

Nurses' Knowledge Regarding Control and Prevention of Nosocomial Infection at Rajshahi Medical College Hospital

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Abstract:

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Background: Infection control is a critical aspect of healthcare, ensuring patient safety and reducing the spread of nosocomial infections. Adequate knowledge among healthcare professionals, particularly nurses, is essential for effective infection prevention and control. **Objective:** This cross-sectional study aimed to assess of the knowledge among 50 nurses at Rajshahi Medical College Hospital regarding infection control and prevention. **Methods:** A purposive sample of 50 nurses at Rajshahi Medical College Hospital, Rajshahi, was selected. Data collection involved a two-part questionnaire: one for demographics and the other for assessing infection control knowledge. Content validity was established through consultations with a guide teacher. The assessment occurred between November 2014 and April 2015. **Results:** The demographic data revealed that the majority of participants were between 41 and 50 years old (56%), female (92%), and had completed their education Diploma in Nursing 37 (74%), B.Sc in Nursing 10 (20%), MPH/M.Sc 3 (6%). The knowledge assessment revealed that: 96% of respondents correctly identified infection as microbial multiplication within host tissues. 76% recognized nosocomial infection as infections acquired in the hospital. 90% identified excessive visitors on the ward as a factor leading to infection. 90% believed that improper sterilization of instruments in the ward causes infection. 76% mentioned tenderness as a sign of infection. 70% acknowledged the importance of maintaining patients' personal hygiene in preventing infection. 76% suggested stopping feeding as a measure for controlling infection. **Conclusion:** This study highlights a need for improved knowledge among nurses regarding infection control and prevention. While successful infection control programs have proven effective, there is also a requirement to focus on educating nurses about infection prevention and nutritional interventions. Strengthening overall education and nursing training programs can enhance nurses' understanding of infection control, ultimately improving patient care.

Key Words: Infection control, Nosocomial infection, Nurses' knowledge, Prevention.

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INTRODUCTION

Nosocomial infections, also known as hospital-acquired infections, are infections acquired by patients during their hospital stay for reasons unrelated to the infection. They encompass infections that develop within the healthcare facility after admission or even after discharge, including occupational infections among healthcare staff. These infections are a significant concern, contributing to increased morbidity and mortality, and their public health impact is growing due to factors such as population growth, overcrowding, compromised immunity, emerging pathogens, and antibiotic resistance [1]. Infection control is a fundamental quality standard in patient care, crucial for the well-being and safety of both patients and healthcare personnel. Reducing infection rates requires the implementation of structured infection control programs [2]. Infections are caused by invading microorganisms, and the risk is heightened in individuals with compromised immune systems, such as neonates, the elderly, and those with severe underlying illnesses or undergoing medical procedures [3].

Disinfection, the process of eliminating microorganisms from inanimate objects, is a critical aspect of infection control, involving the use of chemical disinfectants like alcohols, chlorine, and phenols [4]. The primary goal of any infection control program, whether in healthcare facilities or communities, is to prevent avoidable infections. This necessitates adherence to rigorous clinical standards and sound infection control principles [5]. In Egypt, sepsis-associated maternal deaths reached a concerning sixty cases in 1992-1993. Universal precautions, advocating safe working practices to protect both healthcare workers and patients from blood and bodily fluid-related infections, are crucial, especially for diseases like HBV transmitted through infected blood [6].

Healthcare professionals must take standard precautions at all times, considering all blood and bodily fluids as potential infection sources due to the risk of carrying various blood borne diseases. Risk assessments of procedures are essential for safe working practices [7]. Effective training is vital to ensure the understanding and implementation of

infection control concepts across healthcare settings. Infection control nurses play a pivotal role in this regard, contributing to the development of clinical practice standards. Their responsibilities encompass early detection, surveillance, and educating healthcare staff, patients, families, and visitors on prevention and control measures [8,9]. Nurses are at the forefront of infection control, adapting interventions based on factors like host susceptibility, pathogen virulence, antibiotic susceptibility, and clinical manifestations.

In study, nosocomial infections pose significant challenges to healthcare, emphasizing the critical role of infection control measures, healthcare worker education, and the pivotal contribution of infection control nurses in safeguarding patient and staff well-being.

Objective

General objective:

- To assess the nurse's knowledge on control of nosocomial infection in relation to the prevention.

Specific objectives:

- To assess the socio demographic characteristics of the respondent.
- To assess knowledge about nosocomial infection.
- To find out the causes of nosocomial infection.
- To find out sign and symptoms of infection.
- To assess knowledge about infection prevention.
- To assess knowledge about management of infection.

MATERIALS AND METHODS

Study Design:

A descriptive correlation design was employed to investigate the knowledge of 50 Nurses regarding the control and prevention of nosocomial infections in hospitalized patients at Rajshahi Medical College Hospital. Data collection occurred between November 2014 and April 2015. The study included all senior staff nurses working in Surgery, Medicine, Post-operative wards, and the Operation Theater at RMCH.

Inclusion Criteria:

- Full-time staff nurses in Surgery, Medicine, Post-operative wards, or the Operation Theater.
- Responsible for direct patient care.
- Possessed a minimum educational qualification of a three-year nursing diploma.
- Had at least six months of working experience in their respective units.

Exclusion Criteria:

- We're not working full-time in Surgery, Medicine, Post-operative wards, or the Operation Theater.
- Did not have roles and responsibilities involving direct patient care.
- Held educational qualifications below a three-year nursing diploma.
- Had less than six months of working experience in their respective units.
- Declined to participate or did not provide informed consent for the study.

Data collection instrument:

The instrument developed by the researcher was divided into 2 sections including

- 1) Demographic Questionnaire
- 2) Questionnaire on Nurses knowledge regarding control and prevention of nosocomial infection in hospitalized patient's in Rajshahi Medical College. This of each section will be explained as follows:

Data analysis:

Data analysis for this study was performed using IBM Statistical Package for the Social Sciences (SPSS) Statistics vs. 26.0. Initially, demographic characteristics and nurses' knowledge regarding nosocomial infection control were manually examined. Frequencies and percentages were computed to assess data distribution. Information from completed questionnaires was carefully entered into a database to ensure accuracy. Descriptive statistics, including measures like mean and standard deviation, were applied to summarize and convey the findings effectively. The results were presented through tables and graphical representations, enhancing the comprehensibility of the research outcomes.

Ethical consideration:

The Ethical Review Committee (ERC) at Rajshahi Medical College Hospital gave their blessing to the following study's methodology before it was put into action. Participation in this study is entirely optional, and all participants' personal information will be kept strictly confidential. No unnecessary risks will be imposed on the participants, and the researchers will do everything they can to ensure their safety. These factors are essential for doing the research ethically, respecting the rights of participants, and upholding ethical standards.

RESULTS

The results regarding nurses knowledge on control and prevention of nosocomial infection at Rajshahi Medical College Hospital is described in this chapter.

Table 1: Age distribution of the respondents

Variable	Parameters	N=50	Percentage
Age	21-30 years	2	4%
	31-40 years	12	24%
	41 -50 years	28	56%
	51-60 years	8	16%
Gender	Male	4	8%
	Female	46	92%

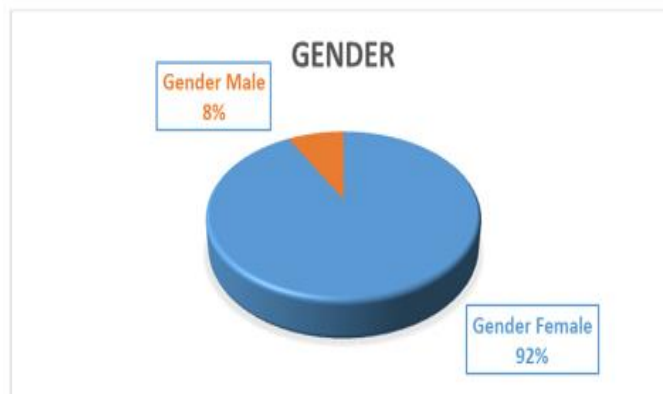


Figure 1: Graph showing the percentage of gender for nurses

The majority of the respondents 56% were in age group of 41-50 years smallest number of the respondents 4% were below 30, 24% respondents were in age group of 31-40 years, and 16% respondents were in age group of 51-60 years.

Table 2: Distribution of Professional qualification of the respondents

Variable	Degree	N=50	Percentage
Professional qualification	Diploma in Nursing	37	74%
	B.Sc in Nursing	10	20%
	MPH/M.Sc	3	6%

Table 2: shows that the majority of staff nurse respondents 100%, having diploma in nursing and midwifery only and 10% have B. Sc in Nursing and 10% have MPH/M.Sc Degree.

Table 3: Distribution of Length of service of the respondents

Variable	Parameters	N=50	Percentage
Length of service	1-10 years	2	4%
	11-20 years	12	24%
	21-30 years	28	56%
	31-40 years	8	16%

That majority of staff nurse 56 % respondents had age of their length service between the years 21–30 and 4% nurses are serving from 1-10 years, 24% were within the 11–20years and 16% nurses are serving from 31-40 years.

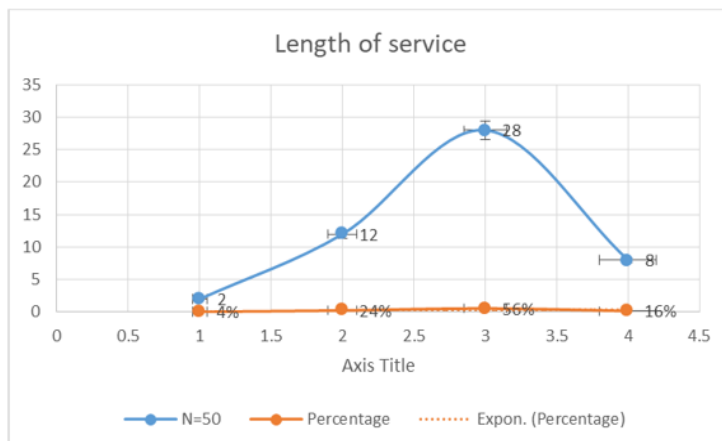


Figure 2: Service time of the respondents

Table 4: Distribution of respondent by their knowledge about what is infection?

Variable	Parameters	N=50	Percentage
What is infection?	Microbial multiplication within host tissues	48	96
	Absence of clinical signs and symptoms	2	4
	Do not know	0	0
What is nosocomial infection?	The infection acquired from the hospital	38	76
	The cross infection	12	24
	The previous home infection	0	0
What are the following factors do you think that lead to develop infection?	Excessive visitors on the ward	45	90
	Cardiac problem	4	8
	Do not know	1	2
What are the causes of infection in the ward?	The lack of proper sterilization of instruments in the ward	45	90
	Negligence of health workers	4	8
	Do not know	1	2
Which factor do you think are helpful in preventing infection?	Improper nutrition	0	0
	Maintenance of patients personal hygiene	35	70
	Cleanliness of the ward	12	24
	Toilet and bathroom facility without proper water supply	0	0
	Necessary medicine supply	3	6
What are the following-barriers do you think act as a preventing infection?	Shortage of staffs	18	36
	Lack of proper sterilization	30	60
	proper quality of care	0	0
	adequate supplies of equipment	0	0
	Work load	2	4

In a survey on infection knowledge, 96% recognized microbial multiplication within host tissues as a sign, 4% mentioned the absence of clinical symptoms, and 0% were unsure. Regarding nosocomial infections, 76% linked them to hospitals, 24% to cross-infection, and 0% to previous home infections. Regarding infection causes, 90% pointed to excessive ward visitors, 8% mentioned cardiac problems, and 2% were uncertain. For the causes of infection, 90% cited improper instrument sterilization, 8% blamed healthcare worker negligence, and 2% had no answer. 70% answered Maintenance of patient’s personal hygiene, 24% answered Cleanliness of the ward, 0% answered Toilet and bathroom facility without proper water supply and 6% answered necessary medicine supply.

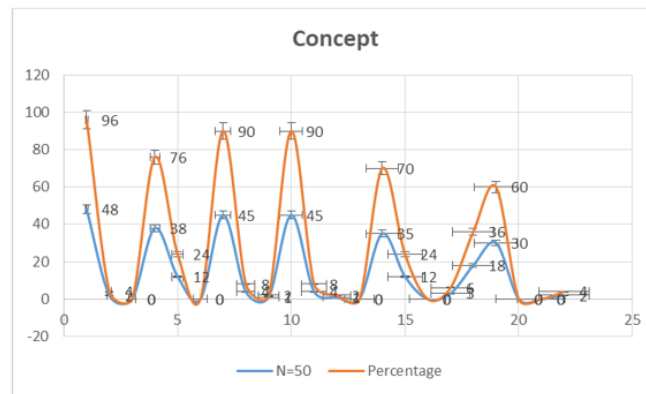


Figure 3: Knowledge of concept about Infection

Table 5: Distribution of respondent by their knowledge about what is sing with complication of infection?

Variable	Parameters	N=50	Percentage
What are the signs of infection?	Tenderness	38	76%
	Temperature 99 ⁰ F	10	20%
	Others	2	4%
What are the complications of infection?	Muscle damage	36	72
	Abdominal retention	13	26
	Do not know	1	2

Infection knowledge: 76% identified tenderness as a sign, 20% cited a 99°F temperature, 76% recognized muscle damage as a complication, 26% mentioned abdominal retention, while 2% were uncertain.

DISCUSSION

The study aimed to assess nurses' knowledge regarding the control and prevention of nosocomial infections at Rajshahi Medical College Hospital. The discussion below provides insights into the findings and their implications. The study revealed that, on average, nurses possessed a good level of knowledge concerning the prevention of nosocomial infections [2]. However, it is essential to note variations in knowledge levels, with pre-operative knowledge being relatively low and post-operative knowledge reaching a moderate level. Several factors may contribute to the disparities in nurses' knowledge. Notably, the majority of participants held diploma-level nursing qualifications (74%), with fewer possessing bachelor's degrees (20%) and even fewer having pursued further education (6%). In Bangladesh, nursing curricula at both the diploma and bachelor's levels incorporate general principles of infection control but may lack a strong focus on specific infection prevention aspects. Therefore, advancements in medical science and healthcare practices may have contributed to nurses' improved knowledge levels.

The assessment of nurses' knowledge highlighted areas of strength and areas requiring improvement. Regarding infection-related terminology, a high percentage of respondents correctly identified terms such as "infection" and "nosocomial infection" [10]. However, some knowledge gaps existed, particularly in understanding the meaning of infection control and recognizing factors that lead to infections. Nurses demonstrated a strong understanding of certain infection control practices, such as the importance of maintaining patients' personal hygiene and performing aseptic precautions during dressing changes [4]. However, gaps existed in knowledge related to specific practices, such as the optimal timing and method of pre-operative hair removal and shaving. Furthermore, the study indicated that nurses had a good understanding of recognizing signs of infection, the significance of handwashing in infection prevention, the importance of swab cultures for investigating infections, and the need to maintain the nutritional status of surgical patients [11].

The findings underscore the importance of reviewing and revising nursing education and training programs in infection prevention [12]. While nurses demonstrated competence in general infection control practices, gaps existed in specific areas, suggesting a need for targeted education and training in evidence-based infection prevention practices [13]. Addressing these knowledge gaps is vital for enhancing nursing practice and improving patient outcomes. Additionally, there may be confusion among nurses regarding their roles in infection prevention, as preventive activities are often perceived as the responsibility of surgeons. Clearer delineation of roles and responsibilities within healthcare teams is essential to ensure effective infection control measures are integrated into daily practice [8].

In this study assessed nurses' knowledge of nosocomial infection control at Rajshahi Medical College Hospital, with findings emphasizing the percentage-based outcomes and influencing factors. Educational background played a role, with 74% holding diploma-level nursing qualifications, 20% bachelor's degrees, and 6% advanced degrees. While nurses demonstrated a solid understanding of infection basics, with 96% correctly defining it, gaps were evident, particularly in pre-operative knowledge. Despite 76% accurately identifying nosocomial infections, specific areas, like the best pre-operative hair removal practices, revealed knowledge deficits. These findings underscore the need to revise nursing education and training programs, emphasizing evidence-based infection prevention practices, for comprehensive patient care and safety. In this study provides valuable insights into nurses' knowledge of nosocomial infection prevention at Rajshahi Medical College Hospital. While nurses generally exhibited a good level of knowledge, there were notable gaps in specific areas. To enhance infection prevention practices, ongoing education and training programs should be revised and strengthened, emphasizing evidence-based practices and addressing knowledge deficiencies.

CONCLUSION

The study revealed concerning gaps in nurses' knowledge, particularly regarding common infections, and identified suboptimal adherence to disinfection practices. However, nurses displayed a positive attitude towards guidelines and protocols for disinfection. Post-test results indicated improved knowledge with appropriate education. To enhance patient safety and reduce Healthcare-Associated Infections (HAIs), comprehensive infection control education and training programs are vital. Continuous in-service education, refresher courses, and vigilant surveillance are essential components of an effective strategy to address these challenges in infection control.

Recommendations:

- Prepare infection control nurses with education in adult learning theory, curriculum development, and instructional media, along with a strong foundation in statistics and scientific research.
- Offer periodic refresher training to keep nurses updated on infection control practices.
- Prioritize comprehensive patient care throughout the peri-operative period to minimize surgical site infections.
- Ensure the appropriate use of antibiotic prophylaxis in healthcare settings.

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