

The Effect of Educational Program on Knowledge, Attitude and Practice on Sterile Technique among Operating Room Nurses of a Private Hospital in Selangor

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ABSTRACT

Surgical site infection continues to be the most common hospital-acquired infection among operated patients, associated with expenses, mortality, and morbidity. Operating room nurses play a big role in preventing and controlling theatre infection by applying sterile technique principles. For that reason, the Operating Room nurses, to accomplish their tasks, must have the knowledge and good attitude to practice the sterile technique. However, various studies revealed that OR nurses have insufficient knowledge, attitude and practice of sterile technique. This study aimed identify the effect of educational programs towards enhancing operating room nurses' knowledge, attitude and practice of sterile technique in two KPJ Hospitals. The research design chosen in this study was Quasi-experimental, where an educational program was conducted as an intervention on a single group pre and posttest. A total of 48 Registered Nurses working in the Operating Room of the two selected Hospitals in Selangor were recruited to use purposive samples. The sample from the Registered Nurses population was selected using the Convenience sampling method. The data were analyzed using the IBM Social Packages for the Social Sciences (SPSS) version 26. The finding of this study revealed that 1 (2.3%) of respondents had low knowledge while 17 (39.5%) had a medium level of knowledge, and 25 (58.1%) had a high level of knowledge for pre-intervention. Post-intervention respondents had medium knowledge, 8 (18.6%) and 35 (81.4%) for high knowledge. There is still a need for nurses to be better educated on the principles of sterile techniques to ensure the operated patient's safety and reduce the rate of postoperative wound infection among the operated patient.

Keywords

Surgical site infection, Sterile technique, Operating room registered nurses, Knowledge, Attitudes, Practices.

Introduction

The Operating Room (OR) is considered one of the hospital's high-risk areas with high infection and mortality rates. Thus, perioperative nurses' compliance and knowledge of mechanisms to reduce this risk, Universal Standard precautions are significant and directly affect patient and Health Care Workers (HCW) safety

[1]. The association of peri Operative Registered Nurses (AORN) has developed recommended standards and practices for its perioperative patients can be a guideline for measuring the quality of patient care. All sterile staff in the operating room should follow the aseptic principle of the technique [2]. Operating room nurses play a major role in preventing and controlling SSI by using sterile techniques while rubbing and circulating. Nurses are vigilant to catch any breaks, which others may not see during surgery [3]. Thus, the OR nurses must be knowledgeable and skilled in sterile techniques for identifying, interpreting, and implementing

contemporary professional standards. Sterile techniques are methods used by healthcare workers to prevent contamination of sterile instruments or sterile areas during surgical procedures [3]. The perioperative registered room nurses' adherence to strict aseptic principles, careful observation of sterile technique and thorough antimicrobial preparation of the patient and the operative site is essential to minimize the risk of postoperative wound infection. The perioperative registered nurse evaluates the patient's vulnerability to infection, classifies the wound on the intraoperative record, implements sterile technique, protects the patients from Healthcare Associated Infection (HAI), collaborates in the administration of antibiotic prophylaxis and performs other responsibilities to create and control the environment of care [4]. The HCWs should scrub their hand with the appropriate product before donning sterile gloves [5]. In addition, the panel suggests that sterile disposal of non-woven, reusable woven drapes and gowns must be used during operations to avoid Surgical Site Infections (SSI).

Methodology

Design and Sampling

This quasi-experimental study was conducted in 2021 at two selected private hospitals in Selangor, Malaysia. The study population (N=48) were Registered Nurses working in the OR of the two selected Hospitals. The sampling method used in this study was purposive sampling conducted as an intervention on a single group pre and post-test post test on including and excluding criteria. Based on, Krejcie [6], for a population of 48 operating room registered nurses (N=48), the sample in this study is 43 registered nurses (S=43). This pretest-posttest study measured changes in OR registered nurses' knowledge, attitudes and practice towards sterile technique before and after delivering a brief sterile technique education. The study participants were nurses working in KPJ Selangor and KPJ Bandar Baru Klang Hospital.

Instruments

The researchers used questionnaires adapted from other similar studies conducted on knowledge, attitudes and practices of sterile techniques in health facilities, and the questionnaire was adapted based on the research questions and objectives as objectives. This study is different from the previous study. The questionnaire had five sections questionnaires in gathering data Pre & Post Test. The section was composed of the social demographic of the participants, including age, gender, level of education and year of working experience.

Section B was designed to assess the operating room nurses' knowledge regarding sterile technique. It had 12 multiple-choice questions. The score ranged from 0-12, and the score obtained was transformed into a percentage. The higher scores indicated a higher level of knowledge, and then the research transformed scores 22 into five levels of knowledge according to Mc. Donald, 2002 as follows: the respondents who had scores <60% were classified as having a very low level of knowledge, 60-69.99%: low; 70-89%: moderate level and 90-100:high level of knowledge of sterile technique. The higher score showed the great knowledge about the sterile technique the participant had.

Section C was designed to assess the attitude of operating room nurses' attitude towards sterile technique; it includes ten questions. It was scored using 5-point rating scale of 15 comparing their mean values with a central mean of 3; this was obtained using strongly agreed (5), agreed (5), neutral (3), disagreed (2) and strongly disagreed: $(5+4+3+2+1)/5=3$. A mean of above 3 to the attitudinal statements showed that the respondent had a positive attitude, while a score below 3 showed that the respondent had a negative attitude to the attitudinal statements.

Section D was used to assess the practice of the sterile technique; it had 12 questions where the respondents answered yes if he or they practised the given question regarding the practice of sterile technique and No if he/she did not practice the given question regarding the practice of sterile technique. The score ranged from 0-12, and the score obtained was transformed into a percentage. The higher scores indicated a higher level of practice of sterile technique, and then the research transformed scores into five levels of practice as follows: the respondents who had scores <60% were classified as having a very low level of knowledge, 60-69.99%: low; 70-89%: moderate level and 90-100:high level of practice of sterile technique.

Validity of the Instruments

Validity refers to the degree to which an instrument measures what it is supposed to measure, and it refers to whether the instrument measures the actual concept in question and whether the concept is measured accurately [7]. The validity consists of two parts, which are content validity and face validity. Face validity refers to whether the instrument is visible or it looks as if it measures the appropriate. Content validity was performed to ensure the questions were relevant and that the structure of the questionnaire was in logical order. Content validity is established based on judgments and experts make judgments as to whether the instrument covers aspects, which form the concept [8]. The researcher ensured the validity of the contents of the instrument with a consultant specialist in operating room techniques. The Hospital Nursing in charge reviewed the questionnaire adopted by researchers on other studies and literature based on sterile techniques, principle adjustments, and regrouping of questions were made.

Sterile Technique Education Program

This brief sterile technique program included four hours of interactive learning sessions directed towards operating room registered nurses working in two private hospitals of Klang Valley. This program was conducted in the operating room and assisted by an assistant unit manager and infection control link nurse. The program consisted of a formal lecture and group discussions about the sterile technique. Materials and case studies were taken from 13 Principles of Aseptic Technique in Operating Room. After the session, short videos of the sterile technique were also provided for 10 minutes. This video adopted the contents from "The Sterile Field in the Operating Room (Don't Touch That, Son!)" from the University of Alberta Faculty of Medicine and

Dentistry and produced its video [9]. To ensure maximum benefits, a sterile technique was practised and discussed within the group. Nurses participating in the program were divided into two groups according to their convenience at different times. At the end of the session, each participant was given a notebook, which included all information, guidelines, and practices delivered in the program.

Ethical Considerations

Ethical clearance was obtained from the University's affiliated Research Management Committee (RMC). The proposal for this study was reviewed and approved by the RMC. The purpose of the study, informed consent and respondents' criteria regarding privacy and confidentiality are attached and explained briefly in the google form.

Results

The highest percentage, 36 (83.7%) of the respondents, were female, 31 (72.1%) the majority of respondents were married, 15 (34.9%) the age group 25-30 years, 52 (65%) were female. Most 36 (83.7%) respondents had a diploma/Technical school certificate, and 15 (34.9%) had experience of 1 to 3 years. The results are shown in Table 1.

Table 1: Analysis of Demographic Characteristics of Operating Room Nurses (n=43).

Variables	Frequency	Percentage (%)
Gender		
Male	7	16.3
Female	36	83.7
Marital Status		
Single	12	27.9
Married	31	72.1
Age Categories		
18-24	8	18.6
25-30	15	34.9
31-34	12	27.9
>35	8	18.6
Highest Education Level		
Diploma/Technical school certificate	36	83.7
Bachelor's degree	7	16.3
Working Experience		
1 – 3	15	34.9
4 – 6	11	25.6
7 – 9	3	7.0
>10	14	32.6

Operating Room nurses' knowledge of sterile techniques for pre and post-intervention. 1 (2.3%) of respondents had low knowledge, while 17 (39.5%) had a medium level of knowledge, and 25 (58.1%) had a high level of knowledge for pre-intervention. Post-intervention respondents had medium knowledge, 8 (18.6%) and 35 (81.4%) for a high level of knowledge (Figure 1).

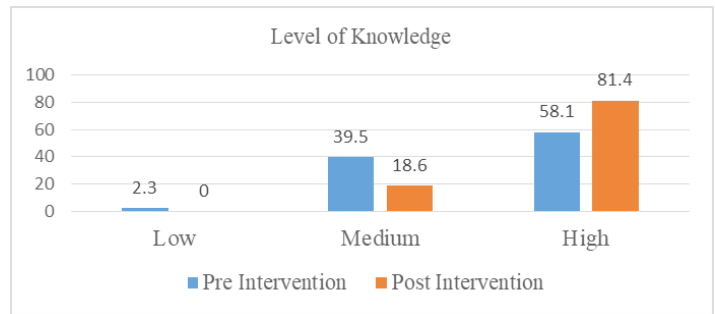


Figure 1: Level of Knowledge of Operating Room Nurses Regarding Sterile Technique.

Table 2: Distribution attitude on sterile techniques n=43.

Statement	Mean/SD Pretest	Mean/SD Post-test
1. Sterile personnel touch only sterile items or areas; unsterile personnel touch only unsterile items or areas	4.72 (0.7)	4.91 (0.29)
2. Sterile personnel must wear sterile gowns and gloves.	4.77 (0.71)	4.93 (0.25)
3. Self-gowning and gloving should be done from a separate sterile surface to avoid dripping water onto sterile supplies or a sterile table.	4.44 (1.1)	4.51 (0.85)
4. The stockinet cuffs of the gown are enclosed beneath sterile gloves	4.49 (0.82)	4.42 (0.98)
5. Sterile people must keep their hands in sight at all times and at or above waist level or the level of the sterile field	4.67 (0.80)	4.74 (0.69)
6. The back of the gown is considered	4.49 (1.03)	4.44 (0.95)
Gowns are considered sterile only from the chest to the level of the sterile field in the front and from 5cm above the elbows.	4.58 (1.0)	4.81 (0.45)
8. The unsterile circulating nurse does not directly contact the sterile field.	4.67 (0.89)	4.95 (0.21)
9. Sterile areas are continuously kept in view	4.72 (0.82)	4.83 (0.48)
10. The outer packaging of the sterile pack is opened and contents are removed using a sliding action, ensuring that the inner pack is not touched.	4.4 (1.0)	4.77 (0.52)

Table 3: Comparison of attitude before and after the training.

	Mean	Std. Deviation	Pearson Correlation Sig. (2-tailed)
Pre-test _attitude	4.59	.13227	.534
Post-test Posttest attitude	4.73	.20207	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The attitude of Operating Room Nurses towards pre and post-test posttest of the sterile technique in two private hospitals was analyzed using the paired t-test. The findings suggested there is no significant difference in the pretest and post-test scores with a p-value of >0.05 (Table 3).

Table 4 analysis showed pre and post test results for practice towards sterile technique among operating room nurses in two KPJ hospitals in Selangor. All the respondents practiced sterile technique during procedures. Wear a gown, gloves and mask during assisting surgery pre and post-test given. An increase in

respondents from 93% to 95.3% considered items of doubtful sterility to be contaminated. It also increased from 83.7% to 97.7% touch anywhere on the sterile gown. Minimizing movement within or around a sterile field increased from 97.7% to 100%.

Table 4: Practice of sterile technique among operating room nurses (n=43).

Do you practice sterile technique?	No	0 (0%)	0 (0%)
	Yes	43 (100%)	43 (100%)
Do you practice sterile techniques every time during the procedure?	No	0 (0%)	0 (0%)
	Yes	43 (100%)	43 (100%)
Do you check to see if the materials are sterile before use?	No	0 (0%)	0 (0%)
	Yes	43 (100%)	43 (100%)
Do you wear a gown, gloves and mask during assisting surgery?	No	0 (0%)	0 (0%)
	Yes	43 (100%)	43 (100%)
Do you use only sterile items within the sterile field?	No	0 (0%)	1 (2.3%)
	Yes	43 (100%)	42 (97.7%)
Do you consider items of doubtful sterility to be contaminated?	No	3 (7%)	2 (4.7%)
	Yes	40 (93%)	41 (95.3%)
Do you touch anywhere on the sterile gown?	No	7 (16.3%)	1 (2.3%)
	Yes	36 (83.7%)	42 (97.7%)
As a sterile person, do you touch only sterile items or areas?	No	1 (2.3%)	1 (2.3%)
	Yes	42 (97.7%)	42 (97.7%)
As an unsterile person, do you touch only unsterile items or areas?	No	2 (4.7%)	2 (4.7%)
	Yes	41 (95.3%)	41 (95.3%)
Do you minimize movement within or around a sterile field?	No	1 (2.3%)	0 (0%)
	Yes	42 (97.7%)	43 (100%)
Do you scrub your hands every time before assisting with surgical procedures or invasive procedures?	No	0 (0%)	0 (0%)
	Yes	43 (100%)	43 (100%)
Do you keep the hand held above the elbow during surgical hand washing	No	0 (0%)	2 (4.7%)
	Yes	43 (100%)	41 (95.3%)

Table 4 shows the pre and post-test results for attitudes towards sterile technique among operating room nurses in two KPJ hospitals in Selangor.

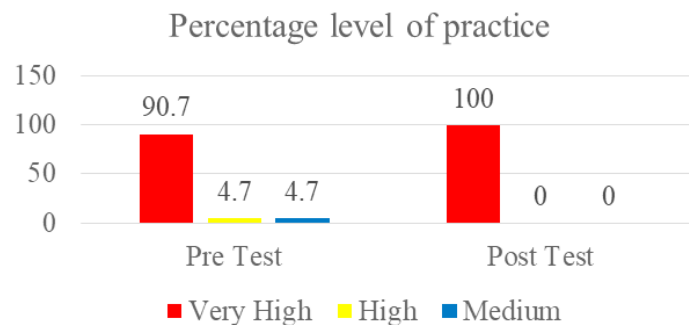


Figure 2: Analysis level of Practice towards Sterile Technique.

The level of practice was divided into three levels; i) very high practice with a score of 90 -100%, ii) high practice with a score of 80 – 89%, and iii) medium practice with a score of 70 – 79%. Of 43 respondents, 39 (90.7%) scored very high for practice, 2 (4.7%) high practice and 2 (4.7%) medium practice score for the pretest. All the respondents scored very high for practice in the post test (Figure 2).

Discussion

The Level of Knowledge Pre and Post-Educational Programs towards Sterile Technique

The results indicated that 25 (58.1%) had a high level of knowledge of pre-intervention. The majority of operating room nurses had high knowledge of post-educational training (35, 81.4%). The operating room nurse must have a high level of knowledge to provide safe and effective nursing care to the surgical client. The finding contradicts a study by Dhakal, Angadi & Lopchan [10], which revealed that more than half of the participants, 62 had a high knowledge of the aseptic technique, and 37.5% had average knowledge. None of the respondents had insufficient knowledge of the aseptic technique, whereas the majority of the respondents, (57.14%), had excellent knowledge of the sterile technique, and 38.09% had very good knowledge of the sterile technique [11]. However, the result of this study agrees with the previous studies conducted among nurses and other clinicians regarding knowledge of aseptic techniques and standard precautions in the hospital setting.

The Practice of Pre and Post-Educational Programs towards Sterile Technique

Regarding sterile gowns, 36 (83.7%) respondents answered that from chest level to the level of the sterile field and 5 cm above elbows to the cuffs of the sleeves is considered sterile which is, which is inconsistent with the same study done by Dhakal, Angadi & Lopchan, (2016). Concerning the practice of the sterile technique, the majority of respondents, 40 (93%), practised all criteria of the sterile technique for post-educational training and 32 (74.4%) for pre-educational training. This finding is contrary to Labrague [11]. The study, which revealed that the respondents had a great practice of sterile technique.

Limitation and Recommendation

The researchers encountered some problems and limitations during the implementation of this research. Sample size and sampling the methods used in this study limited the generalization of the findings. Some of the participants did not return the prepared questionnaires. This prompted the researcher to redistribute the questionnaire elsewhere to have a sample size.

Conclusion

In this study, operating room nurses have good knowledge, attitude and perception towards the sterile technique. The study was designed to identify the educational program's effect on enhancing operating room nurses' knowledge, attitude and practice of sterile technique in two KPJ Hospitals. Most respondents had a moderate knowledge of sterile techniques, the right attitude towards sterile techniques and good practice of sterile techniques. In addition, this study's findings revealed statistically significant differences in the relationship between the level of knowledge and age, experience, level of education and formal training on sterile techniques. However, there is still a need for nurses to be better educated on the principles of sterile techniques to ensure the operated patient's safety and reduce the rate of postoperative wound infection among the operated patient.

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