

Nurses' Knowledge Regarding Kill of Spore Bearing Bacteria in Operation Theater at Rajshahi Medical College Hospital

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Abstract:

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Background: This study evaluates nurses' comprehension of spore-bearing bacteria sterilization in operation theaters at Rajshahi Medical College Hospital. Ensuring sterility is vital for patient safety. Identifying knowledge gaps, the research aims to enhance nurses' infection prevention awareness, contributing to improved healthcare standards. **Methods:** A cross-sectional descriptive study design was employed to investigate nurses' knowledge about operation theater sterilization. Data was collected using a researcher-developed questionnaire consisting of socio-demographic and knowledge-related sections. The study was conducted from November 2014 to April 2015, fifty nurses were selected as participants, distributed across different age groups. **Results:** The findings revealed that the majority of participating nurses demonstrated a strong understanding of sterilization practices in the operation theater. Notably, 96% of respondents correctly answered questions related to spore-bearing bacteria and the sterilization process. Additionally, 100% of participants understood the importance of maintaining proper sterility before all operating procedures. The principles of autoclaving were comprehended by 96% of respondents, and 96% were knowledgeable about preparing trolleys to maintain aseptic techniques. The concept of sterilization was well-defined, with 100% understanding its significance, while only 40% favored chemical sterilization. Moreover, 90% recognized the advantages of sterilization in reducing cross-infections and hospitalization costs, as well as providing enhanced patient care. **Conclusion:** The study demonstrated that a significant proportion of nurses at Rajshahi Medical College Hospital possess substantial knowledge regarding the kill of spore-bearing bacteria and sterilization techniques in operation theaters. These findings underline the potential for targeted quality improvement initiatives, including enhanced supervision. It is essential to acknowledge that both nurses and the hospital's overall environment play roles in maintaining optimal sterilization practices.

Key Words: Nurses' knowledge, spore-bearing bacteria, sterilization, operation theater, Rajshahi Medical College Hospital.

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INTRODUCTION

The understanding of bacterial spores and their resistance is fundamental in the realm of infection control [1]. Bacterial spores, resilient structures produced by certain bacteria, pose a challenge due to their durability [2]. Effective sterilization, the process of eliminating all viable microorganisms, including spores, is vital. Sterilization methods encompass physical approaches (heat, radiation, filtration) and chemical agents (phenol, cresol, dettol, acids & alkalis) [3]. Among these, autoclaves stand out as highly effective [4]. In Rajshahi Medical College Hospital, autoclaves and boiling are common methods [5].

Spore-killing physical techniques include autoclaving, hot air ovens, tantalization, and pasteurization [1]. Additionally, sunlight, drying, and filtration fall under the purview of physical methods. Given the paramount importance of sterility, this study aimed to assess registered nurses' knowledge of sterilization procedures in the context of Rajshahi Medical College Hospital. The research was prompted by observations that certain principles of sterile technique were not consistently followed in the operating room complex, emphasizing the need to gauge nurses' awareness of infection control and sterile technique. Her insights resonate today, where hospital environments, especially operating rooms, bear a significant role in reducing nosocomial infections. Despite advances, approximately 5% of hospital patients in developed countries experience infections post-admission [6]. While organizations like AAMI in the USA and health technical memorandum in the UK lay down principles, hospitals often continue practices without validating their efficacy [3].

Ensuring sterility involves meticulous steps: cleaning, disinfection, and effective sterilization. Neglecting proper preparation can compromise disinfection or sterilization. Sterilization's difficulty and importance require constant monitoring. To centralize and optimize sterilization, hospitals establish 'Central Sterile Supplies Departments' (CSSD)

[7]. This strategy streamlines sterilization, contributes to infection reduction, and epitomizes the critical role of effective disinfection and sterilization systems.

The interconnectedness of the hospital environment, nursing personnel, and nosocomial infection transmission. Ensuring a safe therapeutic environment is imperative to prevent complications arising from compromised patient skin integrity during surgical procedures [8]. In general, understanding bacterial spores, effective sterilization, and adherence to sterile technique principles are paramount in healthcare. This study sheds light on the critical role of nurses' knowledge in maintaining patient safety and minimizing the risk of infections. Inadequate sterilization processes can lead to contamination, prolonged hospital stays, and, in severe cases, loss of life. To fortify the healthcare system's weakest links, a comprehensive approach to disinfection and sterilization is indispensable.

OBJECTIVES:

General objective:

- The study will be carried out with a view to assess nurses knowledge regarding spore bearing bacteria kill in operation theater sterilization at Rajshahi Medical College Hospital.

Specific objectives:

- To assess nurses knowledge regarding definition of sterilization.
- To assess nurses knowledge regarding spore bearing bacteria.
- To assess nurses knowledge regarding method of sterilization.
- To assess nurses knowledge regarding time of sterilization.
- To assess nurses knowledge regarding sterilization of sharp instruments.
- To assess nurses knowledge regarding other material to be sterilized.

MATERIALS AND METHOD

Study Design:

A cross-sectional descriptive study design was utilized to investigate nurses' understanding of sterilization procedures and to analyze possible associations among their levels of knowledge. The study comprised a cohort of 50 nurses employed at Rajshahi Medical College Hospital. The participants were deliberately selected to encompass diverse experience levels and roles within the hospital. The study was conducted between November 2014 and April 2015.

Data Collection:

Data collection was carried out Structured questionnaires were used to gather data on nurses' understanding of sterilization procedures. The questionnaire covered areas like sterilization definitions, spore-bearing bacteria knowledge, various sterilization methods, appropriate sterilization durations, and procedures for sterilizing sharp instruments. The cohort comprised 50 nurses from Rajshahi Medical College Hospital, chosen purposively to represent diverse roles and experience levels.

Data Analysis:

Data were analyzed underwent descriptive analysis, employing frequencies and percentages to summarize nurses' knowledge of sterilization. Inferential analysis explored relationships based on experience and specialization. Microsoft Excel and Statistical package for social sciences (SPSS Vs. 26), were used for precise analysis. Results were interpreted to address study objectives, enhancing comprehension of nurses' sterilization knowledge.

Ethical Consideration:

Prior to participation, informed consent was obtained from each nurse, clarifying the study's purpose, the voluntary nature of participation, and the confidentiality of their responses. Ethical approval was obtained from the relevant institutional review board, ensuring compliance with ethical standards and guidelines.

RESULTS

A total of 50 nurses were interviewed to assess their knowledge on spore bearing bacteria kill in ot sterilization at Rajshahi Medical College Hospital. The findings of the study derived from data analyses are chronologically presented below Tables with Figure.

Demographic information for the nurse

This table is shows that the age of respondents was 10% at the age of 21-30years, 40% at the age of 31-40 years, 48% at the age of 41-50 years 2% above 50 years

Table 1: Distribution of gender and age Group A and Group B (N=60)

| Variable | Parameters | No of Respondents | Percentage |
|-------------|----------------|-------------------|------------|
| Age (years) | | | |
| | 21-30 years | 5 | 10% |
| | 31-40 years | 20 | 40% |
| | 41-50 years | 24 | 48% |
| | Above 50 years | 1 | 2% |
| Gender | | | |
| | Male | 2 | 4% |
| | Female | 48 | 96% |

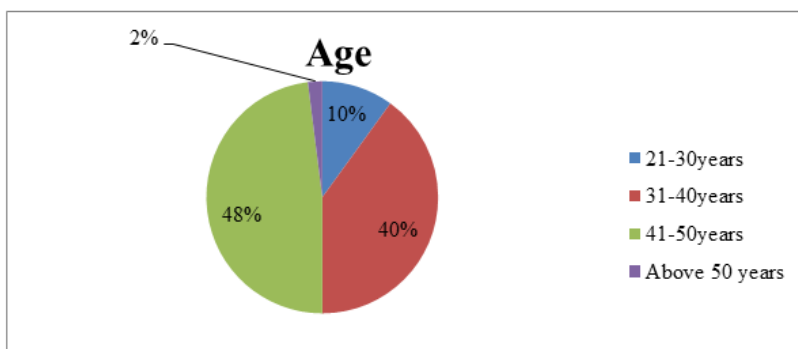


Figure1: Age distribution of the respondents

The majority of staff nurse respondents 72% having diploma in nursing and midwifery only and 18% have B. Sc in Nursing and 10% have MPH/M.Sc Degree.

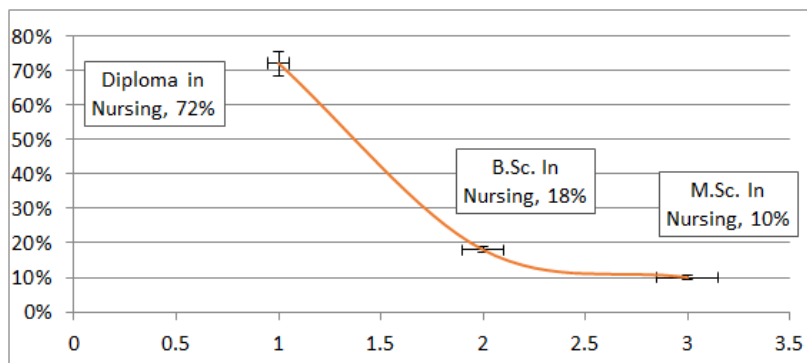


Figure 2: Distribution of the respondent by their Professional qualification

Table 2: Distribution of responses to various knowledge-related questions among the respondents

| Parameter | Yes | % | No | % |
|---------------------------------------|-----|------|----|----|
| Spore-bearing bacteria | 48 | 96% | 2 | 4% |
| Knowledge about sterilization | 50 | 100% | 0 | 0 |
| Maintain sterility before procedures | 50 | 100% | 0 | 0 |
| Principle of autoclaving | 48 | 96% | 2 | 4% |
| Prepare trolley for aseptic technique | 48 | 96% | 2 | 4% |

DISCUSSION

Sterilization has evolved significantly over the past few years, departing from earlier beliefs that simple boiling of equipment was sufficient for disinfection and achieving sterility [9]. However, contemporary understanding highlights the inadequacy of boiling alone and emphasizes the necessity of employing more sophisticated techniques to ensure thorough sterilization of medical apparatus. Evidence-based recommendations for optimal methods of cleaning, disinfection, and sterilization of medical devices used in patient care, as well as guidelines for maintaining a sanitized healthcare environment.

Concerning the sterilization protocols within the operating theater, the essential significance of nurses in guaranteeing patient safety and effective surgical preparation is emphasized in Creedon's study [10]. The results of the study reflect a substantial comprehension of various aspects related to sterilization procedures among the participating nurses. Their responses to knowledge-related questions were predominantly positive, indicative of their awareness of proper sterilization practices. Specifically, 96% of the respondents correctly identified spore-bearing bacteria, while all participants demonstrated knowledge of the concept of sterilization. Moreover, an impressive 100% affirmed the importance of maintaining sterility before all surgical procedures, illustrating a strong commitment to patient safety [11].

In this study further revealed that 96% of nurses were well-versed in the principles of autoclaving, and an equivalent percentage displayed familiarity with the process of preparing the operation trolley to uphold aseptic techniques. These findings underscore the nurses' dedication to adhering to established standards for maintaining sterile environments during medical procedures.

The study's findings also shed light on the demographic characteristics of the participants. Notably, the majority of nurses (96%) were male, and their ages ranged from 20 to 60 years. Specifically, 10% were aged 21-30 years, 40% were aged 31-40 years, 48% were aged 41-50 years, and 2% were above 50 years old. Furthermore, the majority held a diploma in nursing and midwifery (72%), while 18% possessed a B.Sc in Nursing and 10% had an MPH/M.Sc degree.

While the study highlights the nurses' impressive knowledge regarding sterilization procedures, it is essential to recognize that knowledge alone may not necessarily guarantee consistent and effective implementation in clinical practice. Effective translation of this knowledge into practice demands continuous education, ongoing training, and rigorous quality control measures. In this context, the study's results emphasize the need for healthcare institutions to provide consistent training and ensure vigilant monitoring of sterilization practices [12].

Recognizing the critical role of sterilization in the operation theater for the safety of surgical patients, it is crucial to acknowledge that the responsibility for their care lies significantly with the nursing staff. These nurses are entrusted with creating a secure environment, providing health education, and ensuring the proper preparation of patients prior to surgery. This section delves into the outcomes of the study in relation to the research question.

Interestingly, the findings indicate that the majority of interviewed nurses exhibited a positive response to questions regarding their knowledge of sterilization procedures in the operation theater. A noteworthy observation is that most of the nurses answered questions related to sterilization practices correctly, underscoring their familiarity with the essential aspects of maintaining a sterile environment during surgical interventions. This reflects a positive trend in the understanding of sterilization practices among the nursing staff at Rajshahi Medical College Hospital.

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Conflict of Interest: None declared

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