.8%)
	Seldom	49 (33.1%)
	Always	83 (56.1%)
Do you follow sterile technique (cap, mask, gloves, gown, field)?	Never	37 (25.0%)
	Seldom	52 (35.1%)
	Always	59 (39.3%)

DISCUSSION

Majority of Participants respond to every 2 day option to the question that the "It is recommended to change the dressing on the catheter insertion site?" were 100(67.6%). Majority of Participants respond to No when indicted option to the question that It is recommended to replace Central Venous Catheters Central Venous catheter routinely? Were 97(65.5%). Majority of Participants respond to 2% chlorhexidine gluconate with alcohol option to the question that It is recommended to disinfect the catheter insertion site with? was 84(56.8%). Majority of Participants respond to every 96 h option to the question that the When blood, blood products, or lipid emulsions are administered through a Central Venous Catheter, it is recommended to place the administration set?'. were 81(54.7%). Majority of Participants respond to always option to the question that Do you inform the patient regarding the procedure, when able to communicate? Were 102(98.9%). Majority of the nurses were Always 102(98.9%) to the question "Do you receive the consent of the patient and/or relatives? Majority of the nurses were strongly always 83(56.1%) to the question Do you place the patient in the proper anatomical position?". Majority of the nurses were always were 59(39.3%), to the question "Do you follow sterile technique (cap, mask, gloves, gown, field)?

CONCLUSION

The current study concluded that the knowledge and practice regarding central venous catheter associated infection prevention is poor. this is the need of time to work on nurses' knowledge and practice regarding infection prevention of central venous catheter. so, this can reduce the infection which is related to Central venous catheter and improve patient's condition. There is high need to better nurse knowledge and practice through conducting education programs regarding central venous catheter.

LIMITATION

The current study used cross-sectional study design to identify the knowledge and practice regarding central venous catheter associated infection prevention is poor

RECOMENDATION

The current study investigates the level of knowledge and practice regarding central venous catheter associated infection prevention. The future research can work on enhancement of knowledge and practice by conducting experimental studies through which they can assess knowledge and practice to give the intervention for improving the knowledge and practice of nurses regarding central venous catheter associated infection prevention. Future research can provide education to nurses regarding the standard protocol and precaution for maintaining central venous catheter.

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