



## Original Article

## Effect of Nursing Intervention regarding Centers for Disease Control and Prevention Guidelines on Nursing Knowledge in Operating Room

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## ABSTRACT

Sterilization techniques are the basic and important responsibility of health care professional's especially nurses. **Objective:** To evaluate effect of intervention CDC guidelines on nurses' knowledge regarding Aseptic techniques in operating room. **Methods:** A quasi experimental study was conducted on 46 male and female nurses working in the operating room and having experience in operating room more than six months. A random sampling technique was used for data collection. The questionnaire consists of 22 questions about the knowledge of nurses regarding sterile techniques. Nurses were given 3-month intervention regarding aseptic technique, pre and post data was gathered from nurses regarding sterile techniques in operating rooms. Data were entered and analyzed in SPSS version 24. For quantitative variables mean and SD was computed. For categorical variables frequency and percentages was computed.  $p$ -value  $\leq 0.05$  was considered statistically significant. **Results:** The majority of nurses were married and female and 32 (69.6%) were between the age group 25-35 years. In the post-intervention phase there were 0(0), 21(45.7%) and 25(54.3%) participants had poor, fair and good knowledge respectively regarding aseptic techniques in operating room. The findings revealed that there was a significant difference between pre and post interventional practice scores as evident by ( $p$ -value  $< 0.001$ ). **Conclusion:** The current study concluded that the educational interventions on operation room nurses significantly enhance operating room nurses' knowledge regarding aseptic techniques.

## INTRODUCTION

Sterilization techniques are the basic and important responsibility of health care professionals especially nurses [1]. The basic effect of unsterile techniques is delayed outcome and prolonged hospital stay due to infection [2]. Approximately, 1.7 million patients in hospitals were admitted to hospitals for treatment acquire healthcare-associated infections. They further reported that almost 98,000 patients die due to these infections. Infection due to unsterile techniques in hospitals is the main source of infection [3]. According to center for disease control 1.7 million infections are hospital acquired which is an associated factor for death [4]. The aseptic technique is practiced in operating rooms. The aseptic technique includes the usage of sterilized equipment's,

gloves and gowns [5]. The prevention of infection which sometimes leads to unnecessary complication arising from surgery the aseptic technique is very vital. Aseptic approaches are required for the applications of plant cell, tissue, and organ cultivation [6]. A study reported that the most important in maintaining sterility in the operation room is to maintain the environment and the equipment's neat and clean [7]. Pre-operative sterilization of the types of equipment should be carried out, proper gowns, masks, and gloves should be used to maintain the sterile field during operation [8]. The results revealed that for patient's safety nurses play significant role. It was concluded that operating room nurses must be well-prepared and demonstrate thorough knowledge and competence in the

field of sterilization and they should be sterile at all times to diminish the spread of potential microorganisms [9]. Furthermore, health care workers especially the nurses are the most valuable health care professionals in the operation room who have more contact with the patients and assisted the surgeons during the operations [10]. Nurses have the main responsibility to follow the aseptic technique and prevent the patients and health care individuals from contamination [11, 12]. The role of scrub nurses is very important to maintain the sterility of the equipment's, environment in the operation room to break the chain of infection transmission [13]. Also, the nurses have the responsibility to maintain the aseptic field and scrub the patient's site of incision using the proper standard techniques [14]. Nurses' knowledge is critical for effective infection prevention and control. Barriers to IPC compliance include unfamiliarity with CDC standards, lack of awareness of preventive indications in routine patient care, and the potential dangers of transmitting germs to patients. Therefore, it is necessary to give education on CDC guideline to improve the nurse's knowledge and practices about aseptic techniques. The objective of the current study is to evaluate effect of intervention CDC guidelines on nurses' knowledge regarding aseptic techniques in operating room.

## METHODS

After the approval of Institutional review board of University of Lahore, quasi experimental study was conducted on 46 male and female nurses working in the operating room and having experience in operating room more than six months. Sample size of 46 cases was calculated with 95% confidence interval, 7% margin of error. A random sampling technique was used for data collection. Data for the current study were collected using a validated questionnaire developed by Nsekambabaye Jean Pierre to assess the knowledge of nurses regarding aseptic techniques [15]. The questionnaire consists of 22 questions about the knowledge of nurses regarding sterile techniques. The knowledge score ranges from 0-29. The knowledge was assessed as Poor Knowledge = 0-49 % Fair Knowledge = 50-74 % Good Knowledge = 75-100%. Nurses were given 3-month intervention regarding aseptic technique, pre and post data were gathered from nurses regarding sterile techniques in operating rooms. Data were entered and analyzed in SPSS version 24. For quantitative variables mean and SD was computed. For categorical variables frequency and percentages was computed. To compare the effect of CDC guidelines on nurses' knowledge and practices regarding aseptic techniques in an operating room paired sample t-test/ Wilcoxon signed rank test was applied.  $p$ -value  $\leq 0.05$  was considered statistically significant.

## RESULTS

Out of 46 participants 32 (69.6%) were between the age group 25-35 years and 14(30.4%) were in the age between 36-50 years. Out of 46 participants, only 87.0% were married and remaining 13.0% were single (Table 1).

Marital Status	Frequency (%)
Married	40(87)
Single	6(13)
Total	46(100)

**Table 1:** Marital Status of the Study Participants

Table 2 showed the education of the participants, 60.9% of the participants had diploma nursing, 30.4% did BSN while 8.7% did Post RN.

Education	Frequency (%)
Diploma	28(60.9)
BSN	14(30.4)
Post RN	4(8.7)
Total	46(100)

**Table 2:** Education of the Study Participants

Table 3 shows that in the pre-interventional phase the majority of the participants (65.2%) had poor knowledge while only 34.8% participants had fair knowledge regarding aseptic techniques in operating room. Whereas in the post-intervention phase there were 0(0), 21(45.7%) and 25(54.3%) participants had poor, fair and good knowledge respectively regarding aseptic techniques in operating room. The findings revealed that there was a significant difference between pre and post interventional practice scores as evident by ( $p$ -value  $< 0.001$ ).

Knowledge Categories	Pre-Intervention	Post Intervention	p-value
	Frequency (%)	Frequency (%)	
Poor	30 (65.2)	0 (0)	0.000
Fair	16 (34.8)	21 (45.7)	
Good	0 (0)	25 (54.3)	

**Table 3:** Comparison of pre and post Knowledge Categories

## DISCUSSION

The operating room is a high-pressure, elevated risk environment that is prone to multiple mistakes. Modern surgery requires the collaboration of a group of highly qualified professionals. Staff in the operating room should be able to cope with the requirements of the job while also providing safe surgical patient care [16]. In current study 46 nurses were enrolled. 3-month intervention was given to nurses. The majority of nurses were married and female. Before intervention the nurses have poor knowledge regarding aseptic techniques but after intervention their knowledge significantly increased. In the post-intervention phase there were 0(0), 21(45.7%) and 25(54.3%) participants had poor, fair and good knowledge respectively regarding aseptic techniques in operating room. The findings revealed that there was a significant difference between pre and post interventional practice

scores as evident by (p-value <0.001). These findings were comparable with correlational study was conducted to assess the knowledge and practice of operation room nurses. A self-administered questionnaire was used to determine the knowledge and practice of nurses. The results revealed that nurses have excellent knowledge about sterile technique and applied it to some extent. The findings suggest that there was positive association between knowledge and practice among sterile technique among nurses [17]. The current study reported that the nurses have poor knowledge score before the intervention regarding aseptic techniques in operating room. These findings were compared with cross-sectional study by Saggu *et al.*, was conducted to assess the knowledge and practices according to CDC guidelines in Lahore. The study includes all the nurses who provide care to patients. Results revealed that 100% nurses reported that hand hygiene is necessary for infection control. It was reported that nurses have insufficient knowledge (<75%) and practices according to CDC guidelines [18]. Similarly, another study by Dhakal *et al.*, was carried out to explore the knowledge and practice of nurses regarding sterilization in the operation room. Overall, 56 participants were included in the study. According to the data, 62.5 percent of respondents had a high level of knowledge about sterilization, 37.5 percent had an average level of knowledge, and none of the respondents had a low level of knowledge about sterilization [19]. In order to assess nurses' knowledge of sterilization processes, a questionnaire consists of 14 questions regarding sterilization technique was administered. 80% of nurses demonstrated strong knowledge. These findings demonstrate that operating room nurses are adequately knowledgeable about sterilizing procedures [20].

## CONCLUSIONS

Educational interventions on operation room nurses were considerably enhanced operating room nurses' knowledge and practices regarding sterile techniques. Moreover, the effectiveness of educational interventions on operating room nurses' knowledge and practices regarding sterile techniques assisted to enhance effective nurses' roles. The nurses who have good knowledge about sterile technique improved the safety of their patients and operating room staff by lowering difficulties caused by poor sterile technique, and this helped to eliminate public misconceptions about operation procedures.

## Conflicts of Interest

The authors declare no conflict of interest

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