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Research Article

A Correlational Study to Assess the Knowledge and Practices Regarding Central Line-Associated Bloodstream Infection Care Bundle among the Staff Nurses in Selected Hospitals of Maharashtra in View to Prepare the Multi Modular Learning Tool

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Abstract

The aim of this research is to assess the level of knowledge held by staff nurses in relation to the central line-associated bloodstream infection care bundle as well as their actions. The investigator chose to use a descriptive survey approach with descriptive study design and to investigate the staff nurses' knowledge of and behaviors relating to the central line-related bloodstream infection treatment package. The sample consisted of 125 registered nurses who were working in the intensive care unit of the hospital. For this investigation, a non-probability purposeful sampling strategy was utilized to select the sample. The analysis of the information included both descriptive and inferential statistical methods. The Karl Pearson correlation coefficient test and the Chi-square test used to refer to examine the correlation and determine the relationship between knowledge and practice about the treatment of bloodstream infections linked with central lines and demographic factors. The findings of this investigation demonstrated that 79 (63.2%) had inadequate knowledge followed by 38 (30.4%) had moderate knowledge and 8 (6.4%) had adequate knowledge regarding central line-associated bloodstream infection (CLABSI) care bundle. Seventy-five (60%) had poor level of practices, 40 (32%) had average level of practices, and 10 (8%) had good level of practices regarding CLABSI care bundle, there is positive correlation that was identified between knowledge and practices, that is, ($r = 0.7501$). According to the results of this investigation, staff nurses had knowledge and practices about the care bundle for central line-related bloodstream infections that were on average appropriate. Investigator recommends that the distribution of the multi modular learning tool addressing the central line-related bloodstream infections care bundle, both the knowledge, and the practices will be enhanced.

Keywords: Care bundle, central line-associated bloodstream infection, knowledge, multimodular learning tool, practice

Introduction

An infection is brought on by the invasion of pathogens into tissues, their subsequent growth, and the host's tissues' response to the infectious agent and the pathogens' toxins. Any ailment brought on by an infection is referred to as an infectious disease. Other names for infectious illnesses are communicable diseases and transmissible diseases.

There are many different disease-causing agents that may cause infections, but bacteria and viruses are the most frequent ones. Due to their immune systems, hosts can fight off infections. Mammalian hosts first display an innate reaction to infections, which often include inflammation, and subsequently, they participate in an adaptive response.[1]

Infections contracted while undergoing medical or surgical treatment are referred to as "healthcare-associated infections"

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(HCAIs). Most common unfavorable condition associated with the delivery of healthcare is an infection.[2] The effects of HCAI can result in a prolonged long-term disability, a significant additional financial burden on the health-care system, hospital stay, an increase in the resistance of microorganisms to antimicrobial agents, large costs for both the his or her family and patient, and a higher risk of death. HCAI is a serious threat to patient safety.[3,4] Although there is a global danger of developing HCAI that impacts all hospitals and health-care systems, the true scope of the issue is unclear in many nations, especially in developing nations. Data on the prevalence of illnesses throughout the globe are regularly published by the World Health Organization. The public, decision-makers, and health-care professionals are intended to be made aware of these facts about the most severe diseases with regard to their morbidity and mortality rates.[5] There was no mention of HCAI on the list of around 100 different illnesses that were looked at. The most plausible reason for this is because HCAI diagnosis is challenging and relies on a variety of variables rather than a single laboratory test. Furthermore, there are not many cases of ongoing national surveillance systems in use. HCAI seems to be a hidden, system-wide problem in many various kinds of care institutions, comprising both hospitals and ambulatory care health centers, as well as facilities providing long-term care that no institution or nation can currently claim to have managed. In critical care units, infections of the bloodstream brought on by central lines, commonly referred to as central line-associated bloodstream infection (CLABSIs) intensive care unit (ICUs), CLABSI is a significant contributor to a rise in mortality and illnesses. The adoption of clinical procedures that are backed by research is necessary for the prevention of CLABSI, as is the observation of therapeutic interventions. Even if evidence-based CLABSI prevention strategies have been devised, it may be challenging to guarantee that they are regularly implemented. As a result, every endeavor aiming at improving the quality of therapy must include assessing both the results and the processes of an intervention.[6]

Objectives

The objectives of the study are as follows:

1. To assess knowledge regarding CLABSI care bundle among staff nurses
2. To assess practices regarding CLABSI care bundle among staff nurses
3. To determine correlation between knowledge and practices regarding CLABSI care bundle among staff nurses
4. To find association between knowledge and practices with demographic variables among the staff nurses.

Assumptions

1. The staff nurses may have limited knowledge regarding CLABSI care bundle
2. The staff nurses may have inadequate practice regarding CLABSI care bundle
3. There is no correlation between knowledge and practices regarding central line-associated bloodstream infection care bundle among staff nurses
4. Multimodular learning tool may enhance the knowledge and practices among staff nurses regarding CLABSI care bundle.

Materials and Methods

Research approach

The research method adopted for the present study is descriptive survey approach.

Research design

In the present study, the investigator selected the descriptive survey design, keeping in the view of objectives of the study.

Setting of the study

"The present study was conducted in Ashirwad accidental Hospital."

Population

The population of the targeted population is nurses who are working in ICU of selected hospital.

Sample and sampling technique

In the present study, non-probability purposive sampling technique uses by the investigator.

Sample size

Total sample size for 125 staff nurses who met the inclusion criteria were selected for the present study.

Sampling criteria

Inclusion criteria

The following criteria were included in the study:

- Nurses working in the selected hospitals of city
- Nurses who are registered with nursing council
- Nurses who are willing to participate in the study
- Nurses who are working in the ICU of hospital.

Exclusion criteria

The following criteria were excluded from the study:

- Nurses who are working in government hospitals
- ANM nurses
- Nurses who are working in NICU and PICU.

Description of the tool

The tool or the study instrument is divided into three parts.

- Part A: Sociodemographic variables
- Part B: Structured knowledge questionnaire regarding CLABSI care bundle
- Part C: Practice check list regarding CLABSI care bundle.

Statistics

Descriptive statistics

Frequency and percentage distribution are used to analyze the demographic data.

Inferential statistics

Karl Pearson correlation coefficient test used to analyze the correlation between knowledge and practices regarding

CLABSI care bundle, the Chi-square test used to assess the association of knowledge and percentage with their demographic variables.

Results

The data obtained were organized in the master sheet for tabulation, statistically analyzed, and interpreted using descriptive and inferential statistics. The findings were presented under the following headings.

- Section A: Distribution of respondents according to demographic variables
- Section B: Assessment of knowledge regarding CLABSI care bundle
- Section C: Assessment of level of practices checklist regarding CLABSI care bundle
- Section D: Determine correlation between knowledge and practices regarding CLABSI care bundle among the staff nurses
- Section E: Association between knowledge and the demographic variables among the staff nurses
- Section F: Association between practices and demographic variables among the staff nurses.

Section A: Distribution of respondents according to demographic variables

Table 1 depicts that:

Age

The majority of the respondents, 83 (66.4%), were in the age range of 20–29 years, followed by 24 (19.2%), 30–39 years, 15 (12%), 40–49 years, and 3 (2.4%), 50 years and above.

Gender

The majority 110 (88%) the respondents were female and 15 (12%) were male.

Educational qualification

Most of the respondents 61 (31.2%) were completed the education as GNM, followed by 39 (31.2%) were completed B.B.sc (N) and 25 (20%) were completed P.B.B.sc (N).

Years of experience

The year of experience majority of the respondents 65 (52%) is having the experience between 1 and 5 years, followed by 30 (24%) respondents have experience <1 year, 25 (20%) respondents have experience between 6 and 10 years, and 5 (4%) of respondents have more than 10 years of experience.

Have you heard about CLABSI care bundle

Most of the respondents 120 (96%) heard about CLABSI care bundle following 5 (4%) did not heard about the CLABSI care bundle.

Are you aware of the elements of the CLABSI care bundle

Most of the respondents 124 (99.2%) were aware about the elements of CLABSI care bundle that following 1 (0.8%) did not aware about the elements of CLABSI care bundle.

Do you utilize the CLABSI care bundle in your unit

The majority of the respondents 124 (99.2%) utilized CLABSI care bundle in there unit that following 1 (0.8%) did not utilize CLABSI care bundle in there unit.

Have you completed any training program associated with CLABSI care bundle

The majority of 109 (87.2%) respondents have completed their training program associated with CLABSI care bundle and 16 (12.8%) did not complete their training program associated with CLABSI care bundle.

Section B: Assessment of knowledge regarding CLABSI care bundle

This section deals with the analysis and interpretation of knowledge level being summated using frequency and percentage.

The data presented in Table 2 depict that in most of respondents, 79 (63.2%) had inadequate knowledge, followed by 38 (30.4%) had moderate knowledge and 8 (6.4%) had adequate knowledge regarding CLABSI care bundle [Table 2].

Table 1: Frequency and percentage distribution of respondents *n*=125

Characteristics	Category	Respondents	
		Frequency	Percentage
Age group (years)	20–29 years	83	66.4
	30–39 years	24	19.2
	40–49 years	15	12
	50 years and above	3	2.4
Gender	Male	15	12
	Female	110	88
Educational qualification	GNM	61	48.8
	B.Bsc (N)	39	31.2
	P.B.Bsc (N)	25	20
	M.Sc (N)	0	0
Year of experience	<1 year	30	24
	1–5 years	65	52
	6–10 years	25	20
	More than 10 years	5	4
Have you heard about CLABSI care bundle	Yes	120	96
	No	5	4
Are you aware of the elements of the CLABSI care bundle	Yes	124	99.2
	No	1	0.8
Do you utilize the CLABSI care bundle in your unit	Yes	124	99.2
	No	1	0.8
Have you completed any training program associated with CLABSI care bundle	Yes	109	87.2
	No	16	12.8

CLABSI: Central line-associated bloodstream infection

Table 2: Knowledge score of staff nurses regarding CLABSI care bundle *n*=125

Knowledge score	Frequency	Percentage
Adequate	08	6.4
Moderate	38	30.4
Inadequate	79	63.2

CLABSI: Central line-associated bloodstream infection

Section C: Assessment of score level of practice checklist

This section deals with the analysis and interpretation of practice level being summated using frequency and percentage.

The data presented in Table 3 depict that in most of respondents, 75 (60%) had poor level of practices, 40 (32%) had average level of practices, and 10 (8%) had good level of practices regarding CLABSI care bundle [Table 3].

Section D: Determine correlation between knowledge and practices regarding CLABSI care bundle among the staff nurses

The presented data in Table 4 depict that there is positive correlation that was identified between knowledge and practices, that is, (r = 0.7501) [Table 4].

Section E: Association between knowledge and the demographic variables among the staff nurses

Table 5 depicts that there was no significant association between age, gender, educational qualification, year of experience, Have You Heard About CLABSI Care Bundle, Are You Aware Of The Elements Of The CLABSI Care Bundle, Do You Utilize The CLABSI Care Bundle In Your Unit, Have You Completed Any Training Program, and knowledge level of CLABSI care bundle among the staff nurses [Table 5].

Section F: Association between practice with demographic variables among the staff nurses

Table 6 depicts that there was no significant association between age, gender, years of experience, educational qualification, Are You Aware Of The Elements Of The CLABSI Care Bundle, Do You Utilize The CLABSI Care Bundle In Your Unit, Have You Completed Any Training Program, and Practice level of CLABSI Care bundle among the staff nurses, and there was significant association between, Have You Heard About CLABSI Care Bundle, Associated With CLABSI Care Bundle, and practices level of CLABSI Care bundle among the staff nurses [Table 6].

Discussion

Perumal *et al*. conducted study on knowledge, skills, and compliance of nurses related to central line-associated bloodstream infection in the cardiovascular department at King Faisal Riyadh Research Center and Hospital. This prospective interventional trial was carried out in a cardiac center. After getting the nurses' consent to engage in the pre-test, post-test, and skills review, we chose eighty nurses at random to participate. Results in total, there were 80 people who took part in the research we've done. The bulk of the community which participated in research the ages of 25 and 34 making about 51.25% of the total. There were 68 women (85%). In terms of job experience, participants with 6–10 years of experience made up the largest number (37.5%) of the cohort. In spite of the fact that, the mean scores on the central line-associated bloodstream infection knowledge-related pre-test and post-test were, respectively, 6.8 and 1.11, The average compliance ratings for central line-associated bloodstream infections were 8.1 0.99 and 8.3 0.97. Assumption according to the research, the level of central line-associated bloodstream infection comprehension and compliance was much higher among nurses having over 5 years of clinical experience. The CLABSI pre-test and post-test results were significantly correlated with the educational level of nurses.[7]

Dyk *et al*. conducted study on a prospective, multicenter study to evaluate the level of knowledge regarding the prevention of CLABSI among intensive care nurses in Poland. Four hundred and sixty eight of the 750 surveys that were handed out were returned. Over 80% of responders were women, who made up 95.73% of the total. Over 82% of the nurses who answered to the poll (85.9%) said that they had gone through training on CVC guidelines, rating their comprehension as good or very good. The primary acknowledged sources of information were the guidelines that were implemented in hospitals. In addition, more than half of respondents (68%) were also familiar with the global standards. The nursing personnel in the study area do not have appropriate knowledge. The prevention of CLABSIs in ICUs should follow standardized principles, according to studies, and staff members should get ongoing training in this area.[8]

Almahmoud *et al*. conducted study on This study's objective was to assess the level of expertise and practices relating to the placement and administration of central lines in adult ICUs, in a Saudi Arabian tertiary care facility. In this particular study, there were a total of 171 nurses as well as 41 physicians who participated. Among the 12 knowledge questions, almost 90% of HCWs responded 9 accurately, particularly those that dealt with maximum barriers, daily assessment, dressing change, and hand hygiene. The mean knowledge level was 82%, while those with central line bundle training scored substantially higher. Self-reported compliance with ten distinct package recommendations was between 50% and 97% (all or most of the time); the maximal barrier, hand hygiene, and utilizing chlorhexidine had the highest compliance rates (97% each), while using the subclavian site had the lowest compliance rates (50%). The nurses outperformed the average population, with a score of 87% according to self-reported compliance. Practice and knowledge had a marginally positive link (correlation coefficient 0.266, $P = 0.001$). Our HCWs generally had high

Table 3: Practice level of staff nurses regarding CLABSI care bundle *n*=125

Practice level	Frequency	Percentage
Good	10	8
Average	40	32
Poor	75	60

CLABSI: Central line-associated bloodstream infection

Table 4: Correlation between knowledge and practices regarding CLABSI care bundle among staff nurses *n*=125

Particulars	Correlation
Knowledge versus practices	r=0.7501

CLABSI: Central line-associated bloodstream infection

Table 5: Association between the level of knowledge score with the selected demographic variables *n*=125

Socio-demographic variables	Total no. Of samples	Level of knowledge score			Df	*P*-value	χ^2 value	Result
		Adequate	Moderate	Inadequate				
Age					6	0.8197	2.91316	NS
20–29 years	83	5	24	54				
30–39 years	24	2	10	12				
40–49 years	15	1	3	11				
50 years and above	3	0	1	2				
Gender					2	0.4513	1.5911	NS
Male	15	2	5	8				
Female	110	6	33	71				
Educational qualification					4	0.7021	2.183111	NS
GNM	61	2	20	39				
B.Bsc (N)	39	4	11	24				
P.B.Bsc (N)	25	2	7	16				
M.sc (N)	0	0	0	0				
Year of experience					6	0.952	1.6075	NS
<1 year	30	1	10	19				
1–5 years	65	5	19	41				
6–10 years	25	2	8	15				
More than 10 years	5	0	1	4				
Have you heard about CLABSI care bundle					2	0.4276	1.6989	NS
Yes	120	7	37	76				
No	5	1	1	3				
Are you aware of the elements of the CLABSI care bundle					2	0.7457	0.586974	NS
Yes	124	8	38	78				
No	1	0	0	1				
Do you utilize the CLABSI care bundle in your unit					2	0.7457	0.586974	NS
Yes	124	8	38	78				
No	1	0	0	1				
Have you completed any training program associated with CLABSI care bundle					2	0.3912	1.87693	NS
Yes	109	6	32	71				
No	16	2	6	8				

CLABSI: Central line-associated bloodstream infection

Table 6: Association between the level of practices level with the selected demographic variables *n*=125

Socio-demographic variables	Total no. Of samples	Level of practice score			Df	*P*-value	χ^2 value	Result
		Good	Average	Poor				
Age					6	0.7155	3.71252	NS
20–29 years	83	6	23	54				
30–39 years	24	3	10	11				
40–49 years	15	1	6	8				
50 years and above	3	0	1	2				
Gender					2	0.08004	5.05	NS
Male	15	3	2	10				
Female	110	7	38	65				
Educational qualification					4	0.9783	0.4483	NS
GNM	61	4	20	37				
B.Bsc (N)	39	4	12	23				
P.B.Bsc (N)	25	2	8	15				
M.sc (N)	0	0	0	0				
Year of experience					6	0.592	4.63045	NS
<1 year	30	2	13	15				
1–5 years	65	5	21	39				
6–10 years	25	2	5	18				
More than 10 years	5	1	1	3				
Have you heard about CLABSI care bundle					2	0.02667	7.2482	**S**
Yes	120	8	39	73				
No	5	2	1	2				
Are you aware of the elements of the CLABSI care bundle					2	0.7146	0.6720	NS
Yes	124	10	40	74				
No	1	0	0	1				
Do you utilize the CLABSI care bundle in your unit					2	0.7146	0.6720	NS
Yes	124	10	40	74				
No	1	0	0	1				
Have you completed any training program associated with CLABSI care bundle					2	0.2277	2.9595	NS
Yes	109	7	35	67				
No	16	3	5	8				

CLABSI: Central line-associated bloodstream infection

levels of knowledge and compliance with the central line bundle. The knowledge of the central line bundle can be improved by training. Future teaching initiatives ought to concentrate on certain compliance shortcomings like changing one's clothes and using the subclavian site.[9]

Kurian and John to determine the extent of the knowledge of nurses at a particular hospital in Delhi concerning CLABSI, this study was carried out at one of those hospitals, a study was carried out with the goal of developing an information booklet on CLABSI prevention. The findings demonstrated that the overwhelming number of staff nurses (96%) possessed insufficient expertise, while only 4% possessed good knowledge. As a result, it can be argued that the bulk of the hospital's staff nurses is unprepared for CLABSI.[10]

Conclusion

The research led to the conclusion that staff nurses had, on average, acceptable knowledge and practices about the treatment package for central line-related bloodstream infections. The researcher suggests that by disseminating the multi-modular learning tool addressing the care bundle for central line-associated bloodstream infections, both knowledge and practices would be improved.

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Conflict of Interest

None.

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