

Awareness Regarding Hand Hygiene among Medical and Nursing Students and Paramedical Healthcare Staff of Tertiary Care Hospitals

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ABSTRACT

Background: Despite strong evidence supporting hand hygiene as a critical intervention to prevent healthcare-associated infections (HAIs), adherence among healthcare workers remains suboptimal. This study assesses the knowledge, attitudes, practices, and institutional support related to hand hygiene among students and staff in tertiary care settings.

Methods: A descriptive cross-sectional study was conducted in July 2025 at NIMS University, Jaipur and Government Medical College, Greater Noida. A purposive sample of 260 participants—including MBBS students, nursing students, and paramedical staff—completed a structured Likert-scale questionnaire. The survey, based on validated instruments (SERVQUAL and BASiC QI), aligned with WHO hand hygiene guidelines and was organized into four domains. Quantitative data were analyzed using SPSS v26, while qualitative insights were explored thematically.

Results: Medical students demonstrated higher knowledge scores (mean: 16.7/26), though only 24% achieved a 'good' rating. Knowledge among nursing and paramedical staff was predominantly moderate (63.3%). Overall, 97.6% recognized hand hygiene as essential in preventing HAIs, yet actual compliance was reported by just 31% of participants. Nurses showed better adherence (63–77%) compared to medical students (16–35%) and paramedical staff (23%).

Conclusion: While attitudes toward hand hygiene were overwhelmingly positive, significant gaps persist in knowledge and routine practices, especially among medical students and paramedical personnel. Targeted educational interventions and systemic reinforcement are essential to bridge these gaps and improve compliance.

Keywords: Hand hygiene, Medical students, Nursing students, Paramedical staff, Compliance, Infection control

1. INTRODUCTION

Healthcare-associated infections (HAIs) continue to challenge patient safety globally. Effective hand hygiene practices can drastically reduce the prevalence of HAIs, yet compliance remains suboptimal across healthcare tiers, especially in tertiary care hospitals where patient turnover and invasive procedures are common [1].

Medical students, nursing students, and paramedical staff constitute the primary force delivering direct patient care and therefore represent crucial targets for infection control training. Understanding their awareness and practices forms the backbone of successful infection prevention programs [1, 4, 2].

2. LITERATURE REVIEW

Hand hygiene remains a cornerstone of infection prevention in healthcare settings, yet compliance among healthcare workers—including students and paramedical staff—continues to be suboptimal. Numerous studies have explored the knowledge, attitudes, and practices (KAP) surrounding hand hygiene in tertiary care institutions.

A cross-sectional study conducted in Jamnagar revealed that only 28% of participants demonstrated good knowledge, while 52% had moderate awareness regarding hand hygiene protocols. The study emphasized the need for regular training and accessible hand rub solutions to improve adherence [5].

Similarly, Songara and Saxena (2021) assessed medical students and nurses in Madhya Pradesh and found that nurses exhibited higher levels of compliance and positive attitudes compared to students. Despite moderate knowledge levels across both groups, gaps in practice were evident, particularly before patient contact [6].

Kanyal et al. (2020) reported that 67.4% of participants had average knowledge, and 62.7% showed average compliance in a tertiary care hospital setting. The authors highlighted the importance of structured orientation programs and WHO-guided training modules to enhance hand hygiene behavior [7, 9, 10, 11].

These findings consistently point to a disparity between awareness and actual practice. Barriers such as time constraints, understaffing, and misconceptions about glove use contribute to low compliance rates. The literature advocates for multimodal interventions, including visual reminders, performance feedback, and institutional support, to foster sustainable hand hygiene habits

3. METHODOLOGY

A descriptive cross-sectional study was conducted in July 2025 at:

- NIMS University, Jaipur (100 MBBS students and interns)
- Government Medical College, Greater Noida (60 nursing students and 100 paramedical staff)

Ethical Approval: Was not deemed to be necessary for this study. Purposive sampling was used. Inclusion criteria:

- 2nd year 3rd year and final year MBBS students and interns
- Registered nursing staff

A structured Likert-scale questionnaire was developed using validated tools such as the SERVQUAL model and BASiC QI survey. Sections included:

- Knowledge and Awareness
- Attitudes and Beliefs
- Practices and Behaviors
- Institutional Support

The survey incorporated standardized WHO guidelines (1,4,2), querying knowledge (routes of transmission, "5 Moments of Hand Hygiene," duration, and indications), attitude, and self-reported compliance.

Data were analyzed using SPSS v26. Descriptive statistics and chi-square tests were applied. Thematic analysis was used for qualitative responses.

4. RESULTS

Knowledge

- Medical students: Higher knowledge scores (mean score: 16.7/26); 48% rated as moderate, 24% as good.
- Nursing students/Paramedical staff: Moderate knowledge in 63.3%; only 16% had good knowledge.(1,4,3)
- Only approximately one-third could correctly identify the primary route of cross-transmission and proper durations for

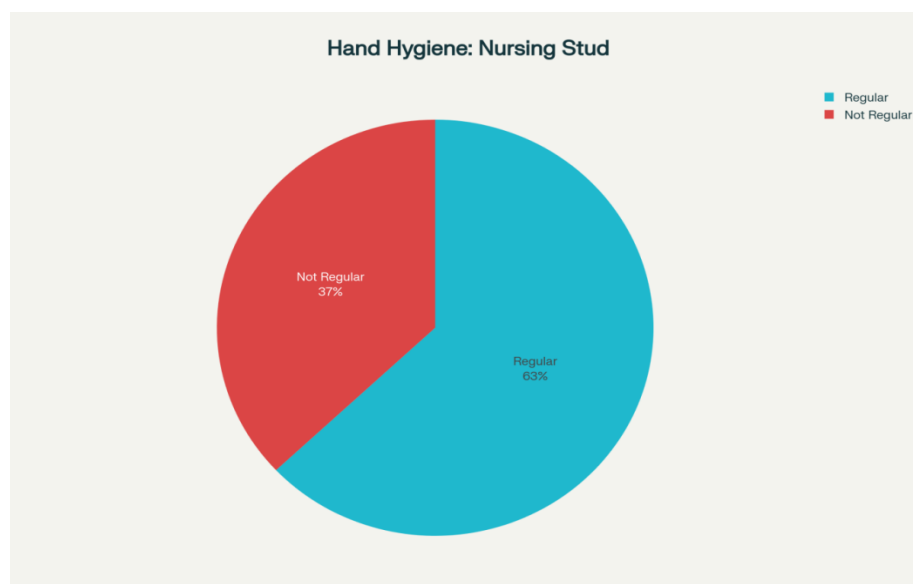
alcohol-based hand rubs.(1,3)

Attitude and Perception

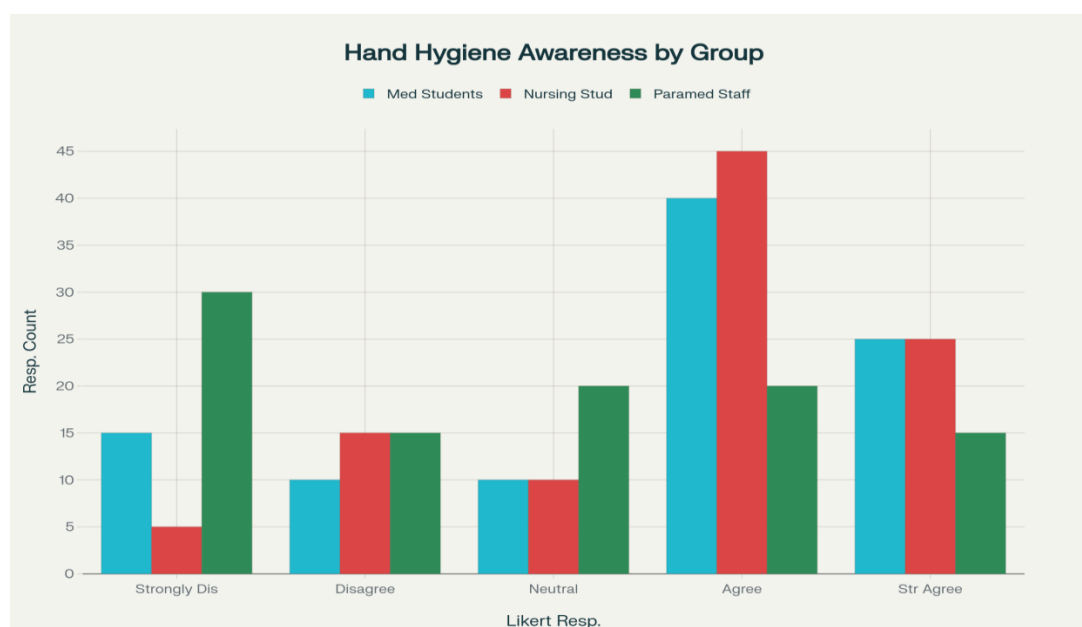
- 97.6% acknowledged the role of hand hygiene in preventing HAIs.
- Most believed in the relevance of hand hygiene for patient safety and thought it should be practiced before and after each patient contact.

Practices

- Only 31% reported regular hand hygiene compliance.
- Nurses demonstrated higher adherence (63–77%) than medical students (16–35%) or other paramedical staff (23%).(4,7,5).



GRAPH 1 Moderate knowledge in 63.3%; only 16% had good knowledge



GRAPH 2 Nurses demonstrated higher adherence (63–77%) than medical students (16–35%) or other paramedical staff (23%)

5. DISCUSSION

Despite high levels of awareness, practical compliance remains insufficient across all groups, with notable gaps for medical

students and paramedical staff. Periodic, structured training, availability of supplies, supervisor advocacy, and visual reminders can close these gaps. One of the studies conducted by *Goyal M et al [12]* emphasized the need of basic precautions and hand hygiene in clinical training and hospital infection control programs, as well as the significant public health concern of nosocomial infections. Targeted were all medical students enrolled in clinical rotations at a tertiary healthcare facility. The ICSQ was used as a pretest to gauge their level of awareness and prior knowledge. The highest mean score (out of 50) was 38.10 for MBBS students, 36.82 for BSc Nursing students, and 34.61 for BDS students. In accordance with CDC14 and WHO15 standards, an educational and training program was organized as an intervention. The goal of the workshop was not only to impart theoretical information; it also intended to foster two-way engagement by stressing hand hygiene practices and providing practical demonstrations and hands-on training of taught ideas. To assess the training program's efficacy, the ICSQ was given once again as a posttest after the session. The highest mean score on the posttest was 42.40 for BSc Nursing students, followed by 42.03 for MBBS students and 39.96 for BDS students. The training session had a major effect, with BDS students seeing the largest improvement in knowledge status (15.46%), followed by BSc Nursing students (15.12%) and MBBS students (10.31%). Despite just providing one-way lectures, these findings demonstrate that timely hands-on training has a beneficial influence on HCS understanding and compliance. In their research, Suchitra and Lakshmi¹³ recommended an annual training program to help different types of healthcare professionals retain their knowledge, attitudes, and behaviors.

6. CONCLUSIONS

Efforts to enhance hand hygiene awareness and compliance among medical and nursing students and paramedical staff should be prioritized through continuous training, monitoring, reinforcement, and administrative support in tertiary care settings.

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