Original article

KNOWLEDGE REGARDING CENTRAL LINE-ASSOCIATED BLOOD STREAM INFECTION PREVENTION AMONG HEALTH PERSONNEL OF NARAYANI HOSPITAL, BIRGUNJ

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ABSTRACT

Background: A Central Line-Associated Bloodstream Infection (CLABSI) is defined as a primary laboratory-confirmed bloodstream infection that occurs in a patient with a central line within 48 hours of its placement. Most of these infections can be prevented with the correct insertion technique, cleaning, and care practice of a central line. The aim of this study was to find out knowledge regarding Central Line-Associated Bloodstream infection prevention among health personnel of a Hospital.

Methods: A descriptive cross-sectional study, among 77 health personnel working in the Intensive Care Unit, Neonatal intensive care unit, Pediatric intensive care unit, Operation theatre, emergency and Hemodialysis units of Narayani Hospital, was carried out. Data were collected from 22nd Dec 2022 to 5th Jan 2023 using self-administered structured questionnaires. The data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (chi-square) in SPSS (Statistical Package for Social Science) version 16.

Results: The study showed that 67.5% of respondents had an adequate level of knowledge while 32.5% of health personnel had an inadequate level of knowledge regarding Central Line-Associated Bloodstream Infection prevention. Moreover, it was found that the level of knowledge was significantly associated with sex (p=0.048), educational qualification (p= 0.026), and profession (p= 0.001) of the respondents.

Conclusions: Nearly one-third of the health personnel had inadequate knowledge regarding Central Line-Associated Bloodstream Infection prevention. Hence, there was a need to improve the knowledge of health personnel regarding Central Line-Associated Bloodstream Infection Prevention through in-service education and training.

***Keywords:** CLABSI, health personnel, maintenance of CVCs*

INTRODUCTION

According to the World Health Organization (WHO), up to 30% of patients in intensive care units (ICUs) acquire healthcare-associated infections, the majority of which are bloodstream infections resulting from the presence of a catheter in the lumen of the veins. Educating staff on aseptic care of patients with a central venous catheter (CVC) can reduce the incidences of infection.[1, 2]

Globally, an estimated 250,000 bloodstream infections occur annually, and most are related to the presence of intravascular devices that carry a mortality rate of 12-15%.[3] CLABSI has a significant impact on the overall healthcare costs. Knowledge about risk factors and infection control measures for CLABSI prevention is crucial for best clinical practice.[4] Several risk factors have been identified for CLABSIs such as a prolonged duration of catheterization, microbial colonization at the insertion site and of the catheter hub, and inadequate care/maintenance of the CVC after insertion.[5] Therefore, improving the quality of health care is a key priority, since a reduction of CLABSIs is considered to be largely preventable when evidence-based guidelines for the insertion and maintenance of CVCs are followed, such as hand washing, using full-barrier precautions during central venous catheter insertion, cleaning the skin with chlorhexidine, and removing unnecessary catheters.[6] Approximately 65 to 70% of CLABSI is preventable.[7]

The critical units of hospitals are the Intensive Care Unit, Operation Theater, Emergency, and Hemodialysis where most central venous catheter insertion takes place. If universal precautions aren't properly applied in those units, Healthcare-Associated Infections (HAIs) such as Central Line-Associated Bloodstream Infection (CLABSI) may occur which can be life-threatening.[8] CLABSIs have been a significant challenge in care, increasing healthcare costs and leading to adverse outcomes, including mortality.[9]

Some studies from Middle-East and south-West Asia reported insufficient knowledge on the prevention of CLABSIs among nurses whereas, some studies have shown adequate knowledge and were significantly higher among those who received training. [9, 10, 11]

METHODS

A descriptive cross-sectional study was conducted to find out the level of knowledge regarding CLABSI prevention among health personnel of a tertiary hospital. The study was conducted at Narayani Hospital, Birgunj, Parsa. The study population consisted of all health personnel working in the ICU, NICU, PICU, Emergency, OT, and Hemodialysis unit of Narayani Hospital & willing to participate in the study. A total of 77 samples were included in the study using a consecutive sampling technique. A self-administered Structured Questionnaire was developed to gather data. The instrument consisted of 2 parts; Part 1-sociodemographic information & Part 2- a questionnaire related to knowledge regarding CLABSI prevention. The validity of the tool was established by doing an extensive literature review and seeking opinions from colleagues and research guides. Pre-testing was done among 10 health personnel of similar settings who were working as ANM, CMA, Nurses, Doctors, and anesthetists in Prabhu Hospital and Research Center, Parsa. The ethical standard for the study was maintained by obtaining approval from the Research management cell of Birgunj Nursing Campus. Administrative approval was taken from Birgunj Nursing Campus & Narayani Hospital. A permission letter was submitted to the incharges of each ward. The informed written consent was obtained from each respondent. Confidentiality and anonymity were maintained. The collected data were checked, reviewed, and organized daily. Then were coded, tabulated, and entered into the SPSS 16 Version. Data were analyzed on the basis of research objectives by using descriptive statistics and inferential statistics.

RESULTS

Table 1. Socio-demographic and professional characteristics **n=77**

Characteristics	Number	Percent
Age in completed years		
20-30	46	50.0
31-40	20	21.7
41-50	11	11.9
51-60	15	16.3
Sex		
Female	43	55.8
Male	34	44.2
Education		
Graduate	22	28.6
Undergraduate	55	71.4
Profession		
Doctor	25	32.5
Nursing	39	50.6
Paramedics	13	16.9
Working area		
OT	17	22.1
NICU/PICU/ICU	39	50.6
Emergency	14	18.2
Haemodialysis	7	9.1
Job experience		
Less than 1year	8	10.4
1-5 years	41	53.2
6-10 years	20	26.0
More than 10 years	8	10.4
Training regarding CLABSI prevention		
Yes	3	3.9
Care of CLABSI patient		
Yes	23	29.9

Table 1 shows, among all the respondents, 50% were between the ages of 20-30 years of age and more than half (55.8%) were female. More than one-third (71.4%) were undergraduate whereas 50.6% were nursing staff. More than half (50.6%) of respondents were working in ICU and 53.2% had 1-5 years of experience. Regarding training on CLABSI prevention, very few (3.9%) respondents had received training while 70.1%of respondents hadn't cared for any patient with CLABSI .

Table 2. Respondents' level of knowledge regarding CLABSI prevention **n=77**

Level of knowledge	Knowledge Score	Number	Percent
Inadequate (≤50%)	≤19	25	32.5
Adequate (>50%)	>19	52	67.5

Table 2 reveals that 67.5% of the respondents had adequate knowledge while 32.5% had inadequate knowledge regarding CLABSI prevention.

Table 3. Association between respondents' level of knowledge on CLABSI prevention and selected variables **n= 77**

Variables	Categories	Level of knowledge		Chi-Square	p-Value
		Inadequate No. (%)	Adequate No. (%)		
Sex	Male	7 (20.6)	27 (79.4)	3.919	0.048
	Female	18 (41.9)	25 (58.1)		
Educational Qualification	Graduated	3 (13.6)	19 (86.4)	4.981	0.026
	Undergraduate	22 (40.0)	33 (60.0)		
Profession	Doctor	6 (35.3)	11 (64.7)	23.313	0.001
	Nursing	18 (46.2)	21 (53.8)		
	Paramedics	5 (38.5)	8 (61.5)		
	Anesthetics	2 (32.5)	6 (75.0)		

(x^2 = chi square, p-Value =<0.05)

Table 3 represents association between respondents' level of knowledge on CLABSI prevention and selected variables where sex ($\chi2$=3.919, p= 0.048), educational qualification ($\chi2$= 4.981, p= 0.026) and profession ($\chi2$= 23.313, p= 0.001) tended to have an association with the level of knowledge.

DISCUSSION

This study revealed, 67.5% of respondents have adequate knowledge while 32.5% of the respondents have inadequate knowledge regarding CLABSI prevention which is similar to the study conducted in Iran among ICU nurses.[10] The study showed significant association between profession ($\chi2$ = 23.313, p= 0.001) & educational qualification ($\chi2$ = 4.981, p= 0.026) with level of knowledge which is similar to the findings of other studies.[10, 12]

This present study revealed working area ($\chi2$ = 0.221, p= 0.974) is not associated with level of knowledge which is contrary to a study conducted in China that showed significant association between level of knowledge and working area (p= 0.05).[9] This might be due to difference between population, their working environment & work experience. Some studies have shown knowledge was significantly higher among those who received training which is contrary to the findings of this present study. [9, 10, 11] This can be due to difference in number of sample who received training on CLABSI prevention.

CONCLUSIONS

On the basis of the study findings, it is concluded that more than half of the health personnel tend to have adequate knowledge regarding CLABSI prevention. There is a significant association between the level of knowledge with sex, educational qualification, and profession.

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