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Evaluation of the Knowledge and Attitude towards Nosocomial Infection among Nursing and Paramedical Students in KMC Nursing and Paramedical Institute, Maharajganj, Uttar-Pradesh (India)

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ABSTRACT

Objective: To evaluate the awareness about hospital acquired or nosocomial infection among bachelors of nursing and paramedical students. **Methods and Materials:** This questionnaire based cross sectional study was conducted at KMC Nursing and Paramedical Institute Maharajganj, Uttar Pradesh for the period of 6 Six months. A self-administered validated questionnaire was structured by using Google form & was distributed in different What's App groups via the internet among students coming to pursue an undergraduate degree & at KMC Nursing and Paramedical Institute Maharajganj, Uttar Pradesh, India. **Result:** This study consisted 293 nursing and paramedical students of different branches. Finally, we found that female students were 161 (54.94%) and 132(45.06%) were male students. On the basis of results, Finally, we found that the overall the knowledge level of students about nosocomial infection or hospital acquired infection were effective and adequate. **Conclusion:** Finally, we concluded that the overall the knowledge level of students about nosocomial infection or hospital acquired infection were effective and adequate. The sample size of this current study was small because current study included only one college's students. Hence it should need or suggest further study on large sample for enhance the more accuracy and much better results.

Keywords: Nosocomial Infection, Paramedical Students, Infection Control, Healthcare-Associated Infections, Nursing Students.

INTRODUCTION:

Nosocomial infections pose a significant threat to patient health and safety within healthcare settings. Paramedical students play a crucial role in infection control and prevention strategies[1]. Nosocomial infections, or hospital-acquired infections, refer to infections that patients develop during the course of medical or surgical treatment within a healthcare facility. Nosocomial infections represent a major challenge for healthcare systems globally, significantly affecting patient illness and death. As stated by the World Health Organization, the occurrence of hospital-acquired infections ranges from 5% to 10% among hospitalized patients in developed countries. However, this percentage tends to be higher in developing nations due to resource constraints and inadequate infrastructure[2].

Hospital-acquired infections, also known as nosocomial infections, typically develop within 48 hours of a patient's admission. These infections are absent during the hospital stay but can manifest after discharge[3]. These infections may appear after discharge and can occur in various healthcare environments, such as patient transportation, long-term care facilities, and hospitals. The most prevalent types of hospital-acquired infections include pneumonia, urinary tract infections, bloodstream infections, and infections at surgical sites. These infections can consequence from a variability of issues, containing with inadequate hand hygiene practices, improper sterilization techniques, prolonged hospital stays, the widespread use of invasive devices, and overcrowded healthcare facilities[4]. When a pathogen or pathogens move to a vulnerable patient host, infection results. In contemporary healthcare, these infections are linked to invasive treatments and surgeries, indwelling medical devices, and prosthetic devices. The source or kind of infection and the causative pathogen—which could be bacterial, viral, or fungal—determine the etiology of healthcare-associated infection[5].Nursing and paramedical professionals are key players in the prevention and control of nosocomial infections. As healthcare providers, they are often the first line of defense in safeguarding patient safety and ensuring that infection control practices are strictly followed. Nursing and Paramedical students, who are in the process of transitioning from education to clinical practice,

must be equipped with the necessary knowledge and skills to recognize and prevent nosocomial infections. Their understanding of infection control principles, coupled with a positive attitude towards these measures, is essential for reducing the risk of nosocomial infections in healthcare settings[6]. Healthcare-associated infections are the most common adverse events that compromise patient safety. Patients visit healthcare facilities for treatment and prompt management; however, they may also acquire serious infections from healthcare providers. These illnesses can impact individuals of all ages, including adults, children, and the elderly. Respiratory tract infections are more prevalent among children, while urinary tract infections are more frequent in adults. According to the Hospital Infection Society of India, an effective infection control program can prevent 25% to 50% of healthcare-associated infections (HAIs)[7].The education and training of nursing and paramedical students are therefore crucial in shaping their future professional practices. It is essential to incorporate thorough education on infection prevention and control policies, hand hygiene practices, appropriate use of personal protective equipment, and sterilization methods into the curriculum[8]. Additionally, these students must develop a strong sense of responsibility toward patient safety and a proactive attitude toward minimizing the risk of hospital-acquired infections. Every year, new students or interns begin their practical training in various hospital specialties as part of their college programs. Research has shown that awareness and knowledge of infection control protocols among different groups of medical personnel can differ significantly. Additionally, adherence to these protocols is heavily influenced by the behaviour and practices of senior staff members[6,8]. Infection control is a crucial aspect of practice for all healthcare professionals, as it safeguards their health and helps decrease the incidence of hospital-acquired infections, ultimately enhancing patient safety[9]. Hand hygiene among healthcare workers is recognized as essential for effective infection control.In the context of India, the prevalence of nosocomial infections presents an even more pressing concern due to the challenges faced by the healthcare system. India's healthcare infrastructure, particularly in rural areas, often suffers from resource constraints, understaffed facilities, and overcrowding, which create conditions conducive to the spread of hospital-acquired infections. Uttar Pradesh, the most populous state in India, is no exception to these challenges. Healthcare facilities in both urban and rural areas face high patient loads, which can strain infection control protocols and increase the risk of nosocomial infections [10].The KMC Nursing and Paramedical Institute, located in Maharajganj, Uttar Pradesh, plays a critical role in preparing nursing and paramedical students for careers in the healthcare sector. These students will soon transition into various healthcare facilities, where they will be responsible for caring for patients and preventing the spread of infections. Therefore, it is vital to evaluate their current knowledge of nosocomial infections and their attitude toward infection control measures. This assessment can provide valuable insights into the effectiveness of their education and training and help identify areas where further improvements are needed[11].This study aims to identify gaps in knowledge by evaluating students' understanding of the causes, transmission, prevention, and control of hospital-acquired infections, thereby highlighting areas where further training may be necessary. The objective of this research is to assess the knowledge and attitudes of nursing and paramedical students at the KMC Nursing and Paramedical Institute concerning hospital-acquired infections[12]. Furthermore, the research will explore the students' attitudes toward infection prevention measures, including hand hygiene, sterilization practices, and the proper use of personal protective equipment. The findings from this study will not only contribute to the improvement of infection control education in the KMC Nursing and Paramedical Institute but also provide a foundation for developing targeted interventions aimed at enhancing the overall preparedness of nursing and paramedical students. These interventions could include the integration of more practical infection control exercises, workshops, and simulations that emphasize the importance of adhering to strict infection control protocols. In the long run, these efforts will play a crucial role in reducing the incidence of nosocomial infections and ensuring a safer healthcare environment for both patients and healthcare workers[13].Consequently, adhering strictly to infection control guidelines is crucial. This study was designed to investigate the knowledge and attitudes of nursing and paramedical students concerning hospital-acquired infections (HAIs).

Materials and Methods:

This study involved nursing and paramedical students to evaluate their knowledge and attitudes concerning hospital infection control. The research included 293 nursing and paramedical students of KMC Nursing and Paramedical Institute Maharajganj, Uttar Pradesh, (India). The study was conducted using ethically approved self-administered questionnaires.

Study Type:

A questionnaire-based cross-sectional study was conducted at the KMC Nursing and Paramedical Institute in Maharajganj, Uttar Pradesh, India. This study utilized a questionnaire to assess the knowledge of Bachelor of Nursing and Bachelor of Paramedical students from various branches regarding hospital-acquired or nosocomial infections.

Study Design:

This research employed a cross-sectional, questionnaire-based design and was conducted among Bachelor of Nursing and Paramedical students at the KMC Nursing and Paramedical Institute in Maharajganj, Uttar Pradesh, India. Ethical approval was obtained from the college review committee.

Study Area:

A questionnaire-based cross-sectional study was conducted at the KMC Nursing and Paramedical Institute in Maharajganj, Uttar Pradesh, India. The participants were students enrolled in undergraduate programs at the institute.

Study Duration:

This cross-sectional, questionnaire-based study was conducted over a period of six months, from March 2024 to August 2024, at the KMC Nursing and Paramedical Institute in Maharajganj, Uttar Pradesh, India.

Inclusion Criteria:

1. All first and second-year undergraduate students from paramedical branches, including:

a. Bachelor of Medical Laboratory Science

b. Bachelor of Physiotherapy

c. Bachelor of Medical Radiology and Imaging Technology

d. Bachelor of Operation Theatre Technology

e. Bachelor of Optometry

2. All Bachelor of Science (B.Sc.) Nursing students of first and second years.

Exclusion Criteria:

1. Faculty members of the KMC Nursing and Paramedical Institute.

2. KMC digital All Hospital Staff.

3. KMC Nursing and Paramedical Institute All diplomas' students.

Study Population:

The size of the population was 300 students but finally we got 293 participant's responses. The population comprised all students, both male and female, who were physically and mentally fit and aged between 18 and 31 years. This included undergraduate nursing and paramedical students from various branches, such as radiological imaging techniques, medical laboratory techniques, optometry, operation theatre technology, and physiotherapy, while excluding those who met the exclusion criteria.

Method of Data Collection:

The study was conducted among undergraduate nursing and paramedical students from various branches, including radiological imaging techniques, medical laboratory techniques, optometry, operation theatre technology, and physiotherapy. Participants who met the inclusion criteria and were willing to take part were included in the study. The purpose of the study was explained to each participant individually.

After assessing these criteria, a total number of 293 participants were included in the study. verbal consent was obtained from all students participating in the study. The self-administered validated questionnaire was structured by using Google form & was distributed in different What's App groups via the internet among students coming to pursue an undergraduate degree & at KMC Nursing and Paramedical Institute Maharajganj, Uttar Pradesh, India. The questionnaire was developed after reviewing various related literature and consisted of 18 items divided into two sections. The first section of the questionnaire comprised demographic data including name, age, gender, program, department, and year. The second section of questionnaire related to knowledge, awareness, and preventions regarding hospital acquired or nosocomial infections.

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Statistical Analysis:

A quantitative approach was utilized, employing a structured questionnaire to gather data from a sample of first- and second-year undergraduate nursing and paramedical students across various branches. The findings reveal insights into the current level of knowledge and attitudes towards nosocomial infection control among these students, providing valuable information for educational interventions and policy enhancements to mitigate the risk of nosocomial infections.

The collected data was compiled, tabulated, and analyzed using Google Forms.

Results:

In this cross-sectional, questionnaire-based study, the sample size was initially set at 300; however, 293 valid responses were ultimately received. Incorrect and duplicate responses were excluded due to statistical and technical considerations. This current study included students of first year and second year undergraduate paramedical students of different paramedical branches such as MLS, BPT, BMRIT, OTT, BOPTOM, and also the B.Sc. Nursing students.

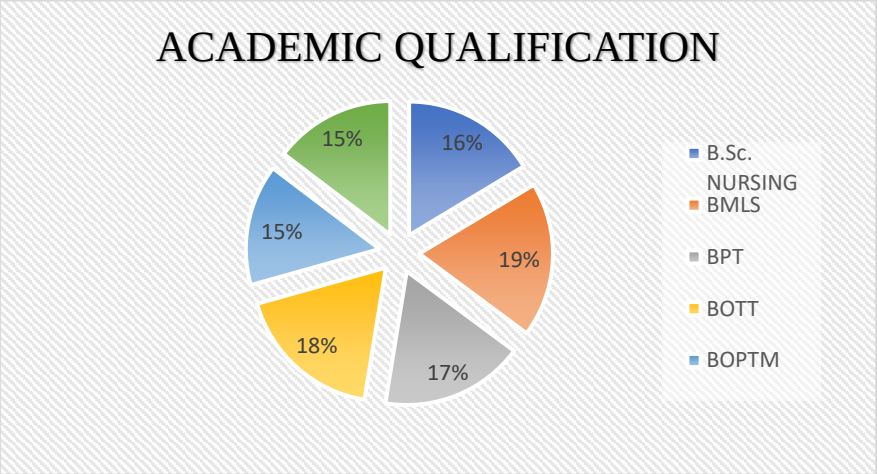

Figure No. 1: Distribution of participant data utilized in this study.

The questionnaire was filled by 293 students of undergraduate students of nursing and different branches paramedical department out of which 161 (55.09%) were female and 132(45.8%) were male students. **(See figure No. 2.)**

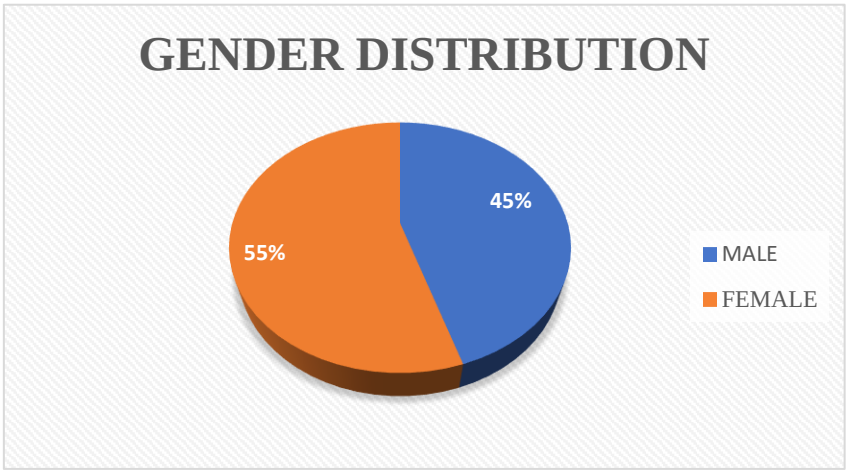

Figure No.2: Showing the total number of male and female participants.

At the conclusion of this study, the analysis showed that for the first question, 270 of the 293 students (92.15%) answered correctly, while 23 students (7.85%) did not provide the correct response. This question about the common sources of hospital acquired or

nosocomial infection. The second question about timing of nosocomial infection after visit and admitted of the hospital out of 293 students 256(87.3%) Students answered correctly, while the remaining 37 (13.7%) did not provide the correct response. For question number three, 195 students (66.50%) provided the correct answer, while the remaining 98 students (33.50%) did not give the correct response. This question addressed an uncommon hospital-acquired infection.

The fourth question was about occurrence of nosocomial infection 184(62.79%) were written correct answer and 109(37.3%) For the fifth question, 223 students (77.0%) provided the correct answer, while the remaining 70 students (23%) did not answer correctly. This question concerned another name for nosocomial infections. The sixth question focused on the most common hospital-acquired or nosocomial infection. Out of 293 students, 215 (73.3%) provided the correct answer, while the remaining 78 students (26.7%) did not respond correctly. For question number seven, 237 students (80.8%) answered correctly, while the remaining 56 students (19.2%) did not provide the correct response. This question addressed the first priority in preventing hospital-acquired or nosocomial infections.

The question number eight was about the factors influencing hospital acquired infection or nosocomial infection. 241(82.25%) Students answered correctly, while the remaining 52 students (17.75%) did not provide the correct response.

For the question number nine 232(79.18%) Students answered correctly, while 61 students (20.82%) did not provide the correct response. This question was related to proper steps of effective hand washing.

The question number ten focused on the time duration for effective hand washing. Out of the students, 213 (72.6%) provided the correct answer, while the remaining 80 students (27.4%) did not give the correct response. For question number eleven, 240 students (81.91%) provided the correct answer, while the remaining 53 students (18.1%) did not respond correctly. This question focused on the types of hospital-acquired infections.

The question number twelve was related to importance of perform hand hygiene prior to the leave an isolated area of the healthcare facility. 183(62.45%) students were written the correct answer while rest 110(37.55%) students were not write the correct answer.

For question number thirteen, which asked about "which of the following is not a standard precaution," 102 students (34.81%) provided the correct answer, while 191 students (65.19%) did not answer correctly. Question number fourteen pertained to the indications for hand washing. Out of the students, 202 (68.94%) provided the correct answer, while the remaining 91 students (31.06%) did not respond correctly. The question number fifteen was “A nosocomial infection is an infection acquired in healthcare facility”. 270(92.15%) students were said true while only 23(7.85%) students said that it is false.

For the question number sixteen 246(83.95%) students answered correctly, while 47 students (16.05%) did not provide the correct response. This question is related to good infection prevention and control practice.

The question number seventeen was about types of precautions in hospital acquired infections or nosocomial infections. 211(72.01%) students provided the correct answer, while the remaining 82 students (27.99%) did not respond correctly. For question number eighteen, 166 students (56.60%) answered correctly, while 127 students (43.40%) did not provide the correct response. This question was related to five moments of hand hygiene defined by world health organization (WHO).

Discussion:

Nosocomial infections, commonly referred to as hospital-acquired infections, are a major global health issue. Medical students, in particular, are frequently exposed to infectious diseases, making this a common occupational hazard in their training environments. Addressing the risks associated with these infections is crucial to ensuring the safety and well-being of both healthcare workers and patients.

Many previous research studies related to nosocomial infection or hospital acquired infection shows that the knowledge about infection control prevention is essential for all medical, nursing, paramedical, and allied healthcare professionals.

Some previous studies include medical practitioners, healthcare workers, medical students but in this current study aimed to assess students' knowledge regarding hospital acquired or nosocomial infection. we included bachelor degree or undergraduate students of nursing and different branches of paramedical department.

In a previous study, a self-administered questionnaire was utilized and distributed among healthcare workers at a tertiary care hospital in Wah Cantt. They were included total 50 participants including doctors, nurses and nursing assistant, radiologist, pharmacist and others. They were conducted this to investigate the knowledge gaps among healthcare workers regarding hospital-

acquired infections and how these infections could be prevented within hospital settings. Finally, they were noticed that the all-healthcare workers had sufficient and adequate knowledge about hospital acquired or nosocomial infections. **(Atika Akram[1*] et al. 26th February,2020)[12].**

The current study included only 293 undergraduate nursing students and students from various branches of paramedical sciences. Another cross-sectional prospective study included total of 320 medical (MBBS) students had been invited to complete the pre coded, pre designed close ended self-structured questionnaire. Of the participants, 250 medical students completed the survey. Most respondents were in the age group of 21 to 25 years (66.8%), followed by those aged 15 to 20 years (28%). In total, 205 students (82%) had knowledge of hospital-acquired infections, while the remaining students were either uncertain or unaware. Finally, they suggested the need of some implications. **(Priyanka Agarwal et al. (18th December,2020)[13].**

This current study focused exclusively on undergraduate nursing students and those from various branches of paramedical sciences.

Conclusion:

In this present cross-sectional questionnaire study of 293 students of bachelor of nursing and also different branches of paramedical students taking a part of this study. Finally, we found that the overall the knowledge level of students about nosocomial infection or hospital acquired infection were effective and adequate.

The sample size of this current study was limited, as it included only students from one college. Therefore, further research with a larger sample is needed to improve accuracy and achieve more reliable results. The nursing and paramedical students demonstrated a strong understanding of nosocomial infection control, which was evident in their attitudes, behaviors, and practices related to hygiene for the prevention of these infections.

Nonetheless, this investigation indicates a need for further development in hand hygiene training programs. Educational courses should be conducted more frequently, accompanied by ongoing performance feedback. Since nursing and paramedical students represent a crucial segment of the healthcare workforce, it is essential to provide them with accurate information and proper training regarding preventive measures against nosocomial infections from the early stages of their education. Furthermore, there is a need for a dedicated infection prevention team to become more involved in the training and updating of existing practices. Hand hygiene stations and sinks are critical components in enhancing hand hygiene compliance.

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Conflict of Interest:

The authors state that they have no conflicts of interest to disclose **(NIL).**

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