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Assess The Practice And Perceived Barriers Of Staff Nurses In Adopting Protocol On Post Insertion Care Bundle In Central Line Associated Blood Stream Infection In Selected Hospitals.

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ABSTRACT

Bloodstream infections are considered to be associated with a central line if the line was in use during the 48-hour period before the development of the bloodstream infection. Care bundles, in general, are groupings of best practices with respect to a disease process that individually improve care, but when applied together result in substantially greater improvement. The present study was conducted to assess the practice and perceived barriers of staff nurses working in ICU and CCU in adopting protocol on post insertion care bundle in prevention of central line associated blood stream infection in selected hospitals of Indore. The study used descriptive research design. Purposive sampling technique is used to select 50 staff nurses working in ICU and CCU as per the predetermined inclusion criteria. Selected samples were given the knowledge and barrier questionnaire regarding post insertion care bundle which was filled by the participants, an observational checklist is used to assess the practice of staff nurses. At the end samples were taught about CLABSI and its prevention and also post insertion care bundle protocol was given to sister incharge of ICU and CCU. The study finding reveals that there is a great need for the staff nurses to update their knowledge regarding post insertion care bundle for preventing CLABSI and providing post insertion care bundle while caring patients with central line catheter prevent fatal complication in ill patients.

Kerwords : Central Line Associated Blood Stream Infection, Post Insertion Care Bundle, Staff Nurses, Practice, Barrier

BACKGROUND

Catheter-related bloodstream infections (CR-BSIs) are defined as bacteremia,fungemia in a patient with an intravascular catheter with at least one positive blood culture obtained from a peripheral vein, clinical manifestations of infection (i.e., fever, chills, and/or hypotension), and no apparent source for the bloodstream infection except the catheter. Bloodstream infections are considered to be associated with a central line if the line was in use during the 48-hour period before the development of the bloodstream infection. If the time interval between the onset of infection and device use is greater than 48 hours, there should be compelling evidence that the infection is related to the central line (**Potter-Perry. Fundamental of Nursing , 2009**) [1]

An estimated 250,000 to 500,000 CLABSI occur in US hospitals each year CLABSI are an important cause of morbidity and excess cost of care for hospitalized patients. Studies of CLABSI that control for the underlying severity of illness suggest that the attributable mortality rate is 4% to 20%. Put another way, an estimated 500 to 4000 patients die annually from CLABSI in the United States, and the reported range for patient care cost attributed to CLABSI is $3700 to $29,000 per episode.**(CDC Guideline MMWR , Aug. 9 2002).** [2]

An article on Prevention of central venous catheter-related infection in the intensive care unit states that, prevention of catheter-related infection involves several measures which should be used in combination, like use of a checklist to guide catheter insertion and maintenance; adequate training of the nursing staff involved in the management of vascular access and an adequate patient-to-nurse ratio; the use of maximal sterile barrier precautions during catheter insertion; preference for a chlorhexidine-based solution for skin antisepsis; cleaning hands with an alcohol-based hand rub solution before any manipulation of the infusion line; and removing any useless catheters. Healthcare workers caring for a patient with a central venous access device need to be adequately trained, and assessed as being competent in using CVCs and adhering to infection prevention practices.(**Denis Frasca**,**et.al 2010).**[3]

1.2 NEED FOR THE STUDY

A catheter-associated bloodstream infection is serious, but often can be successfully treated with antibiotics. The catheter might need to be removed if you develop an infection. Central venous catheterization is commonly used in critically ill patients and may cause different complications, including infection **(MHA – KICU Infection Disease Advisory Group 2006).**[4]

A 2008 University Health System Consortium benchmarking study assessed 19 academic medical centers (719 patients with 1,032 central venous catheter insertions and 7,781 catheter days) for adherence with best practices to reduce CR-BSIs. Results showed a relatively high CR-BSI rate (7.07 per 1,000 catheter days). Compliance varied widely, and all centers performed poorly at providing evidence of adherence to

best practices.**(Coral Hatler, et al.Walk the Walk to Reduce Catheter-Related Bloodstream Infections).** [5]

Care "bundles" are groupings of best practices that pertain to a specific disease process. The Institute for Healthcare Improvement is one source for these bundles. Implementing all practices in the bundle together results in better outcomes than using the practices individually. The evidence supporting the bundle components is adequately established to be deemed a standard of care.**(Coral Hatler, et al.Walk the Walk to Reduce Catheter-Related Bloodstream Infections)** [5]

A study done at Rajiv Gandhi Cancer Institute New Delhi proved that major complications of central venous catheters are infection(1.27%),breakage/leakage (0.5%), dislodgement(0.31%) and occlusion(0.06%). **(M Pawar, Y Mehta. et. Al. 2006)**[6]

From the above cited literature we understand that handling CVC requires skill as well as the theoretical knowledge of CVC care. Hence I felt the need of conducting post insertion care bundle inorder to prevent central line associated blood stream infection.This would help the future nurses to gain adequate knowledge regarding safe handling of the Central Venous Device and prevent complication.

STATEMENT OF THE PROBLEM:

"A descriptive study to assess the practice and perceived barriers as expressed by nurses in adopting protocol on post insertion care bundle in prevention of central line associated blood stream infection in selected hospitals of Indore in the year 2023-2024".

OBJECTIVES OF THE STUDY

- To explore the current nursing practice adopted by the nurses while giving care to patients with central line.
- To identify the barriers in adoption of post insertion care bundle while giving care to patients with central line.
- To assess the knowledge of staff nurses regarding post insertion care bundle.
- To determine the association between central line associated blood stream infection and selected socio demographic variables of staff nurses.
- To identify the association between central line associated blood stream infection and clinical variables of patients with central line catheter (diagnosis, days on central line catheter, onset of CLABSI).

HYPOTHESIS

- **H**1. There is significant association between practice of nurses and selected demographic variables at the level of $p \leq 0.05$.
- **H**2. There is significant association between practice of nurses and selected clinical variables at the level of $p \leq 0.05$.

CONCEPTUAL FRAMEWORK

The conceptual framework in this study is based upon Imogene King's Goal Attainment Model with selfperception, communication, interaction and transaction.

RESEARCH METHODOLOGY

Research design : Descriptive research design

Population : Staff nurses working in ICU and CCU at Apollo Hospital

Sampling technique : Non probability purposive sampling

Sample size : 50

Setting : Apollo Hospital, Indore

Tool : The tool for data collection consist of four section

Section 1 : Sociodemographic variables of staff nurses

This session consist of 5 items for obtaining information about selected demographic variables such as age, professional qualification, professional experience,experience in caring for patients with central line catheter care, monthly income.

Section 2 : Clinical variables of patients with central line

It consists of 4 items for obtaining information about clinical parameters of the patients consist of days of central line insertion,onset of CLABSI days, system affected,site of catheter insertion.

Section 3 : Questionnaire regarding knowledge and barrier

This section consisted of a structured knowledge questionnaire (10) covering the questions regarding post insertion care bundle. Each item had four responses,and each item scored as 1. Open ended questions (5) to

collect data regarding barriers of staff nurses in adopting post insertion care bundle to prevent central line associated blood stream infection(CLABSI).

Score items refers to the level of knowledge to post insertion care bundle.

The total knowledge questionnaire was of 10 marks.

SCORING : A score of 0-2 is considered very poor knowledge, 3-4 score considered poor knowledge, 5-6 score indicated average knowledge, 7-8 score indicated good knowledge and 9-10 score considered excellent knowledge.

Scoring was done in accordance with suggestion of experts in medical surgical nursing.

Section 4 : Observational checklist for practice assessment

Observational checklist for practice assessment in prevention of central line associated blood stream infection included hand hygiene,site inspection,dressing,catheter injection ports, catheter access ,catheter replacement, administration set replacement. Each steps consists of always,sometimes and never options. Each item in always score 3 marks, sometimes score 2 marks and never score 1 mark. The total mark of observational checklist is 33.

SCORING : A score of 11- 18 considered practice is unsatisfactory, 19- 26 considered moderately satisfactory and 27 – 33 indicated satisfactory.

CONTENT VALIDITY AND RELIABILITY

A prepared tool along with objectives, hypothesis ,blueprint and criteria checklist was given to 7 experts from the field of medical surgical nursing and vascular surgery, intensivist, statistician for establishing content validity. It consisted of two criteria ‘agree’ and ‘disagree’. A remark column was provided for each item, where expert could give their suggestions/remarks.

The tool consisted of sociodemographic variables with 5 items, clinical variables of 4 items, knowledge and barrier questionnaire of 15 items and observational checklist of 11 items.

All tools were returned by the experts,with minor changes in section 2 and section 3 was discussed with the guide and minor changes were re-established.

To establish reliability, the tool was administered to 6 staff nurses working in ICU and CCU of Varma Union Hospital, Indore. Reliability of the tool was established by the split half method using karl

pearson's correlation formula. The reliability was found r = 0.87 for knowledge and barrier questionnaire and r = 0.98 for observational checklist which showed that the tool were reliable.

3.13 PILOT STUDY

The predominant objectives of the pilot study was to help the investigator to become familiar with the use of the tool and to find out any difficulties to conduct the main study. It also aimed to assess the feasibility of the study,clarity of language and make plans for analysis thus helping in finalizing the tool. The investigator obtained the written permission from the concerned authority. Pilot study was conducted from 27th February to 14th March 2023 in ICU and CCU of Apollo hospital, Indore.

Six staff nurses from ICU and CCU were given the structured knowledge questionnaire to fill the answers. Observation of the practice of staff nurses while caring patients with central line catheter was done with the help of observational checklist. An informed consent was obtained from the respondents prior to the study. The purpose of the study was explained to the subjects and confidentiality was assured to the entire subject. The average time taken for filling the knowledge questions was 15 minutes. Observation of the practice took about 5-8 minutes for each staff nurse. After filling the questionnaire the samples were taught about CLABSI and its prevention and also post insertion care bundle protocol was distributed to the sister incharges of ICU and CCU.

The analysis of the pilot study revealed the objectives of the study could be fullfilled. The study was found to be feasible and based on this information investigator proceeded for actual data collection for the main study.

3.14 PROCEDURE FOR DATA COLLECTION

Written permission was obtained from the administrative authority and research ethics committee of Apollo Hospital, Indore prior to the data collection. The study was carried out in the same way as that of the pilot study. A total of 50 samples was taken by the purposive sampling for the study. The actual data collection period was from 06.04.15 to 09.05.15. The procedure for data collection was divided into pre-procedure,procedure and post-procedure.

Pre-procedure

- Permission was taken from the hospital authority.
- Selection of the samples as per the inclusion criteria of the study was done.
- After taking the sample,procedure was explained to them.
- Informed written consent was taken from the samples.

Procedure

- The knowledge of staff nurses regarding post insertion care bundle was assessed with structured knowledge questionnaire.
- The barriers of staff nurses in adopting post insertion care bundle was assessed with open ended question.
- Observation of the practice of staff nurses while caring central line inserted patients was done with the observational checklist.
- Post insertion care bundle protocol and teaching about CLABSI and its prevention was given to the staff nurses.

Post procedure

- Nurses were encouraged to practice post insertion care bundle while caring central line inserted patients.
- Post insertion care bundle protocol was given to sister incharge of ICU and CCU.

5.1 MAJOR FINDINGS OF THE STUDY

1) Sociodemographic variables

- Regarding the sociodemographic variables 76% staffs were in the age group of 20-30 years while only 4% were above 40 years of age.
- Majority of the staff nurses were Bachelors in Science i.e., 56% while not less than 44% were GNM.
- Nearly half of the staff nurses 42% were having clinical experience more than 5 years while only 6% had less than 1 year of clinical experience.
- Majority of staff nurses 42% were having more than 5 years of experience in handling patients with central line catheter and only 6% had less than 1 year of experience.
- Concerning the monthly income 72% had a monthly income of 16,020 - 32,049 wherein only 6% had monthly income between 8010 - 12019.

2) Clinical variables

- Majority of the patients 48% were on central line inserted for 4-6 days whereas 18% were for more than 6 days.
- Majority of the patients i.e., 94% had no CLABSI while 2% developed it within 4-6 days.

- Out of the total samples 32% were diagnosed of cardiac disease and only 10% had gastrological problems.
- Absolutely all of the samples i.e., 100% had jugular vein insertion.

3) Association between practice of nurses with selected socio demographic variables of staff nurses.

- There is a significant association between practice of staff nurses and selected socio demographic variables such as professional experience and experience in caring for patients with central line catheter.
- There is no significant association between practice of staff nurses and selected socio demographic variables such as age and professional qualification.

4) Association between practice of nurses with selected clinical variables of patients with central line catheter.

- There is a significant association between practice of staff nurses and onset of CLABSI.
- There is no significant association between practice of staff nurses and selected clinical variables such as diagnosis and site of catheter insertion.

5) Knowledge score among staff nurses regarding post insertion care bundle

- 42% respondent scored poor grade, 34% scored average grade while an each of only 10% scored good as well as very poor grade wherein only 4% scored excellent.

6) Practice score of staff nurses regarding post insertion care bundle.

- A majority of 82% of staff nurses were found to be moderately satisfactory regarding the practice of post insertion care bundle while 14% were unsatisfactory and only 4% had satisfactory practice.

7) Open ended questionnaire regarding barriers of nurses in implementing post insertion care bundle.

- Majority of 56% staff nurses reported that there were barriers in implementing post insertion care bundle, whereas 44% said no to it.
- Majority 56% of the staff did not think that their hospital had any high incidence of CLABSI, while 44% answered yes to it.
- 30% of the staff nurses said they are provided with central line bundle checklist while the rest of 70% admitted no such thing being provided by the hospital for preventing CLABSI.

- 76% staff said they did not get any education or training programme for insertion and maintenance of central line, whereas 24% answered they got inservice education regarding prevention of catheter related blood stream infections.
- When asked for suggestions for effectively practicing post insertion care bundle 58% staffs said more inservice classes were needed on various topics like insertion and maintenance of catheter, catheter site care, handwashing as well as post insertion care bundle. 26% staffs suggested administrative remedies like proper nurse patient ratio in the ICU as per norms and quality supervision done by supervisor as well as quality check and infection control team. Handwashing area to be made accessible with handrub at every bedside was suggested by 6% staffs. Lastly 10% staffs suggested the best way would be to decrease staff burden by limiting paper work and fixing certain hours for physician rounds to save time which can be utilized for effective care.

DISCUSSION

The study intended to assess the practice and knowledge among staff nurses regarding post insertion care bundle and barriers while implementing post insertion care bundle. The findings of the present study have been discussed with the objectives,hypothesis and review of literature.

Association between practice of nurses with selected socio demographic variables of staff nurses.

The findings showed that there is no significance between practice of staff nurses and selected socio demographic variables such as age and professional qualification.

But there is a association between practice of staff nurses and selected socio demographic variables such as professional experience and experience in caring for patients with central line catheter(at df_6 χ^2 value = 12.61 and table value = 12.59).**Hence H_1** ie there is a significant association between practice of nurses with selected socio demographic variables of staff nurses at the level of $p \leq 0.05$ **was accepted**. The researcher regrets for not having any supportive study for this hypothesis.

Association between practice of nurses with selected clinical variables of patients with central line catheter.

The finding showed that there is no significance between practice of staff nurses and selected clinical variables such as diagnosis and site of catheter insertion.

But there is a association between practice of staff nurses and onset of CLABSI (at df_4 χ^2 value = 19.58 and table value = 9.49)**Hence H_2** ie there is a significant association between practice of nurses with selected clinical variables of patients with central line catheter at the level of $p \leq 0.05$ **was accepted**.

The above findings were supported with the study done on CRBSI prevention, and now a number of formal guidelines for prevention exist to help clinicians decide which strategies to adopt in their ICUs. Key recommendations include: improved hand hygiene, use of full-barrier drapes, skin preparation with chlorhexidine, site care with a semipermeable gauze, preferential use of the subclavian site, and consideration of antibiotic/antiseptic-impregnated catheters. Dr. Sessler observed that many ICUs have yet to fully implement these recommendation. Similarly, reliance on chlorhexidine rather than povidine can reduce the risk for CRBSIs by 50% and costs only a few extra pennies. Overall, chlorhexidine is hugely cost-effective. With respect to the employment of antiseptic-impregnated catheters, Dr. Sessler indicated that current recommendations suggest they should be adopted if the rate of CRBSI remains > 2% despite other preventive measures.

CONCLUSION

With the concluding phase of present study, the researcher felt that overall experience of the researcher was adventurous and fruitful.There was a constant and tireless effort of guide and co-guide throughout the study. Nursing as a profession is now responsible to account for its competence and performance. Outcome is mechanism to evaluate quality, improve effectiveness and link practices to professional accountability. Providing post insertion care bundle while caring patients with central line catheter prevent fatal complication in ill patients. The nurse plays an important role in monitoring the patient's progresses and has to make decision which is beneficial to the client's life. The results of the present study shows that there is a great need for the staff nurses to update their knowledge regarding post insertion care bundle for preventing CLABSI.

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