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Knowledge and Practice of Nurses Towards the Prevention of Postoperative Infection

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Abstract

Objectives: *This study was carried out to determine the level of nurse's knowledge and practice regarding postoperative infection prevention who work in the surgical departments of the military hospital in Sudan.*

Background: *Postoperative infection is known worldwide as one of the five several causes of harm to patients and preventable patient safety problem, also frequently described as a sign of the quality of care provided by health care organizations.*

Methods: *An institution-based cross-sectional survey was conducted among 122 nurses. A structured self-administered questionnaire was used for data collection. Data analysis was done using SPSS version 23. Statistical package. Descriptive statistics were used to describe the study population in relation to related variables.*

The results: *The analysis of knowledge scores of the total sample showed the participant knowledge level regarding postoperative infection prevention was poor based on their results only (37.6%) of the participants give correct answers. Regarding a practice, was found the nurses has a good practice about postoperative infection prevention, 63.2%. Some barriers have been found, such as insufficient knowledge, Staff shortage, inadequate facilities, equipment, and lack of a surveillance system.*

Conclusion: *Concluded that the nurse's working in a military hospital in Sudan that their knowledge regarding postoperative infection was found to be inadequate. Should the higher educational status, tending approved practice, being further encountered showed a positive and significant connection with knowledge. Whereas staff shortage, inadequate facilities, were found to be affected by the practice of postoperative infection prevention.*

The study recommended In-service practicing updating programs and ensuring the availability of the required equipment are some of the important steps to improve nurses' knowledge and practice.

Keywords: *Knowledge, Practice, Postoperative, Infection, Prevention.*

Introduction

Postoperative infection occurs after an invasive procedure, most postoperative infection occurs due to two main types (community-Acquired or Hospital-Acquired).there have many factors influencing postoperative infection surgical risk factors as a type of procedure, degree of contamination, duration of operation, urgency of operation, skin preparation and operating room environment (3) This infection can have serious impacts including prolonged hospital stay, decreased quality of life, and increased mortality, additional cost for patients and their family, and increasing health care fee (10, 21,22).

Postoperative infection is known worldwide as one of the five several causes of harm to patients and preventable patient safety problem, also frequently described as a sign of the quality of care provided by health care organizations. (7,18) Postoperative infection formerly indicates as wound infection is one of the most common causes of healthcare-related infection. (11) In reality, it becomes been suggested that the incidence of postoperative infections may be higher due to a poor state of health facilities. (16)

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Postoperative infections are the main cause of illness and a few frequent causes of death with surgical patients. (14).

This study aims to determine the Nurses' knowledge towards the prevention of postoperative infection and to determine the Nurses practice towards prevention of postoperative infection.

Research questions: The following are proposed research questions to guide the study: What is the Nurses knowledge level towards the prevention of postoperative infection? What are the nurses‟ practice level towards the prevention of postoperative infection? Does this study examine the knowledge and practices of nurses? Towards postoperative infection prevention in a military hospital, Sudan. The study will be helpful for me to improve my knowledge and practice for the prevention of postoperative infection during my clinical period. In addition, the research findings will allow the organization to develop education and build programs by identifying the lack of knowledge and practices of nurses towards the prevention of postoperative infection.

Methods

Design and study area

This a cross-sectional study was conducted among nurses working in a military hospital in Sudan located in Khartoum, the capital of Sudan, this hospital was providing outpatient and inpatient services for peoples living in this area. This hospital opens all day and receives the patient from a different setting in Sudan.

Study population

This consisted of One hundred and twenty-two Nurses who work in the surgical wards and operations room.

Sampling method

The sample of registered nurses was recruited by using a simple random sampling technique. The researcher selected lists among the nurses based on (inclusion and exclusion criteria) inclusion criteria: from different surgical sections inside the hospital. Male and female staff nurses of 25 years to 45 years of age, with at least 1-year job experience.

Exclusion criteria: Head nurses, student nurses, staff nurses with less than 20 years and more than 50 years of age, less than 1-year experience and nurses who refused to participate were excluded from the study

Data collection tool and procedure

Data were collected using the postoperative infection preventive Questionnaire. 23-item was used to identify nurses' knowledge and practices for postoperative infection Prevention after modifying the questionnaire.

Data analysis

Descriptive statistics were used to identify nurses' knowledge and practice of postoperative infection prevention. These included means, standard deviation, frequencies, and percentages. Statistical software and then exported to SPSS version 23. Odds Ratios and their 95% Confidence Intervals were computed and variables with the p-value of less than 0.05 were considered as significantly associated with the outcome variable.

Ethical considerations

Ethical approval was obtained from the Ministry of Health State Al-Khartoum city and permission letters were obtained from a military hospital, in Sudan. Before collecting data, written consent was obtained from participating nurses who were informed of the purpose and methods of the study. The

participants were also informed of their right to participate or withdraw at any time from the study. All data were kept anonymous and confidence was guaranteed by the use of a coding number. The recorded files of participants were archived securely.

Results

Table 1. Distribution of demographic characteristics of nurses (n =122)

Variables		Frequency	Percentage %
Sex	Male Female	48 74	39.3 60.7
Age in years	20 - 30 31 – 40 > 41	88 28 6	72.1 22.9 5.0
Level of education	Diploma in nursing Bachelor in nursing Master in nursing Ph.D. In nursing	62 39 14 7	50.8 32.0 11.5 5.7
Service experience	1 – 5 years 6 – 10 years < 10 years	98 20 4	80.3 16.4 3.3
Marital status	Single Married Divorced	79 40 3	64.7 32.8 2.5

Table 1. Shows the demographic details of the sample. The majority of the sample was females 60.7%, while males were 39.3%. The age of most nurses was between 20 and 30 years 72. 1%. Also, the majority had a bachelor degree of 75.4%, while other nurses had a master's degree of 11.5%. 80.3% who participated in this study had less than five years of clinical nursing experience. Twenty of nurses 16.4% had 6 – 10 years. While 3.3% had fewer ten years of clinical nursing experience. The majority of subjects 64.7% were single.

Table 2. Distribution of nurses' (Frequency and percentage) organizational factors (n =122)

Variables		Frequency Percentage (%)
Last Attend Training on Postoperative infection	Less than 1year 1-2 year More than 2 years Never attended	14 (11.5%) 8 (6.5%) 22 (18.0%) 78 (63.9%)
Guidelines on Postoperative infection	Yes No	31 (25.4%) 91 (74.6%)
Time for patients	Yes No	29 (23.8%) 93 (76.2%)
Staff shortage	Agree Disagree	58 (47.5%) 64 (52.5%)
Inadequate facilities and equipment's	Yes No	88 (72.1%) 34 (27.9%)

Table 2. Shows organizational factors for the prevention of postoperative infection majority 63.9% of the nurses had not received any formal training and 74.6% of them were not using any existing guidelines about risk assessment and prevention of postoperative infection. 76.2% They answered that there was

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little time to provide health care to the patient. More than half of the nurses 60.6% reported a staff shortage. The majority of nurses 72.1% agreed the hospital had inadequate facilities and equipment.

Table3. Distribution of Nurses' knowledge regarding Evidence-Based Guidelines for the prevention of postoperative infection. (N = 122)

	Correct N %	**Incorrect N %**	**Mean ± SD**	**p**	***t***	**95% Confidence Interval of the Difference**	
						Lower	**Upper**
Nurses' knowledge regarding Evidence-Based Guidelines for the prevention of postoperative infection	38 (31)	84 (68.9)	1.69 ± .47	0.00	-17.6	-.899	-.718

Table 3. Shows the result of the mean value of nurses correct knowledge regarding Evidence-Based Guidelines for the prevention of postoperative infection was 38 31 while the incorrect knowledge of the nurses was 84 68.9%, there is a significant difference ($P < 0.05$).

Table 4. Distribution of correct and incorrect answers regarding a Knowledge of postoperative infection prevention. (N = 122)

Nurses' knowledge regarding postoperative infection	**Correct N %**	**Incorrect N %**	**Mean ± SD**
1. Nurses' knowledge regarding a definition of postoperative infection.	24 (19.7)	98 (80.3)	1.80 ± .40
2. Nurses' knowledge regarding postoperative infection classifications.	53 (43.4)	69 (56.6)	1.57 ± .50
3. Nurses' knowledge regarding postoperative infection signs and symptoms.	83 (68.0)	39 (32.0)	1.32 ± .47
4. Nurses' knowledge regarding how to treatment of postoperative infection.	28 (23.0)	94 (77.0)	1.77 ± .42
5. Nurses' knowledge regarding how to a diagnosis of postoperative infection.	48 (39.30)	74 (60.7)	1.61 ± .49
6. Nurses' knowledge regarding Evidence-Based Guidelines for the prevention of postoperative infection.	38 (31.1)	84 (68.9)	1.69 ± .47
7. Nurses' knowledge regarding postoperative infection risk factors.	60 (49.2)	62 (50.8)	1.51 ± .50
8. Nurses' knowledge regarding the complication of postoperative infection.	33 (27.1)	89 (72.9)	1.73 ± .45

Table 4 illustrates the nurses' knowledge of postoperative prevention. Only 19.7% know about the definition of postoperative infection, while 80.3% of the participants gave the wrong answer. The participants of the study were asked about postoperative infection classifications for which 56.6% of the participants gives the wrong answer while only 43.4% of the participants give the right answer to this question. Although the majority 68.0% of the nurses has a good knowledge of postoperative infection signs and symptoms. But he found only 23.0% of the participants give the right answer about how to the treatment of postoperative infection and only 39.30% They know regarding a diagnosis of postoperative infection. Only 31.1 % of the participant They have knowledge about Evidence-Based Guidelines for the prevention of postoperative infection. The results showed that the nurses' knowledge level regarding complication of postoperative infection, was low only 27.1% of the participants give the right answer to this question.

Table 5. Frequency and percentage of Nurses practice of postoperative infection prevention (N=122)

Nurses practice on postoperative infection prevention	Never Practice N %	Sometimes Practice N %	Always Practice N %
1. I do the preoperative shaving to reduce the chance of postoperative infections.	40 (32.8)	6 (4.9)	76 (62.3)
2. I administer prophylactic antibiotics postoperatively on actual time for administering.	38 (31.1)	19 (15.6)	65 (53.3)
3. I do hand hygiene practice.	35 (28.7)	21 (17.2)	66 (54.1)
4. I use an antiseptic solution to "prep" the area around a surgical incision; maintaining sterility.	30 (24.6)	20 (16.4)	72 (59.0)
5. I advise my patient to preoperative showering.	27 (22.1)	25 (20.5)	70 (57.4)
6. I assess and monitor surgical site postoperatively to identify if bleeding occurs or not.	32 (26.2)	15 (12.3)	75 (61.5)
7. I sometimes use a topical cream for skin care for postoperative infection?	21 (17.2)	15 (12.3)	86 (70.5)
8. I document all data about the site of operation assessment.	17 (13.9)	20 (16.4)	85 (69.7)
9. I do change the surgical dressing postoperatively.	24 (19.7)	16 (13.1)	82 (67.2)
10. I perform a vital sign before wound dressing.	19 (15.6)	17 (13.9)	86 (70.5)
11. I identify common contributing factors to prevent postoperative infection.	22 (18.0)	12 (9.8)	88 (72.1)
12. I perform routine lab tests postoperatively.	33 (27.0)	15 (12.3)	74 (60.7)

Table 5. Shows that participants of the study: 41.0% of staff nurses never doing the preoperative shaving to reduce the chance of postoperative infections. 4.9% sometimes doing it, while 54.1% always practice. 39.3% of staff nurses never administer prophylactic antibiotics postoperatively on actual time for administering. 15.6% sometimes, while 45.1% always do this practice. 32.8% of staff nurses never doing hand hygiene practice, 25.4%, sometimes, 41.8% They always wash their hands before and after wound dressing and touching surgical site. 36.9% of the study participants never use an antiseptic solution to "prep" the area around a surgical incision; maintaining sterility, 16.4% sometimes, while 46.7% always do this practice. 38.5% of staff nurses never advise my patient to preoperative showering. 20.5 % sometimes, while 41.0% always advises. 34.4% of staff nurses never assess and monitor surgical site postoperatively to identify if bleeding occurs or not, 26.2% sometimes assess, while 39.3% always do this practice. 41.8% of study participants never use sometimes a topical cream for skin care for postoperative infection, 12.3% sometimes, while 45.9% always do this practice. 25.4% of staff nurses have never documented all data on the site of operation assessment, 31.1% sometimes document, while 43.4% always document data about the site of operation assessment. 36.1% of staff nurses never did change the surgical dressing postoperatively, 25.4% sometimes, while 38.5% always doing change the surgical dressing postoperatively. 38.5% of staff nurses never perform a vital sign before wound dressing, 20.5% sometimes, while 47.5% practice always. 42.6% of study participants never identify common contributing factors to prevent postoperative infection, 9.8% sometimes, while 47.5 always identify common contributing factors to prevent postoperative infection. 36.1% of staff nurses never perform routine lab tests postoperatively, 24.6% sometimes, while 39.3% always do this practice.

Discussion

Postoperative infection the most common types of hospital-acquired infections, and feedback regarding postoperative infection rates to staff has been associated with the improvement of the quality of nursing intervention. (1) Nurses play a major role since they are usually involved in each step around the clock.

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(5) Therefore, nurses need to have sufficient knowledge and practice about the prevention of postoperative infection.

The analysis of total knowledge scores of the total sample showed the participant knowledge level regarding postoperative infection prevention was poor based on their results only 37.6% of the participants Give correct answers. This finding is supported by several studies this claim was congruent with. (2) She believed that the poor level of nurses' knowledge regarding evidence-based guidelines for the prevention of postoperative infection considered as a significant obstacle to complying with the guidelines for the prevention of postoperative infection, which is risky on patient's safety and quality of care. And supported by Acaroglu R& Sicker HK. (19, 20) who conduct a study in Bangladesh, stated that nurse's knowledge is significantly affected by their qualification if nurses have a Bachelor degree or Master degree than they will manage and know the sign of infection well and prevent the patient from further complications. However, in a recent study that was conducted to evaluate nurses' knowledge of guidelines for preventing infections associated with peripheral venous catheters, it found that nurses' knowledge has been frequently low. It claimed that this low level of knowledge could be a potential risk factor for the patients. (4).

Regarding nurse's knowledge towards Evidence-Based Guidelines to the inhibition of postoperative infection. The study revealed the participants lacked knowledge relating to it. The findings of this research are similar to a study was conducted in Ethiopia, in which only 40.7% of the nurses were found to be knowledgeable about surgical site infection prevention. (22) Another study which was conducted in Nigeria, in which 68% of the nurses had also reported poor knowledge towards the prevention of postoperative wound infection. (6).

In this study, the scores that were shifted the data to a low level of knowledge could be attributed to many factors, the main important factors noticed were. Firstly, the results showed that the level of education for most of the participants in the current study was a diploma in nursing (50.8%), this result is similar to the study in which they were found the respondent's level of education was found to be significantly associated with knowledge of postoperative infection prevention. This finding is in line with the study conducted in Sweden among registered nurses and licensed practicum nurses in which the registered nurses' score was significantly higher than those of the licensed practicum nurses. (13).

The second main factor lack attended specific training courses about postoperative infection prevention, where 63.9% of study participants did not attend training courses regarding postoperative infection prevention. This result was congruent with reported that only 6% of three hundred and thirty-three nurses who work in surgical wards and operating theatre have had additional exposure to special training courses about surgical site infection prevention where the rest of the study sample 94% did not. (22).

Third main factor affects the knowledge scores, nursing experience 80.3% who participated in this study, they have experience of less than five years, this is one of the reasons for the lack of knowledge. There is a comparison between a similar study in Nigeria, where years of experience were significantly associated with clinical practice and knowledge. (8) Another study done in Spain on Nurses' knowledge and clinical practice of pressure ulcer care revealed that the greater the working experience the higher the knowledge gained. (16) The reason might be nurses with more years of working experience have more chance to work with different professionals so that they can learn from their coworker's experience. Staff shortage and inadequate facilities and equipment affect nurses to practice in this study half agreed to it. 47.5% a similar study conducted in England showed that the majority of the nurses reported a lack of staff and time as a barrier to implementing effective care practices. (12).

The results of this study refer to the overall nurses' practices regarding the prevention of postoperative infection of staff nurses for postoperative infection prevention were at a good level, the study's findings have revealed that nurses who always practiced postoperative infection prevention activities were found 63.2%. This result is supported by Joshi. (9) In India in which nurses' practice regarding surgical site infection prevention was also at a high level. The results are similar to a study which was conducted in

Ethiopia, in which nurses‟ practical activities regarding surgical site infection prevention were good. (22) On the other hand, this result is higher than the findings in a study done in Italy, where only 38% of the nurses were found to have always postoperative infection prevention practices. (17) The results of the study show that most staff of nurses were female, the highest percentage of participants fall in the age group of 20 - 30 years, which was more than 72.1 %, while the higher range of participants having the qualification of Diploma in nursing which was 50.8%, while regards to participants' marital status, the results showed that most of the participants were Single. 64.7% Furthermore, there were no statistically significant differences detected in nurses' knowledge regarding evidence-based guidelines for the prevention of postoperative infection with respect to gender, marital status, and age.

Limitations

There are two main limitations to the current study: Firstly, the samples of nurses came only from a military hospital in Sudan. Accordingly, the findings of this study may not represent the situation at all levels of hospitals in the country. Second, in addition, guidelines can change over time, thus, adaptation and re-evaluation of the instrument will be needed every time when newly published evidence for the prevention of postoperative infection is cited.

Conclusion

The findings demonstrated that a nurse's working in a military hospital in Sudan that their knowledge regarding the prevention of postoperative infection was found to be inadequate. It is noted that access to higher education, specialized training to avoid postoperative infection and continuous experience showed a positive and significant association with knowledge. Whereas staff shortage, inadequate facilities, and equipment were found to be affected by the practice of postoperative infection prevention.

Recommendation

The study recommended In-service practicing, updating programs and ensuring the availability of the required equipment are some of the important steps to improve nurses' knowledge and practice regarding postoperative infection prevention. Moreover, hospital administrators should encourage highly educated nurses to focus on implementing their knowledge into practice.

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