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Original Research Article

A study on awareness of hospital acquired infections amongst undergraduate medical students in a tertiary care centre

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ABSTRACT

Background: Nosocomial infections are prevalent to a great extent in our health care system. Moreover the prevalence of infective diseases is increasing in medical college students due to less immunity developing in them. Hostel stay, dietary habits further adds to the chances of acquiring oral and gastrointestinal infections. Needles-tick injuries lead to the transmission of viral infestations and are a potentially serious threat to students. The undergraduate medical education is the formative phase and appropriates moment for acquiring the necessary knowledge and skills. There is lack of evidence regarding explicit infection control training in the curriculum of most medical undergraduate courses, which needs to be assessed.

Materials and Methods: A cross sectional study will be our college on students of MBBS course through an online pre-coded, pre-designed, close end questionnaire which will mainly focus on the information about awareness of acquiring hospital based infections.

Implications: The study will give an idea of prevailing infections amongst medical students and common routes of entry. This will help in further planning of proper control measures to curb these, so as to reduce the prevalence of hospital acquired infections amongst medical students.

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1. Introduction

Infection control and hospital acquired infections (HAI) prevalence reports from tertiary care centres are not well established because of lack of staff and resources.¹ Knowledge about the real frequency of nosocomial infections is an important prerequisite for improving hygienic conditions in hospitals. Health care associated infections (HAI) are those infections that the patient acquires while receiving health care.²

The prevalence of infective diseases is increasing in medical college students due to less immunity developing in them.³ Their living in hostel or as day scholars away from home is reflected upon their dietary habit, which further adds to the chances of acquiring oral and gastrointestinal infections.⁴

Hospital acquired infections are spread by numerous routes including contact, intravenous routes, air, water, oral routes, and through surgery. The most common types of infections in hospital include urinary tract infections (32%), surgical site infections (22%), pneumonia (15%), and bloodstream infections (14%). The most common microorganisms associated with the types of infections are *Escherichia coli*, *Enterococcus* species, *Staphylococcus aureus*, Coagulase-negative staphylococci, or *Pseudomonas aeruginosa*. (secondary) Urinary tract infections occur when one or more of microorganisms enter the urinary system and affect the bladder and/or the kidneys.⁵

Needlestick injuries, which lead to the transmission of viral infestations like Hepatitis B, Hepatitis C, and HIV virus, are a potentially serious threat to students during their clinical postings. Exposure to infectious disease patient's blood, and hazardous body fluids is one of the most frequently reported injury events by medical students at a

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health science center.⁶

The undergraduate medical education is the formative phase and appropriate moment for acquiring the necessary knowledge and skills. There is lack of evidence regarding explicit infection control training in the curriculum of most medical undergraduate courses, which needs to be assessed.⁷

This study was undertaken to assess the knowledge, awareness and attitude of the medical students toward basic infection control practices, such as standard precautions, hand hygiene, respiratory hygiene, cough etiquette, tuberculosis control, use of personal protective modalities, and the learning of approaches that help improve their knowledge and practices.

2. Review of Literature

Robert Weinstein et al.⁸ in their comparative study on nosocomial infections at present and in the past, showed that there had been a reduction in number of cases of nosocomial infections, however the numbers of death were still high. According to them poor hygiene standards in most health centers have contributed to this. Cases of medical practitioners overlooking basic hygienic measures such as a proper hand washing when attending to patients was one of the common cause. They observed some medical services like injections were not administered in a proper manner. This is due to unqualified medical expertise especially in small health care centers which lead to infections.

Tony rizzo et al. in their research observed respiratory procedures, intravenous (IV) procedures, surgery and wound and urinary bladder catheterization as the common types of infections acquired in hospital. They said that most hospital-acquired UTIs happen after urinary catheterization. A catheter picks up bacteria that may be in or around the urethra and take them up into the bladder hence infecting it.

Jessica Lietz et al. in their research on nosocomial infections with emphasis on the causes and preventive measures for the infections observed that, there were higher rates of infections in public hospitals as compared to private health centers. They showed lack of adequate public education on the infections was a key factor in the spread of infections. For instance one may visit a patient suffering from an air borne disease and contact the disease without knowing. Similarly patients may share personal items such as towels, not knowing that they are subjecting themselves to harmful infections. They thought enlightening the public in general on the dangers of these infections and the basic control measures like maintaining a high personal hygiene can go a greater mile in trying to control these infections.

Sheetal Sharma et al.⁹ In their research on health system infection control measure in developing countries, highlighted three overarching lessons related to infection control and maternal mortality reduction. despite limited evidence on effective infection control measures during

labour and delivery and from low resource settings, it appears that education, surveillance, organisational change and quality improvement interventions should be introduced, confirming the need for a health systems approach to reduce maternal mortality, especially in relation to sepsis. There is the need to improve our understanding of organisational and behavioural change to effectively implement infection control measures. Finally, globalized, targeted health policies or initiatives have the potential to bring attention to, and catalyse action for what is currently a neglected, but important cause of maternal death worldwide.

Savanthe AM et al¹⁰ observed that knowledge of the medical students regarding infection source is adequate but infection prevention practices was relatively less particularly needle stick injury prevention, hand hygiene techniques, blood borne infection control. Hospitals should reinforce the knowledge of universal precaution continually and recommended performing infection control education programs at the college level before starting the clinical practice years along with seminars and feedback, highlighting importance of IPC guidelines to increase safety of our graduates and patients. Education should be enhanced by peers, seniors, and HCWs by acting as role models of infection control.

3. Aim

To study the awareness of hospital acquired infections amongst undergraduate medical students and to determine the underlying common causative factors.

4. Objectives

1. To determine the awareness of infections amongst medical students in relation to hospital and its preventive measures.
2. To find out the causative factors leading to these infections in undergraduate medical students.
3. To assess knowledge of medical students on infection control policy and procedures.

5. Materials and Methods

The present study is a cross-sectional study. Approval was taken from the Institutional Ethics Committee (IEC) of Rohilkhand Medical College & Hospital, Bareilly before commencement of study. Informed consent was obtained prior to the study participation.

5.1. Study population

The population of the study comprised of undergraduate medical students of Rohilkhand Medical College & Hospital, Bareilly.

5.2. Inclusion criteria

All MBBS students of our medical college who voluntarily participated in the study.

5.3. Exclusion criteria

All the students who have completed their internship and those who were not willing to participate in the study.

5.4. Study tool

The study was done using pre-coded, predesigned, closed-end online questionnaire which covered the following-

1. Regarding the variables: Knowledge of common infections acquired in the hospital, common route of acquiring these infections, common causative factors leading to infections, knowledge of preventive measures and associated control policy.
2. Information regarding:
 - Attitude of medical students towards common acquired hospital infections.
 - Knowledge of common routes of acquiring infections.
 - Knowledge of measures to prevent common infections.
 - Awareness of importance of precautions and cleanliness against hospital infections.

5.5. Methodology

A cross sectional study was conducted in Rohilkhand Medical College & Hospital, Bareilly on students of MBBS course. The sampling was done using convenient sampling. The identity of the study participants were kept confidential and anonymous. The survey was done online using a pre-coded, pre-designed, close end questionnaire which mainly focussed on the information about awareness of acquiring hospital based infections.

5.6. Data collection

Questionnaire data was collected online via Google forms.

5.6.1. Data analysis

Data analysis was done by using MS EXCEL and SPSS 25.0.

5.7. Implications

The study gave an idea of prevailing infections amongst medical students and common routes of entry. This will help in further planning of proper control measures to curb these, so as to reduce the prevalence of hospital acquired infections amongst medical students.

6. Results

A total of three hundred twenty students were invited to fill the questionnaire. Out of these, 250 medical students responded to the survey. Most students were in the age group of 21-25yrs -(66.8%), followed by 15-20yrs (28%). A total of 205 students (82%) were aware about hospital acquired infections while the rest were either uncertain or unaware.

250 responses

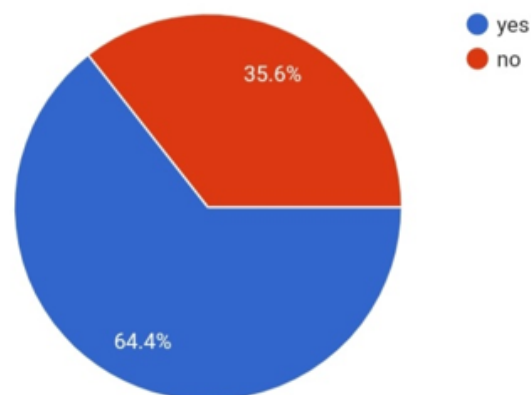


Fig. 1: Do you wear watch, jewellery, ring bracelets?

250 responses

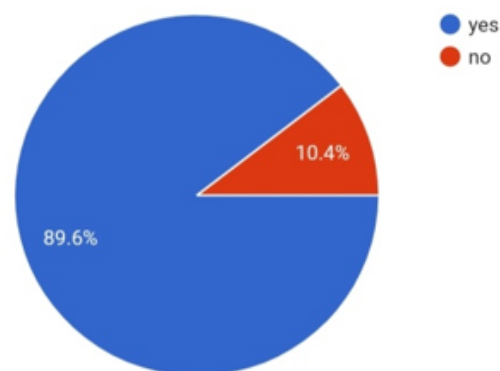


Fig. 2: Do you use uniform according to hospital policy?

235 students (94%) strongly believe that health care workers are at risk of acquiring nosocomial infections though only (68%) had formal training in Hand Hygiene & Control against infections. Hand hygiene is an important health care measure to reduce hospital acquired infections & most hospitals have Infection Control policy as standard protocol for implementation.

There were mixed responses on various hand hygiene measures. 90.8% agreed that they use disinfectants when

250 responses

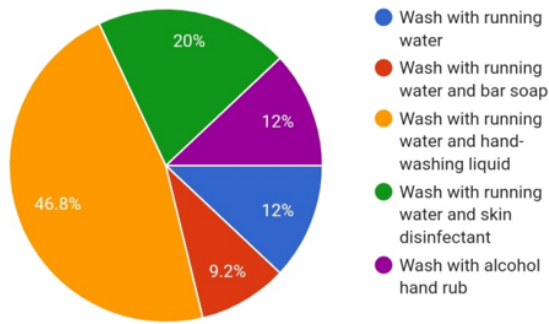


Fig. 3: How do you usually wash your hands while ON DUTY?

250 responses

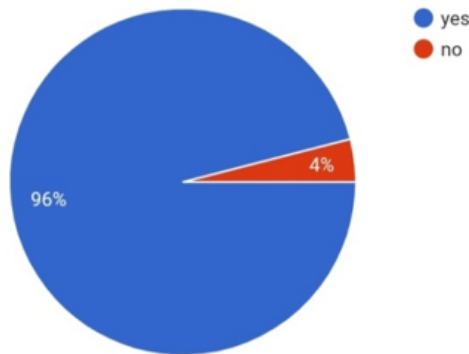


Fig. 4: Do you think it is necessary for medical students to be trained in hand hygiene?

in contact with patients, while only (51.2%) used gloves. Alcohol hand rub was more commonly used (72.8%). Approximately (10.4%-18.4%) students were found to be not following the various dress codes protocols for prevention (details in diagram).

7. Discussion

Nosocomial infections are an important health issue globally and exposure to infectious diseases is a frequently identified occupational hazard faced by medical students.

Preventive measures for such infections through adequate knowledge and awareness are important requirements for all medical students.

In this prospective study on 250 medical students of Rohilkhand Medical College and Hospital, we explored students' knowledge and awareness by using a question based survey. The response rate of the students was 78% as not all of them responded to questionnaire. There were some wrong answers for some of the questions showing presence

250 responses

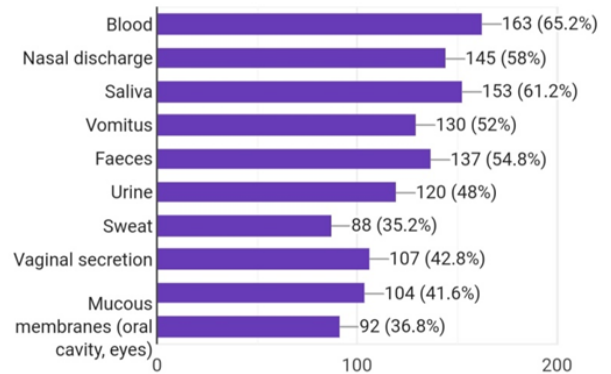


Fig. 5: Which of the followings from the patients do you assume to be infectious?

250 responses

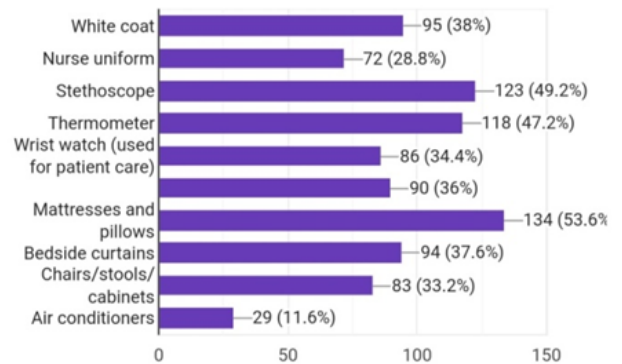


Fig. 6: Which of the followings are recognized sources of HCAs?

250 responses

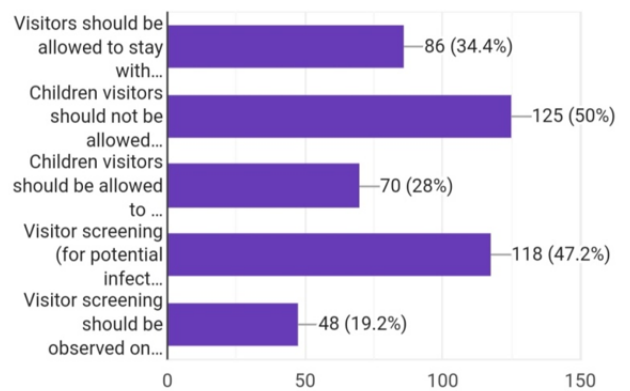


Fig. 7: With regard to visitor management in hospital settings, which of the following is/are correct?

of defects in their knowledge. Our results showed that 82% of students are aware of hospital acquired infections and their preventive measures, which include proper hand hygiene, safety during contact with patients and safe use and disposal of sharps.^[b] Other study by Ibrahim AA. et al. showed a low awareness (48.44%)^c, while study by Kadi AA. et al. showed 57.1% average awareness. An increased rate in our country might be due to various awareness programs and advertisements through government policies.

250 responses

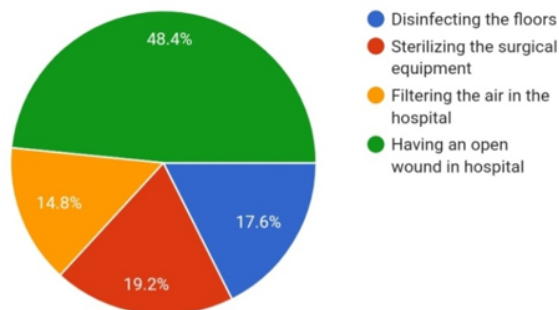


Fig. 8: Which of the following would predispose one to getting a nosocomial infection?

250 responses

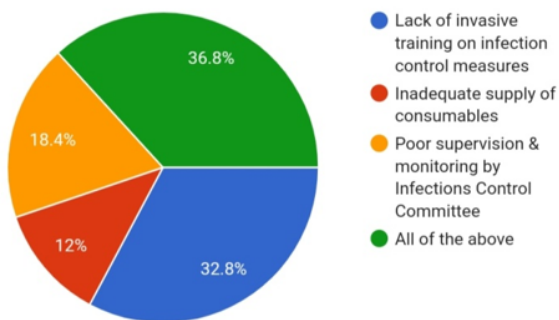


Fig. 9: Do you feel your hospital has?

Hand hygiene forms a major preventive measure in control of nosocomial infections. Our medical students were aware of washing hands before and after contact with patients (90.8%) and used gloves everytime (51.2%). Less number of students may be using gloves because of financial constraints. Kadi AA et al. in their study also showed (36-41.5%) of students using gloves. We recommend training students on importance of hand hygiene through proper teaching methodology.

We observed that amongst common causes, patients with open wound are a frequent source of infection to medical students followed by unsterile surgical equipments and dirty

hospital floors.

A large percentage (68%) of our medical students had a desire for formal training for prevention of nosocomial infections. This was also observed by Zahrani SA et al in their study (78.5%) this indicates importance of implementation of continuous training through infection control policy for all medical students in health care workers. Better strategies should be planned and implemented against nosocomial infections. Though a good number of students were aware of about existing infection control policy in the hospital (75.6%) but lack of invasive training (32.8%) in adequate supply of consumables (12%), poor supervision and monitoring by Control Committee (18.4%), or all these factors combined (36.8%) were all-together causing high prevalence of hospital acquired infections.

250 responses

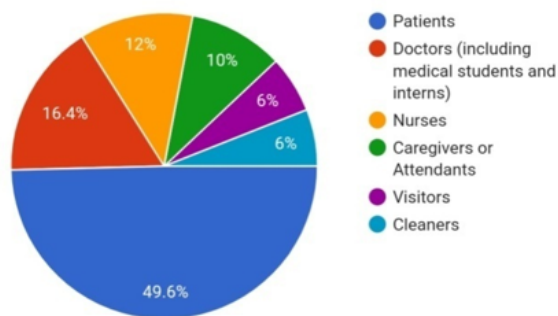


Fig. 10: Which is the most important source/reservoir of health care associate infections (HCAI)?

250 responses

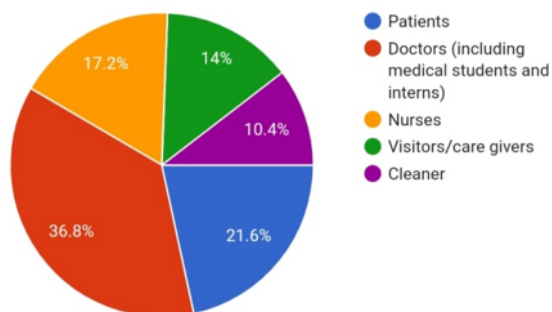


Fig. 11: Which population is most susceptible to health care associated infections (HCAI)?

Many studies have analysed health care workers at risk to these infections our observations show that doctors including medical students and interns (36.8%) are at maximum risk, followed by near -by patients

(21.6%), nurses (17.2%), and visitors & patient attendants (14%). Hospital cleaning staff are also at risk of acquiring various infections. Therefore medical university should take necessary action to inform, educate and vaccinate the health care workers who may be at risk. Vaccination against viral infection should be made mandatory for all health professionals.

250 responses

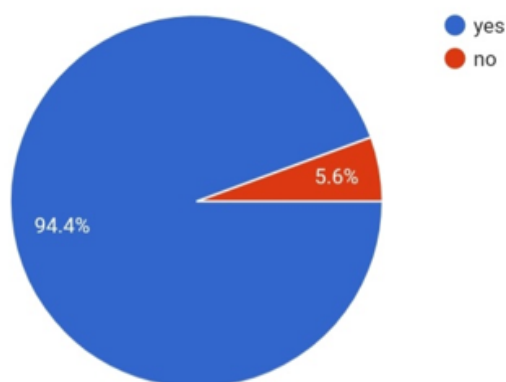


Fig. 12: Do you desire for the training on knowledge of standard precautions in hospital?

8. Source of Funding

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9. Conflict of Interest

The authors declare they have no conflict of interest.

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