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Awareness and Knowledge of Hand Hygiene among Interns at a Tertiary Care Hospital – Questionnaire-Based Study

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ABSTRACT

Background: Hand hygiene is globally recognized as a critical intervention in the prevention of healthcare-associated infections (HCAIs). Despite widespread awareness campaigns, compliance with hand hygiene practices among healthcare workers, particularly medical interns, remains suboptimal.

Objectives: This study aimed to assess the level of awareness and knowledge regarding hand hygiene among Compulsory Rotatory Medical Interns (CRMIs) at a tertiary care teaching hospital, to identify areas of strength and weakness, and to determine the association between knowledge scores and variables such as gender, previous training, and department of posting.

Methods: A cross-sectional questionnaire-based study was conducted over two months among 70 CRMIs using the WHO Hand Hygiene Knowledge Questionnaire for Health-Care Workers (2009 revision). Descriptive statistics, chi-square tests, and knowledge scoring systems were employed. Data analysis was performed using SPSS version 26.

Results: Among the 70 participants, 64.3% had received formal hand hygiene training within the past three years. Knowledge scores were categorized as good (28.6%), moderate (50%), and poor (21.4%). Significant knowledge gaps were noted regarding the minimum recommended duration for alcohol-based handrub (42% correct) and the appropriate indications for handwashing versus hand rubbing (60% correct before clean/aseptic procedures).

Conclusion: Although a moderate level of hand hygiene knowledge was observed among interns, gaps persist in crucial areas. Targeted, mandatory hand hygiene education, periodic assessments, and reinforcement at every clinical posting are recommended to bridge these gaps and enhance patient safety practices.

1. INTRODUCTION

Healthcare-associated infections (HCAIs) remain a significant cause of morbidity, mortality, and healthcare costs worldwide [1]. Hand hygiene, recognized as the cornerstone of infection control, is a simple yet highly effective measure to prevent the spread of infections within healthcare settings [1,2]. The World Health Organization (WHO), through initiatives like the "SAVE LIVES: Clean Your Hands" campaign, continues to emphasize the critical importance of proper hand hygiene among healthcare professionals [2,19,22].

Despite its proven effectiveness, studies consistently demonstrate low compliance rates with hand hygiene protocols across different cadres of healthcare workers [3,4,5]. Medical interns, or Compulsory Rotatory Medical Interns (CRMIs), are at a particularly crucial juncture in their training — transitioning from academic learning to hands-on patient care. Their awareness, knowledge, and practices regarding hand hygiene are vital not only for immediate infection control but also for fostering lifelong professional habits [3,5].

While numerous global studies have explored hand hygiene compliance among healthcare workers, there remains a relative paucity of data focusing specifically on interns within the Indian healthcare context [5,20]. Thus, this study was conducted to evaluate the awareness and knowledge of hand hygiene practices among CRMIs at a tertiary care teaching hospital using the validated WHO Hand Hygiene Knowledge Questionnaire [2].

Objectives:

1. To assess the level of knowledge regarding hand hygiene among CRMIs using the WHO Hand Hygiene Knowledge Questionnaire.
2. To identify specific areas of strength and weakness in hand hygiene knowledge.
3. To evaluate the association between hand hygiene knowledge scores and variables such as gender, previous hand hygiene training, and department of posting.

2. MATERIALS AND METHODS

Study Design: A hospital-based, cross-sectional questionnaire-based study.
Study Setting: A tertiary care teaching hospital.
Study Population: Seventy Compulsory Rotatory Medical Interns (CRMIs) currently undergoing internship training in tertiary care hospital.
Study Duration: Two months.
Inclusion Criteria

- All CRMIs posted in various clinical departments during the study period who provided written informed consent.

Exclusion Criteria

- Interns who refused participation.
- Interns submitting incomplete questionnaires.

Study Tool

The WHO Hand Hygiene Knowledge Questionnaire for Health-Care Workers (Revised August 2009) was employed to assess knowledge (2).

Data Collection Procedure:

Participants were briefed regarding the study objectives and confidentiality measures. Informed consent was obtained. Questionnaires were distributed in printed form, and participants were given 20–30 minutes to complete them anonymously without any external assistance.

Sample Size Calculation:

The sample size was calculated using the formula for prevalence studies:
n=Z2×p×(1−p) d2n = \frac {{Z^2 \times p \times (1-p)}} {{d^2}} n=d2Z2×p×(1−p)
Where:

- **Z** = 1.96 (95% confidence interval)
- **p** = 0.5 (Assumed prevalence of good knowledge due to lack of prior data)
- **d** = 0.1 (Margin of error, 10%)

Calculation's= (1.96)2×0.5×0.5(0.1)2=96.04n = \frac {{(1.96) ^2 \times 0.5 \times 0.5}} {(0.1) ^2} = 96.04n= (0.1)2(1.96)2×0.5×0.5=96.04
Due to time and logistical constraints, a convenience sample of 70 interns was enrolled.

Statistical Analysis:
Data were entered into Microsoft Excel and analysed using SPSS version 26. Descriptive statistics were used to summarize categorical variables (frequency and percentages) and continuous variables (mean ± SD).Knowledge scores were categorized as:

- Good knowledge (≥80% correct responses)
- Moderate knowledge (60–79%)
- Poor knowledge (<60%)

Chi-square tests were used to explore associations between knowledge scores and demographic variables (gender, previous training, department). A p-value of <0.05 was considered statistically significant.

3. RESULTS

Table 1: Demographic Characteristics of Participants (n=70)

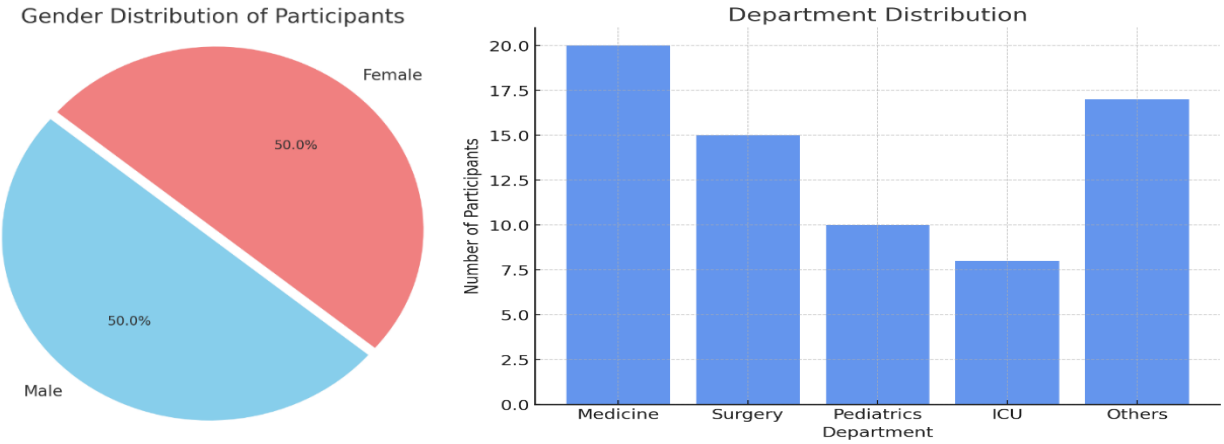
Variable	Category	Frequency (%)
Gender	Male	35 (50%)
	Female	35 (50%)
Received Hand Hygiene Training	Yes	45 (64.3%)
	No	25 (35.7%)
Department	Medicine	20 (28.6%)
	Surgery	15 (21.4%)
	Pediatrics	10 (14.3%)
	ICU	8 (11.4%)
	Others	17 (24.3%)

Table 2: Knowledge Scores among Participants

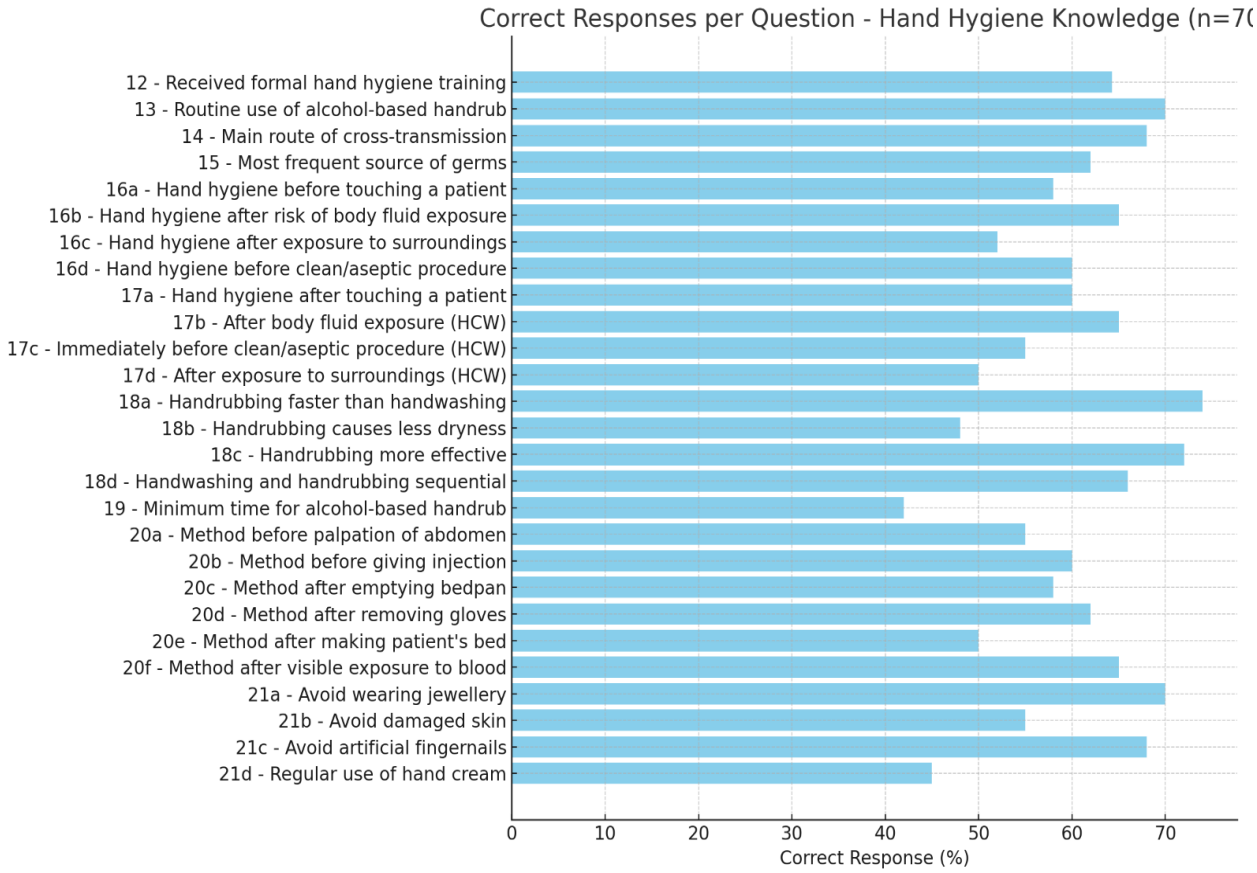
Knowledge Score	Number (%)
Good (≥80%)	20 (28.6%)
Moderate (60–79%)	35 (50%)
Poor (<60%)	15 (21.4%)

Table 3: Knowledge Gaps Identified

Question Item	Correct Response (%)
Minimum time for alcohol-based handrub (20 seconds)	42%
Hand hygiene before a clean/aseptic procedure	60%
Recognition of hands as primary route of cross-transmission	68%



Graph Representation of Correct Responses per Question



A total of 70 interns participated in the study. The demographic details are summarized in **Table 1.** Among participants, 64.3% reported receiving formal hand hygiene training within the last three years, and 70% reported routinely using an alcohol-based handrub.

Analysis of knowledge scores revealed that 28.6% of participants demonstrated **good** knowledge (score ≥80%), 50% showed **moderate** knowledge (score 60–79%), and 21.4% had **poor** knowledge (score <60%) shown in **Table 2.**

Detailed question-wise analysis (**Table 4)** showed areas of both strength and knowledge gaps:

- **Recognition of hands** as the main route of cross-transmission of germs was correctly identified by 68% of participants.
- **Identification of the most frequent source of germs** (germs already present on or within the patient) was correct in 62% of responses.
- Knowledge of hand hygiene actions preventing germ transmission **to the patient** and **to the health-care worker** varied from 50% to 65% correct responses across different indications.
- **Understanding of alcohol-based handrub usage** was relatively strong, with 74% acknowledging that handrubbing is more rapid than handwashing, and 72% recognizing that it is more effective against germs.
- However, only 42% of participants correctly identified **20 seconds** as the minimum time required for alcohol-based handrub to kill most germs, representing a significant gap.
- Regarding specific situations requiring hand hygiene, correct responses ranged between 50–65%, with lower scores noted for procedures like bedpan handling and glove removal.
- Awareness regarding practices that should be avoided (e.g., wearing jewellery, having artificial fingernails) to prevent hand contamination was moderate, with correct responses between 55–70%.

Key Knowledge Gaps

- Despite an overall moderate level of knowledge among interns, several critical gaps were identified. A substantial proportion of participants (58%) were unaware of the recommended minimum duration (20 seconds) for effective alcohol-based handrub.

- Only about half recognized the need for hand hygiene after exposure to the surroundings of a patient, and confusion was evident regarding correct hand hygiene actions after glove removal and after minor patient care activities such as bed-making.
- Additionally, misconceptions persisted regarding the comparative efficacy and skin safety of hand rubbing versus handwashing. These findings highlight the need for targeted educational interventions focusing on these specific deficiencies to ensure optimal compliance with hand hygiene practices in clinical settings.

4. DISCUSSION

This study assessed the awareness and knowledge of hand hygiene practices among interns at a tertiary care hospital, using the WHO Hand Hygiene Knowledge Questionnaire [2]. Our findings revealed that while most interns demonstrated moderate knowledge, significant gaps persisted, particularly regarding critical hand hygiene practices essential for preventing healthcare-associated infections (HAIs) [1,3].

The proportion of participants who demonstrated good knowledge (28.6%) was comparable to findings from previous studies conducted among healthcare workers in similar settings, where good knowledge levels typically ranged from 25–35% [1,5,6]. Notably, 64.3% of the interns reported receiving formal hand hygiene training, underscoring the importance of structured educational programs in shaping awareness [5,22]. However, the persistence of knowledge gaps despite training suggests a need for more frequent reinforcement and practical demonstrations [2,20].

Consistent with earlier studies [3,4,23], recognition of healthcare workers' hands as the main route for cross-transmission was relatively high (68%), indicating a satisfactory understanding of transmission dynamics. However, only 42% correctly identified the minimum recommended duration for alcohol-based handrub application, a critical detail emphasized in WHO guidelines [2,8]. This is concerning, as inadequate duration undermines the effectiveness of hand hygiene practices.

Misconceptions about specific indications for hand hygiene were observed, particularly regarding actions after exposure to the patient's environment and after glove removal [5,7]. Similar trends have been documented in studies by **Jain et al. (6) and Pessoa-Silva et al.** highlighting that compliance drops significantly when the perceived risk is low.

Knowledge regarding the advantages of hand rubbing over handwashing, including faster action and reduced skin irritation, was reasonably good among participants [26]. Nevertheless, about half of the respondents were unclear about the role of skin-friendly practices, such as the use of hand cream and avoidance of damaged skin, in preventing microbial colonization [27].

These findings highlight the pressing need for targeted, practical, and repetitive hand hygiene training sessions, supported by visual reminders and continuous feedback mechanisms [22]. Given the pivotal role of interns in direct patient care, enhancing their knowledge and compliance with hand hygiene protocols is essential for patient safety and infection control [1,2,20].

5. CONCLUSION

The present study highlights that while interns at a tertiary care hospital possess a moderate level of knowledge regarding hand hygiene practices, significant gaps remain in critical areas. Inadequate understanding of the minimum duration for alcohol-based handrub, confusion about indications for hand hygiene, and misconceptions about skin protection practices were particularly notable. Addressing these gaps is crucial, as hand hygiene remains the most effective and simple measure to prevent healthcare-associated infections.

6. RECOMMENDATIONS

1. Reinforcement of Training: Implement periodic refresher courses focusing on key hand hygiene principles, especially emphasizing the "5 Moments for Hand Hygiene."

2. Practical Demonstrations: Conduct hands-on workshops and simulations to bridge the gap between theoretical knowledge and actual practice.

3. Visual Reminders: Display posters and reminder systems in clinical areas to promote compliance with hand hygiene protocols.

4. Monitoring and Feedback: Establish regular audits of hand hygiene practices among interns, with constructive feedback to improve compliance.

5. Promoting a Culture of Safety: Foster a hospital environment where hand hygiene is consistently modeled by senior staff and is part of routine patient care.A comprehensive, multifaceted approach is essential to ensure that future healthcare professionals internalize the principles of effective hand hygiene and apply them consistently in clinical practice.

REFERENCES

1. World Health Organization (WHO). WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009.

2. Erasmus V, et al. Systematic review of studies on compliance with hand hygiene guidelines in hospital care. Infect Control Hosp Epidemiol. 2010;31(3):267-77.
3. Mathur P. Hand hygiene: Back to the basics of infection control. Indian J Med Microbiol. 2011;29(1):6-16.
4. Kumar S, et al. Awareness and compliance of hand hygiene practices among healthcare workers in a tertiary care hospital. J Infect Public Health. 2021;14(5):596-602.
5. Jain N, et al. Hand hygiene compliance in a tertiary care hospital: A prospective study. Indian J Public Health. 2016;60(3):228-31.
6. Pessoa-Silva CL, et al. Infection control measures for preventing the spread of nosocomial infections in the ICU: An evidence-based approach. Crit Care Med. 2007;35(9):1999-2004.
7. Boyce JM, Pittet D. Guideline for hand hygiene in healthcare settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. MMWR Morb Mortal Wkly Rep. 2002;51:1-44.
8. Kampf G, Kramer A. Epidemiologic background of hand hygiene and evaluation of the most important agents for scrubs and rubs. Clin Microbiol Rev. 2004;17(4):863-93.
9. Daniels IR, Rees BI. Handwashing: simple, but effective. Ann R Coll Surg Engl. 1999;81:117-8.
10. Labarraque AG. Instructions and observations regarding the use of the chlorides of soda and lime. In: Porter J, editor. New Haven, CT: Baldwin and Treadway; 1829.
11. Semmelweis I. Etiology, concept, and prophylaxis of childbed fever. In: Carter KC, editor. 1st ed. Madison, WI: The University of Wisconsin Press; 1983.
12. Rotter ML. 150 years of hand disinfection-Semmelweis' heritage. Hyg Med. 1997;22:332-9.
13. Mortimer EA, Wolinsky E, Gonzaga AJ, Remmelkamp CH. Role of airborne transmission in Staphylococcal infections. BMJ. 1966;1:319-22.
14. Steere AC, Mallison GF. Handwashing practices for the prevention of nosocomial infections. Ann Intern Med. 1975;83(5):683-90.
15. Garner JS, Favero MS. CDC guideline for handwashing and hospital environmental control, 1985. Infect Control. 1986;7(5):231-43.
16. Hospital Infection Control Practices Advisory Committee (HICPAC) Recommendations for preventing the spread of vancomycin resistance. Infect Control Hosp Epidemiol. 1995;16:105-13.
17. Pratt RJ, Pellowe C, Liveday HP, Robinson N, Smith GW, Barrett S. The EPIC project: developing national evidence-based guidelines for preventing healthcare-associated infections. J Hosp Infect. 2001;47(Suppl A):S3-82.
18. Stone SP. Hand hygiene: the case for evidence-based education. J R Soc Med. 2001;94(6):278-81.
19. Allegranzi B, Storr J, Dziekan G, Leotsakos A, Donaldson L, Pittet D. The First Global Patient Safety Challenge "Clean Care is Safer Care": from launch to current progress and achievements. J Hosp Infect. 2007;65(Suppl 2):115-23.
20. Magiorakos AP, Suetens C, Boyd L, Costa C. National hand hygiene campaigns in Europe, 2000-2009. Euro Surveill. 2009;14:ii–19191.
21. WHO guidelines for hand hygiene in health care (Advanced draft). Geneva: WHO; 2006. Available from: http://www.who.int/gpsc/tools/en/
22. Kilpatrick C, Allegranzi B, Pittet D. The global impact of hand hygiene campaigning. Euro Surveill. 2009;14:ii–19191.
23. Noble WC. Dispersal of skin microorganisms. Br J Dermatol. 1975;93:477-85.
24. Smith SMS. A review of hand-washing techniques in primary care and community settings. J Clin Nurs. 2009;18:786-90.
25. Canada: Laboratory Centre for Disease Control, Bureau of Infectious Diseases; 1998. Infection control guidelines. Communicable Dis Rep.
26. Larson E. Skin hygiene and infection prevention: more of the same or different approaches? Clin Infect Dis. 1999;29:1287-94.
27. Larson E. A causal link between handwashing and risk of infection: Examination of the evidence. Infect Control Hosp Epidemiol. 1988;9:28-36.
28. Peacock JE, Marsick FJ, Wenzel RP. Methicillin-resistant Staphylococcus aureus: Introduction and spread within a hospital. Ann Intern Med. 1980;93:526-32.