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The knowledge and practice of operating room nurses regarding sterile technique in a tertiary hospital, South India.

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Abstract:
Introduction*: Surgical site infection leads to prolonged hospital stay , which in turn escalates the cost of medical care. Appropriate and adequate surgery techniques followed in operating room can reduce the rate of surgical site infection. Knowledge of sterile technique and the appropriate precautions by the operating room nurses will enable nurses to prevent SSI.*
Aim: *To assess the knowledge and practice regarding sterile technique among OR nurses and associate nurses knowledge and practice regarding sterile technique and their selected demographic variables among OR nurses.*
Methodology: ***A*** *descriptive study was done to assess the knowledge and practice of sterile technique among nurses in the operating room of Christian Medical College, Vellore .A systematic random sampling technique was used to identify the samples. 64 samples were assessed. The instrument comprises of a knowledge questionnaire & a practice checklist developed by the investigator*
Results: *The study reveals that 6.25 % of them had excellent knowledge & majority (54.69%) of them had very good knowledge. Majority (68.75 %) of them had adequate practice. However it was observed that there is weak negative correlation between knowledge and practice(with a significance of p value 0.03, r = -0.27).This indicate the need for reinforcement & motivation to translate knowledge into practice. The study findings showed no significant association between demographic variable such as age ,gender , total experience and O.R experience.*
Conclusion: *The findings of the study highlight the need for periodic reinforcement and motivation of nurses needed as per the existing protocol. Since knowledge and practice of the nurses has a great impact on surgical infection rates, such a study was relevant and would guide the managers to carry out regular practice audits and plan interventions to improve their knowledge*
Keywords: *Knowledge, Practice, Sterile technique, Nurses, Operating Room, Demographic variables*

I. Introduction

Though the modern technology in surgery has improved, the surgical site infection is still one of the major concern for the peri operative team. The perioperative nurse's role is vital in preventing these infection by using sterile technique .

A study done at Boston (Reichman, James, & Greenberg, 2009) revealed that surgical site infection accounts for 15% of all nosocomial infections and the most common nosocomial infection among surgical patients. Post surgical infection can lead to increased length of post operative hospital stay, increased cost, increased rate of hospital re admissions. Sathyanarayana, Prashanth, Bhandare, and Kavyashree (2011) in their study of SSI in abdominal surgeries among 1000 patients reported that overall SSI rate was 13.7 %. SSI have been responsible for increase cost, morbidity and mortality related to surgery.

Perioperative nurses need to be knowledgeable and skillful regarding sterile technique and are responsible for identifying, interpreting, and implementing contemporary professional standards (Rothrock, 2007). Sterile techniques implies to methods by which contamination with microorganisms is prevented to maintain sterility throughout the surgical procedure (Berry & Kohn, 2013).

Association of perioperative Registered Nurses (AORN) has developed standards and recommended practices for perioperative patients that can serve as guidelines for measuring the quality of patient care. The principles of aseptic technique need to be followed by all sterile personnel in the operation theatre. Aseptic practices prevent and control the exposure of a surgical wound to operating theatre environment and personnel. The circulating nurse plays an important role in assisting surgical team and supervises practices to prevent SSI (Metsala, 2015).

A study done in England to assess the practice of aseptic technique among 21 nurses showed that not all nurses followed the aseptic technique (Bree-Williams & Waterman,1996). A similar study done in

Philippines among OR nurses reveal that 57.14% had excellent knowledge and no correlation was found between nurses knowledge and extent of practice (Leodoro et al., 2012).

Thus nurses need to have good knowledge about aseptic practices which will in turn reduce the cost, morbidity and mortality related to surgery. Hence a descriptive study was done to assess the knowledge and practice of sterile technique among nurses in the operating room of Christian Medical College, Vellore .

Objectives

- To assess the knowledge regarding sterile technique among OR nurses.
- To assess the practice regarding sterile technique among OR nurses.
- To correlate knowledge and practice regarding sterile technique among OR nurses.
- To associate nurses knowledge and practice regarding sterile technique and their selected demographic variables among OR nurses.

II. Methodology

A systematic random sampling technique was used to select subjects who were willing to participate, who scrub for the operations and those not on long leave. The instrument comprised of a knowledge questionnaire & a practice checklist developed by the investigator. All nurses working in OR – staff nurses (B.Sc., GNM) &ANM were included in this study.

The sample size was estimated with the mean knowledge score of 8 with standard deviation of 6 at 5% precision and 95% confidence interval. The feasibility of the instrument was studied on 10 subjects and the findings were used to calculate the sample size. A staff name list was prepared considering the availability of nurses at the time of data collection fulfilling the sampling criteria. Out of 287 nurses 200 nurses were included in the sampling frame work and every third nurse was chosen for the study. This study was conducted in the adult OR, Paediatric OR, Day Care OR and septic OR of Christian Medical College, Vellore.

Ethical consideration:

The approval from research committee of College of Nursing was obtained. Permission from the Nursing Superintendent, Head of nursing and medical in OR was obtained. The general informed consent was obtained from all the staff working in OR. The confidentiality and legal rights of the participants were protected.

Instrument: The instrument comprised of three sections. **Section I** was of the demographic profile of the participants such as age, gender, qualification, total experience and OR experience**. Section II** included knowledge questionnaire prepared by the investigator. It had 15 questions related to sterile technique. Participants were asked to indicate their answers by circling appropriate options. Each right answer had a score of **1** and every wrong answer a score of **0**.The total score was15 which was converted to percentage and interpreted as follows.

90 to 100% - Excellent
80 to 89 %-Very Good
70 to 79 %- Good
60 to 69 %- Fair
< 60 %- Poor

Section III was an observational check list prepared by the investigator to evaluate the practice of sterile technique. This observational checklist consisted of 21 items with scoring of 1 for '**yes'** and 0 for **'no'.** The total score was 21which was interpreted as adequate (>85%) and inadequate(<85%). A pilot study was done on 10 subjects to check the feasibility of the study and minor modifications were made as an outcome. Questionnaire and observation checklist were validated by four nursing and medical experts in the field of peri operative care.

Data collection:

The practice of the nurse was observed using checklist over a period of 2 months to achieve the required sample size. Following which the demographic variable and the knowledge questionnaire were administered by the investigator in two consecutive shifts (B & C duty) on the same day. The investigator ensured that the questionnaire was administered separately to prevent contamination.

Data analysis:

Descriptive and inferential statistics were utilized to analyze the data. Descriptive statistics include frequency, percentage, mean and standard deviation. Pearson correlation coefficient was used to explore relation between knowledge and practice as well as relation with age. Spearman correlation was used for total experience and operation room experience.

III. Results and Discussion

The respondents age ranged from 21 to 49 years old with a mean age of 31.14 and standard deviation of 6.23. About 85.94% of them were female and 14.06% were male. Majority of the participants were General Nurse Midwife (90.63%). 4.69% were BSc(N) and 4.69%were ANM.

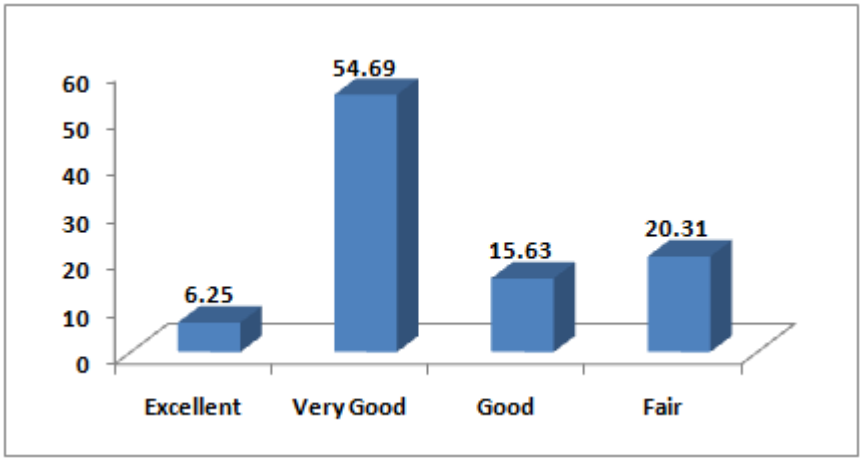
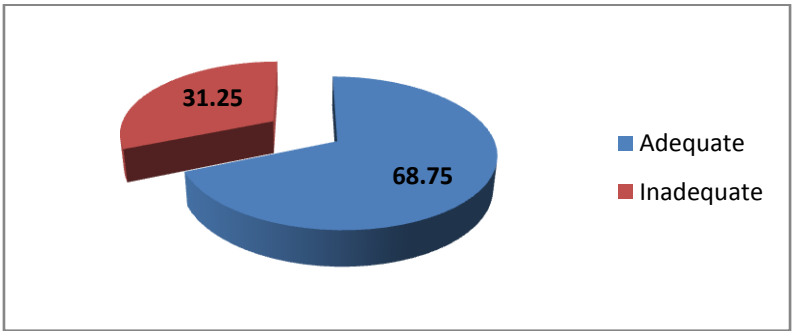


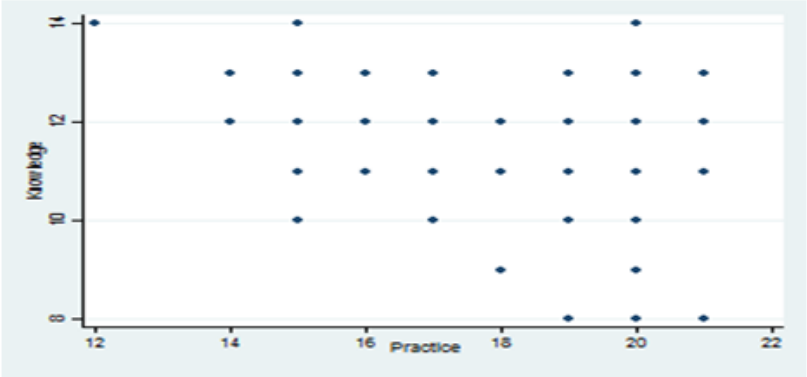
Figure1. Knowledge of nurses regarding sterile technique

Figure 1 shows that 6.25 % of them had excellent knowledge & majority(54.69%) of them had very good knowledge regarding sterile technique among nurses in OR. A similar study done by Leodoro et al in Philippines among OR nurses reveal that there is no correlation was found between nurses knowledge and extent of practice which is similar. A phenomenographic study by Davey JG explored understandings about aseptic technique held by second year undergraduate nurses. Data analysis revealed a range of understandings about aseptic technique from simple to complex.



Figur *2.* Practice of nurses regarding sterile technique

Figure 2 reveals that majority (68.75 %) of them had adequate practice regarding sterile technique. A study done by Bree-Williams & Waterman in England to assess the practice of aseptic technique among 21 nurses showed that there is a significant correlation which is similar to this study.



Figur 3. Correlation of knowledge and practice of nurses regarding sterile technique

Figure 3 reveals that there is a weak negative correlation between knowledge and practice (with a significance of p value 0.03, r = -0.27). Associate nurses knowledge and practice reveals that there is no associate between nurses knowledge and practice regarding sterile technique and their selected demographic variables: A study conducted by Unsworth and Collins by using a mixture of non-participant observation and individual semi-structured interviews to examine adherence to the principles of the aseptic technique among the district nurses reveals that there is a significant correlation which is similar

IV. Conclusion

The findings of the study highlights the need for periodic reinforcement and motivation of nurses needed in practice of sterile technique as per the existing protocol. Since knowledge & practice of the nurses has a great impact on surgical infection rates, such a study was relevant and would guide the managers to carry out regular practice audits and plan interventions to improve their knowledge and practice. It is vital for the surgical team members to develop a strong surgical conscience, adhering to the principles of asepsis and rectifying any improper technique witnessed in the operating room. Proper surgical attire plays an important role in the reduction of surgical site infections by reducing the amount of hair and skin contaminants reaching the sterile field.

Limitation of the study: The investigator observes the practices of a scrub nurse for the first one hour of surgery and assumes that the nurse follows the same throughout the surgery.

Disclosure of conflict of interest: This study was done as a faculty research and was funded by the College of Nursing.

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