International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Gupta R. Int J Reprod Contracept Obstet Gynecol. 2024 Oct;13(10):2717-2722
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20242801

Original Research Article

An assessment of knowledge regarding hospital acquired infection prevention among health care workers in a government medical college, UP, India

Rashmi Gupta*

Department of Obsretrics and Gynecology, GMC Kannuaj, Uttar Pradesh, India

Received: 23 July 2024
Accepted: 30 August 2024

***Correspondence:**
Dr. Rashmi Gupta
E-mail: drrashmigupta14@gmail.com

ABSTRACT

Background: This study aimed to assess the status of knowledge and practice aspects regarding infection control and prevention among Health care workers in a tertiary health care facility of Uttar Pradesh.
Methods: It was an observational cross section study conducted between April 2023 to June 2023 in a government medical college involving 179 health care workers. Data was collected on the basis of pre tested questionnaire through interview of health care workers. Questionnaire was divided into three-part, first part containing question related to demographic parameter of study participants and second and third part contained questions regarding knowledge and practice of standard infection control measures respectively.
Results: Majority of participants were above 34 years (66.66%) female health worker (73.6%).72% participants were in the category of faculty member and nursing staff with average experience of more than 9 year. Study shows that100% of faculty members, resident doctors, and nursing staff were having the knowledge regarding steps of hand wash before surgical procedure and hand hygiene procedure before and after patient care. 100% of faculty members, resident doctors and nursing staff said that they perform all steps of hand wash before surgical procedure, perform hand hygiene before and after patient care.
Conclusion: This study demonstrates a commendable level of adherence to infection control measures among healthcare workers. The high levels of compliance observed in our study may be attributed to institutional policies, ongoing training, or other factors unique to our setting.

Keywords: Infection prevention, Health care worker, Hand hygiene, Knowledge of infection prevention, Practice of infection prevention, Standard infection control measures, Hospital acquired infection

INTRODUCTION

Healthcare-associated infections (HAI) are infections people get while they are receiving health care for another condition. HAI can happen in any health care facility, including hospitals, ambulatory surgical centres, end-stage renal disease facilities, and long-term care facilities.1 Hospital-acquired infections may lead to multidrug-resistant infections, so to identify the risk factors of HAI is very important. Evidence from countries shows that, despite being vital for safe health delivery, hand hygiene practices at the point of care remain suboptimal worldwide.[2] Out of every 100 hospitalized patients, seven patients in advanced countries and ten patients in emerging countries acquire an HAI.[3] Other studies conducted in high-income countries found that 5%-15% of the hospitalized patients acquire HAI which can affect from 9% to 37% of those admitted to intensive care units (ICUs).[4,5] Several hospitals have established infection tracking and surveillance systems in place, along with

robust prevention strategies to reduce the rate of hospital-acquired infections.[6] Universal standard (Infection control) measures, such as hand washing with soap and water or using alcohol-based disinfectant before and after each patient visit, are vital in reducing rates of transmission of MDR pathogens.[7] HAI contribute to increased length of hospital stay high mortality, high health care costs and economic burden on families, communities and countries at large.

Hence prevention and control of HAI appear as a critical public health concern.[8,9] The WHO reported that improper environmental hygiene and waste disposal procedures, poor infrastructure, inadequate equipment and manpower, overcrowding, limited knowledge and poor practices of basic infection control measures, and lack of national guidelines are the key determinants of HAIs.[10]

In this context, we aimed to assess the status of knowledge and practice aspects regarding infection control and prevention among Health care workers in a tertiary health care facility of Uttar Pradesh.

Aim of the study was to assess the knowledge and practice regarding infection control and prevention among health care service providers in medical college of Uttar Pradesh, India. Objectives were to assess the knowledge related to infection control and prevention measures among faculty members, resident doctors and nursing staff. To assess practices related to infection prevention and control measure among health care workers in hospital.

METHODS

Study type

It was a cross sectional, observational Study.

Study duration

Duration of the study was from April 2023 to June 2023.

Study location

Study was conducted at Government Medical College Kannauj, Uttar Pradesh, India.

Study Population

Health care workers (faculty members, resident doctors, nursing staff) working at Medical College.

Sample size

faculty members, resident doctors and nursing staff who gave consent for the interview were included in the study 179 participants participated in the study. Mode of Sample selection was convenience sampling technique.

Pretesting and validation of questionnaire

A pilot study was conducted prior to the study using structured questionnaire, as per findings and need of the study questionnaire was modified and retested. This retested questionnaire was used for the study purpose. Questionnaire has following three parts. Subject demographic details. Questions regarding knowledge of infection control measures and guidelines. Questions regarding practice of infection control measures.

Inclusion criteria

Faculty members, resident doctors and nursing staff who gave consent were included in this criterion.

Exclusion criteria

The exclusion criteria include health care workers who did not gave consent.

Ethical clearance

The Study was approved by the Institutional Ethics Committee, Government Medical College Kannauj.

Statistical analysis

Data was analysed using Microsoft excel 2016 spread sheets.

RESULTS

Present study was a descriptive cross-sectional study conducted at GMC Kannauj UP from April 2023 to June 2023. In our study total 179 healthcare worker were interviewed regarding their knowledge and practice of infection control measures in patient management along with their demographic detail. Demographic study shows that out of 179 participants 60 (33.33%) were under 34 years age group and remaining 119 (66.66%) were above 34 years of age group.

Also depicts that 47 (26.38%) participants were male and rest were the females (73.6%) (Table 1). Out of 179 health workers there were 53 faculty members, 59resident doctors and 67 nursing staff. Faculty members had 9.58 years of mean work experience, whereas resident doctors and nursing staff had 2.56 and 10.5 mean years of experience respectively. Formal training in infection prevention and control was acquired by 41.51% of faculty members, 59.32% of doctors and 38.81% of nursing staff (Table 2).

When we compared knowledge of standard infection prevention control measures, 100% of faculty members, resident doctors, and nursing staff were having the knowledge regarding steps of hand wash before surgical procedure and hand hygiene procedure before and after patient care. Regarding steps of donning and doffing of

PPE kit 100% faculty members, 84. 91 % resident doctors and 89.55% of staff nurse have the knowledge. For question gloves must be worn every time during handling potentially infectious materials 100% of faculty members and resident doctors gave correct response whereas 92.53% of nursing staff gave the correct response. Correct response for question "alcohol-based rubs are use after removing gloves" from faculty, resident doctors and nursing staff was respectively 94.33%, 84.74%, 83.58%. Correct response for question "mask must be placed on coughing patients to prevent potential dissemination of infectious" from faculty, resident doctors and nursing staff was respectively 94.33%, 86.44%, 92.54%. Regarding question "Surgical masks can protect from infections during procedures likely to generate splashes or sprays of blood and body fluids". 100% of faculty, 94.92% resident doctors and 95.52% of nursing staff gave correct response. When asked for knowledge of infection prevention due to wearing of proper gown 100% of faculty members, resident doctors and nursing staff gave correct response.

Table 1: Demographic details of study participants.

Age (years)	Participants (n=179)	%	Sex	Participants (n=179)	%
<34	60	33.3	male	47	26.3
=>34	119	66.6	female	132	73.6

Table 2: Type of health care worker their experience and training of study subjects.

S. no.	Working as	Numbers	Mean work experience in years	Formal training in infection prevention and control
1.	Faculty members	53	9.58	22 (41.51%)
2.	Resident doctors	59	2.56	35 (59.32%)
3.	Nursing staff	67	10.5	26 (38.81%)

Table 3: Questions regarding knowledge of infection control measure.

S. no.	Knowledge of	Working as		
		Faculty members correct response N (%)	Resident doctors correct response N (%)	Nursing staff correct response N (%)
1.	Steps of hand wash before surgical procedure	53 (100)	59 (100)	67 (100)
2.	Procedure of hand hygiene before and after patient care	53 (100)	59 (100)	67 (100)
3.	Steps of donning and doffing of PPE Kit	53 (100)	45 (84.91)	60 (89.55)
4.	Gloves must be worn every time during handling potentially infectious materials	53 (100)	53 (100)	62 (92.53)
5.	Alcohol-based rubs are used after removing gloves.	50 (94.33)	50 (84.74)	56 (83.58)
6.	Mask must be placed on coughing patients to prevent potential dissemination of infectious	50 (94.33)	51 (86.44)	62 (92.54)
7.	Surgical masks can protect from infections during procedures likely to generate splashes or sprays of blood and body fluids	53 (100)	56 (94.92)	64 (95.52)
8.	Infection prevention due to wearing proper gown	53 (100)	59 (100)	67 (100)
9.	Stationary, telephones kept in wards, and doorknobs can be sources of infections	51 (96.23)	57 (96.61)	62 (92.54)
10.	Recapping of needles, in general, is not appropriate	49 (92.45)	51 (86.44)	50 (74.63)
11.	Segregation of clinical and non-clinical waste is important for preventing the spread of Infection	53 (100)	59 (100)	64 (95.52)
12.	Guideline for disposal of biomedical waste	53 (100)	59 (100)	57 (85.07)
13.	Isolation precaution is one of the elements in standard precaution	49 (92.45%)	54 (91.52%)	51 (76.12%)

Table 4: Questions regarding practice of infection control measure.

S.no.	Practice of	Working as		
		Faculty members correct response N (%)	Resident doctors correct response N (%)	Nursing staff correct response N (%)
1.	Perform all steps of hand wash before surgical procedure	53 (100)	59 (100)	67 (100)
2.	Perform hand hygiene before and after patient care	53 (100)	59 (100)	67 (100)
3.	Always wears gloves when drawing blood samples	53 (100)	59 (100)	67 (100)
4.	Always wears gloves when handling impaired patient skin	49 (92.45)	59 (100)	64 (95.55)
5.	Always performs hand hygiene after taking off gloves	53 (100)	59 (100)	67 (100)
6.	Always washes hands immediately after contacting anybody fluid	53 (100)	59 (100)	67 (100)
7.	Always wears gloves when performing parenteral injections of medications	51 (96.23)	56 (94.92)	65 (97.01)
8.	Always wears gloves when dressing wounds	53 (100)	59 (100)	67 (100)
9.	Always wears mask when performing operations/procedures that might induce the spraying of blood, body fluid, secretions, or excretions	53 (100)	59 (100)	67 (100)
10.	Always wears goggles when performing operations/procedures that might induce the spraying of blood, body fluid, secretions, or excretions	53 (100)	59 (100)	67 (100)
11.	Always wears protective suits or gown when performing operations/procedures that might induce spraying of blood, body fluid, secretions, or excretions	53 (100)	59(100)	67 (100)
12.	Don't recap needles	53 (100)	59 (100)	67 (100)
13.	Segregate clinical and non-clinical waste at point of waste generation	53 (100)	59 (100)	67 (100)
14.	Throw biomedical waste in appropriate bin	53 (100)	59 (100)	67 (100)

It was found that 96.23% of faculty members, 96.61% of resident doctors and 92.54 % of nursing staff knew stationary, telephones kept in wards, and doorknobs can be sources of infections. For item "Recapping of needles, in general, is not appropriate" respectively 92.45%, 86.44%, 74.63% of faculty, resident doctors and nursing gave correct response. For item "Segregation of clinical and non-clinical waste is important for preventing the spread of" respectively 100%, 100%, 95.52% of faculty, resident doctors and nursing staff gave correct response.100% of faculty member and resident doctors whereas 85.07% of nursing staff agreed regarding having knowledge for guideline for disposal of biomedical waste. Regarding Item "Isolation precaution" 92.45% of faculty members, 91.52% of resident doctors and 76.12% of nursing staff were having knowledge (Table 3). Table 4 shows observation regarding practices of infection control measures among faculty members, resident doctors and staff nurse. It was agreed by 100% of faculty members, resident doctors and nursing staff that they perform all steps of hand wash before surgical procedure, perform hand hygiene before and after patient care, always wears gloves when drawing blood samples. Whereas when asked that, do they always wear gloves when handling impaired patient skin, 92.45% of faculty members, 100% of resident doctors and 95.55% of nursing staff agreed. It was also revealed that 100 % of faculty members, resident doctors always perform hand hygiene after taking off gloves whereas only 78.57% of nursing staff practice this. Regarding, always practicing hand wash immediately after contacting anybody fluid 100% of the respondents agreed but when asked do you always wears gloves when performing parenteral injections of medications 96.23% of faculty members, 94.92% of resident doctors and 97.01% of nursing staff agreed. It was also found that 100% of respondents always wears gloves when dressing wounds, always wears mask when performing operations/procedures that might induce the spraying of blood, body fluid, secretions, or excretions, always wears goggles when performing operations/procedures that might induce the spraying of blood, body fluid, secretions, or excretions, always wear protective suits or gown when

performing operations/procedures that might induce spraying of blood, body fluid, secretions, or excretions, don't practice recapping of needles, segregate clinical and non-clinical waste at point of waste generation and throw biomedical waste in appropriate bin.

DISCUSSION

Present study was a descriptive cross-sectional study conducted at GMC Kannauj UP from April 2023 to June 2023. In our study total 179 healthcare worker were interviewed regarding their knowledge and practice of infection control measures in patient management along with their demographic details.

From our study it was evident that majority of participants were above 34 years (66.66%) female health worker (73.6%).72% participants were in the category of faculty member and nursing staff with average experience of more than 9 years (Table 1 and 2).

In the assessment of healthcare workers' knowledge of infection control measures, our study yielded noteworthy results. Table 3 presents a comprehensive breakdown of their responses of their understanding of various critical aspects of infection prevention. Firstly, it is encouraging to note that 100% of faculty members, resident doctors, and nursing staff demonstrated a strong understanding of the steps involved in hand-washing before surgical procedures and hand hygiene before and after patient care.

This universal knowledge underscores the commitment of healthcare professionals at GMC Kannauj to fundamental infection control practices. All other findings regarding knowledge collectively underscore the commendable knowledge levels among healthcare professionals at GMC Kannauj concerning crucial infection control measures. However, it's important to recognize that knowledge alone does not guarantee compliance with best practices rather the translation of this knowledge into actual clinical practices to ensure the highest standards of infection control and patient safety are consistently maintained.

The assessment of healthcare workers' practices in infection control measures among faculty members, resident doctors, and nursing staff At GMC Kannauj revealed a commendable adherence to best practices, as depicted in Table 4. It is noteworthy that 100% of faculty members, resident doctors, and nursing staff reported consistently performing all the essential steps of hand-washing before surgical procedures, including hand hygiene before and after patient care. Other findings regarding practices highlight the dedication and adherence of healthcare professionals at GMC Kannauj to infection control measures. While our study reveals commendable practices among healthcare workers, it's essential to acknowledge that self-reported practices may differ from actual observed practices. Future research could explore the alignment between self-reported practices and observed behaviours to gain a more comprehensive understanding of infection control practices in clinical settings.

In comparing our research results to other studies in the field of infection control among healthcare workers, several key findings and trends emerge. These comparisons serve to contextualize our findings and provide valuable insights into the broader landscape of infection control practices in healthcare settings.

Hand hygiene and glove use

Our study found that 100% of faculty members, resident doctors, and nursing staff consistently practiced hand hygiene before and after patient care and wore gloves during certain procedures. This aligns with the high standard of hand hygiene compliance reported in various studies.[11-13] In contrast, some previous research has identified variability in hand hygiene practices among healthcare workers, with compliance rates ranging from 30% to 70%.[14,15] Our findings, with universal compliance, demonstrate a remarkable commitment to hand hygiene at GMC Kannauj.

Personal protective equipment (PPE) use

In terms of PPE use, our study indicated that healthcare workers consistently donned appropriate PPE during procedures that could lead to exposure to bodily fluids. This level of adherence is in line with recommendations from organizations like the World Health Organization (WHO).[8,13] Other studies have reported mixed results regarding PPE use. Some have found suboptimal adherence to PPE guidelines among healthcare workers, highlighting the need for continuous education and reinforcement of proper practices.[14,15]

Needle safety and waste management

Our research revealed that healthcare workers at GMC Kannauj consistently do not recap needles and practice proper biomedical waste management. These practices are essential for minimizing the risk of needle stick injuries and the spread of infections. Previous studies have indicated that needle stick injuries remain a concern in healthcare settings.[13,14] Our findings underscore the importance of promoting safe needle practices and waste management protocols.

Knowledge and practice discrepancies

While our study found strong alignment between healthcare workers' knowledge and practices, it is worth noting that some research has identified disparities between knowledge and actual behaviors.[14] In such cases, healthcare workers may be aware of infection control guidelines but may not consistently apply them in practice due to non-availability of resources in low-income settings.

Gender and experience

Our study reported a higher proportion of female healthcare workers (73.6%), which is consistent with the gender distribution in the healthcare workforce.[16] The average experience of more than 9 years among participants in our study aligns with research indicating that healthcare workers with more experience tend to have better infection control practices.[17,18]

Limitation of the study was that none of the subjects were observed for their infection prevention control practices. It is assumed that they might be practicing whatever they are responding or claiming, so the data may not be absolute, it only provides an insight. There can be chances of false claiming of conduction of infection control practices. Other limitation was that, not all the faculty members, nursing staff and resident doctors of the medical college participated in the study, which may have led to a better conclusion.

CONCLUSION

Our findings at GMC Kannauj demonstrate a commendable level of adherence to infection control measures among healthcare workers. However, it's essential to recognize that variations in compliance exist across different healthcare settings and regions. The high levels of compliance observed in our study may be attributed to institutional policies, ongoing training, or other factors unique to our setting. Nonetheless, these findings provide valuable insights into best practices that can inform the development of infection control interventions and guidelines for healthcare workers." Despite the positive aspects of our study, it is essential to acknowledge its limitations. These may include the relatively small sample size, potential response bias and the single institution focus.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Health Care Associated Infections. Available at: https://www.hhs.gov/oidp/topics/health-care. Accessed on 17th April 2024.
2. First-ever WHO research agenda on hand hygiene in health care to improve quality and safety of care. Available at https://www.who.int/news/item. Accessed on 17th April 2024.
3. Brennan TA, Leape LL, Laird NM. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. N Engl J Med. 1991;324(6):370-6.
4. World alliance for patient safety. The global patient safety challenge 2005-2006. Clean care is safer Care. Geneva WHO. Available at: http://www.who.int/gpsc. Accessed on 4th April 2018.
5. Vincent JL. Nosocomial infections in adult intensive-care units. Lancet. 2003;361(9374):2068-77.
6. Habboush Y, Yarrarapu SNS, Guzman N. StatPearls Publishing;Treasure Island. 2023. Infection control. Available at: https://www.ncbi.nlm.nih.gov/books.
7. Alberto F, Muppidi MV, Regunath H. Hospital-acquired infections. Available at: https://www.ncbi.nlm.nih.gov/books. Accessed on 17th April 2024.
8. World Health Organization. Report on the burden of endemic health care-associated infection worldwide: a systematic review of the literature. world health organization. Geneva, Switzerland: 2011. Available at: https://www.who.int/publications. Accessed on 17th April 2024.
9. Andersson AE, Bergh I, Karlsson J, Nilsson K. Patients experiences of acquiring a deep surgical site infection: An interview study. Am J Infect Control. 2010;38:711-7.
10. World Health Organization. Health Care-Associated Infections. WHO. Geneva, Switzerland. 2016. Available at: https://www.ncbi.nlm.nih.
11. Debbarma M, Gogoi S, Jais M, Gupta P, Sharma P, Kaur R. Knowledge, attitude and practice of standard precautions among the health care workers of a tertiary care teaching hospital of North India. Int J Contemp Med Res. 2015;2:1282-5.
12. Okechukwu EF, Motshedisi C. Knowledge and practice of standard precautions in public health facilities in Abuja, Nigeria. Int J Infect Control. 2012:8.
13. Darawad MW, Hussami M. Jordanian nursing students' knowledge of, attitudes towards, and compliance with infectioncontrol precautions. Nurse Educ. 2013;33:580-3.
14. Alharbi G, Shono N, Alballaa L, Aloufi A. Knowledge, attitude and compliance of infection control guidelines among dental faculty members and students in KSU. BMC Oral Health. 2019;19:7.
15. Ghadmgahi F, Zighaimat F, Ebadi A, Houshmand A. Knowledge, attitude and self-efficacy of nursing staffs in hospital infections control. J Mil Med. 2011;13:167-72.
16. Ahmari AM, AlKhaldi YM, Al-Asmari BA. Knowledge, attitude, and practice about infection control among primary care professionals in Abha City, Kingdom of Saudi Arabia J Fam Med Prim Care. 2021;10:662-8.
17. Oh E, Choi JS. Factors influencing the adherence of nurses to standard precautions in South Korea hospital settings. Am. J Infect Control. 2019;47:1346-51.

Cite this article as: Gupta R. An assessment of knowledge regarding hospital acquired infection prevention among health care workers in a government medical college, UP, India. Int J Reprod Contracept Obstet Gynecol 2024;13:2717-22.