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TO ASSES AWARENESS AND COMPLIANCE OF HAND HYGIENE AMONG UNDERGRADUATE MEDICAL STUDENTS OF KONASEEMA INSTITUTE OF MEDICAL SCIENCES AND RESEARCH FOUNDATION

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ABSTRACT

Hand hygiene is a fundamental practice in infection control, yet compliance among healthcare students remains a challenge. This study evaluates the awareness and adherence to hand hygiene protocols among medical students during Objective Structured Clinical Examination (OSCE) sessions. A total of 94 students (54 males, 40 females) participated, with data collected on their knowledge and compliance across five critical moments of hand hygiene. Results indicated that while 51.06% of students demonstrated awareness, actual compliance was significantly lower, with an overall adherence rate of 14.4% (13.8% among males and 15% among females). Statistical analysis using a Chi-square test found no significant association between gender and hand hygiene awareness ($p = 0.954$). However, a comparison between awareness and compliance rates revealed a significant discrepancy ($p < 0.05$), suggesting that knowledge does not necessarily translate into practice. These findings emphasize the need for more effective educational interventions and behavioral reinforcement strategies to enhance hand hygiene compliance among healthcare students.

KEYWORDS :

INTRODUCTION

Healthcare-associated infections (HAIs) are a major challenge for healthcare systems globally, leading to increased morbidity, prolonged hospital stays, higher healthcare costs, and, in severe cases, patient mortality. The World Health Organization (WHO) estimates that at any given time, 7% of hospitalized patients in developed countries and 10% in developing countries acquire at least one healthcare-associated infection. In India, studies have reported the prevalence of HAIs ranging from 11% to 30%, depending on the healthcare setting and patient population.

Proper hand hygiene is universally recognized as the single most effective measure to prevent HAIs. Despite its simplicity and effectiveness, compliance with hand hygiene protocols remains suboptimal across healthcare facilities. According to WHO data, average global hand hygiene compliance among healthcare workers is only 40% to 60%. In India, compliance rates have been reported as low as 20% to 40% in some healthcare settings, despite awareness of the importance of hand hygiene in infection prevention.

To combat this issue, the WHO introduced the "My Five Moments for Hand Hygiene" approach, providing healthcare workers with clear guidance on when to perform hand hygiene to reduce the risk of infection transmission. The five key moments are:

1. Before touching a patient
2. Before clean/aseptic procedures
3. After body fluid exposure/risk
4. After touching a patient
5. After touching patient surroundings

Undergraduate MBBS students frequently engage in patient care during clinical postings and are expected to adhere to infection control practices, including hand hygiene. However, several studies conducted in India and other countries have demonstrated that medical students often have inadequate knowledge and poor compliance regarding hand hygiene. A study conducted in a tertiary care hospital in India reported that while 80% of medical students were aware of hand hygiene guidelines, only 37% practiced hand hygiene consistently during patient interactions.

KIMS Amalapuram, as a prominent medical teaching institution, recognizes the importance of instilling proper infection control practices in its students to ensure patient safety and professional competency. This study aims to:

- Assess the level of awareness of the WHO's Five Moments for Hand Hygiene among undergraduate MBBS students at KIMS Amalapuram.
- Evaluate the actual compliance of these students with hand hygiene practices in clinical settings.
- Identify barriers to proper hand hygiene adherence and suggest targeted interventions to improve compliance

Aim

The study aims to assess the awareness and compliance levels of hand hygiene practices among medical students and to identify the gap between knowledge and actual adherence to hygiene protocols.

Objectives

1. To evaluate the awareness of hand hygiene practices among male and female medical students based on their knowledge of key moments for hand hygiene.
2. To measure the actual compliance rate of medical students with recommended hand hygiene protocols during clinical sessions.
3. To compare awareness and compliance levels and analyze whether higher awareness translates into better hygiene practices.
4. To assess gender-based differences in hand hygiene awareness and compliance, determining if there is a statistically significant variation.
5. To identify key barriers to hand hygiene compliance, such as workload, forgetfulness, or lack of reinforcement.
6. To provide recommendations for improving hand hygiene adherence through institutional policies, behavioral interventions, and training programs.

By understanding these factors, the study seeks to contribute to the ongoing efforts to minimize HAIs and promote a culture of patient safety within the institution.

MATERIALS AND METHODS

A cross-sectional study was conducted among undergraduate students at the Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh. The study was approved by the institution's research and ethics committee and carried out in February 2025.

Study Population

A total of 94 undergraduate medical students participated in the study, comprising 54 males and 40 females. Prior to participation, informed consent was obtained from all students.

Data Collection

Data was collected using a structured questionnaire designed to assess students' knowledge and attitude toward hand hygiene. The questionnaire was distributed through Google Forms and contained multiple-choice questions, including 'Yes,' 'No,' and 'Not Sure' options.

The questionnaire assessed students' awareness regarding hand hygiene in various hospital scenarios, including:

- Before examining a patient
- Before collecting a blood sample
- Before performing a dressing
- After touching patient surroundings
- Before wearing gloves

Compliance Assessment

Hand hygiene compliance was evaluated using a direct observational approach during Objective Structured Clinical Examination (OSCE) sessions. Each student had five opportunities to perform hand hygiene. Compliance was recorded using a 'Yes' or 'No' response for each instance.

Statistical Analysis

Data were analyzed using descriptive statistics to determine awareness and compliance rates. A Chi-square test was conducted to assess the relationship between gender and hand hygiene awareness. Additionally, a statistical test was performed to compare awareness rates with actual compliance rates, with significance set at $p < 0.05$.

Hand Hygiene Awareness Table

Moments of Hand Hygiene	Male Students (n=54) Yes	Male Students (n=54) No	Male Students (n=54) Not Sure	Female Students (n=40) Yes	Female Students (n=40) No	Female Students (n=40) Not Sure
Before examining the patient	27	15	12	22	6	12
Before collecting the blood sample	28	8	18	26	3	13
Before performing dressing	24	16	14	21	7	11
After touching patient surroundings	27	12	15	23	3	14
Before wearing gloves	22	16	16	20	4	16

Summary Table: Average and Percentage of Averages with respect to n

Category	Average	% (Average/n)
Male Yes	25.6	47.41%
Male No	13.4	24.81%
Male Not Sure	15	27.78%
Female Yes	22.4	56.0%
Female No	4.6	11.5%
Female Not Sure	13.2	33.0%

Combined Averages and Percentages

Response Category	Combined Average (Male + Female)	% (Average / 94)
Yes (Known)	48.0	51.06%
No (Not Known)	18.0	19.15%
Not Sure	28.2	30.0%

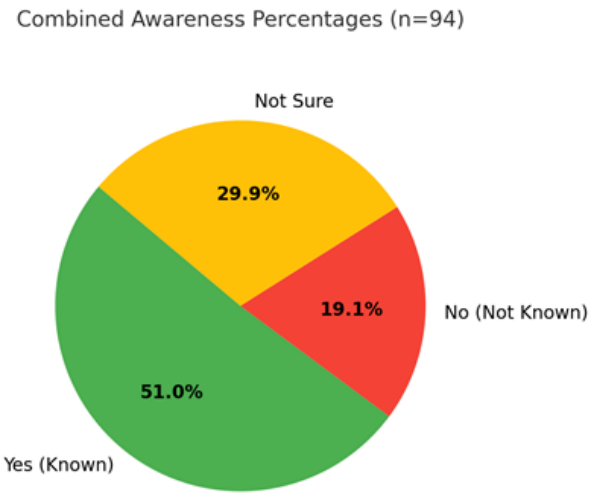


Figure: Combined Awareness Percentages Pie Chart (n=94)

Statistically Analysis

A Chi-Square test for independence was conducted to examine the relationship between gender and hand hygiene awareness responses.

Chi-Square Test Results:
- p-value: 0.954

Since the p-value (0.954) is greater than the common significance level of 0.05, we fail to reject the null hypothesis. This suggests that there is no statistically significant association between gender and hand hygiene awareness responses.

Hand Hygiene Compliance Report

Hand Hygiene Compliance Report
Compliance to Hand Hygiene

Category	Before examination	Before blood sample	Before dressing	After touching surroundings	Before wearing gloves	P value
Compliant	16	17	18	5	11	4.63e-08
Non compliant	78	77	76	89	83	

Hand Hygiene Compliance Among Students
Participants:
- 54 male students
- 40 female students

Each student had 5 potential opportunities to perform hand hygiene during OSCE sessions.

Observed Compliance:
- Male students: Performed hand hygiene in 35 out of 255 occurrences (13.8% compliance)
- Female students: Performed hand hygiene in 32 out of 215 occurrences (15% compliance)
  Overall Compliance Rate: 14.4% for all students

Statistical Analysis

No significant difference among genders ($P < 0.05$)

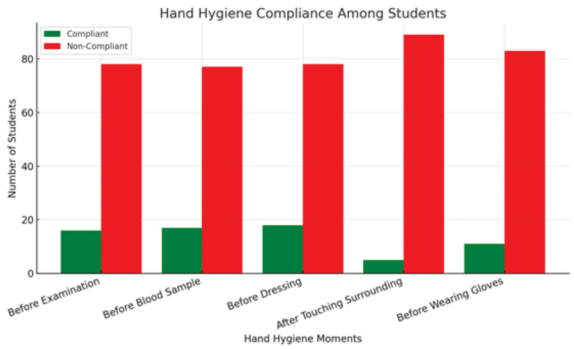
Statistical Analysis

A statistical test was conducted to compare the compliance rate (14.4%) with the average awareness rate (50.6%) of hand hygiene.
- Calculated p-value: 4.63e-08

Since the p-value is significantly lower than 0.05, this indicates

a statistically significant difference between compliance and awareness rates

Bar Graph Representation of Compliance to Hand Hygiene



DISCUSSION

The findings of this study indicate that while hand hygiene awareness among students is relatively high (51.06%), actual compliance is significantly lower (14.4%).

This discrepancy is consistent with findings from previous studies that highlight the gap between knowledge and practice in infection control.

For example, a study by Pittet et al. (2000) found that healthcare professionals often recognize the importance of hand hygiene but fail to adhere to recommended practices due to factors such as workload, forgetfulness, and lack of immediate reinforcement. Similarly, research by Erasmus et al. (2010) reported that despite high awareness levels, compliance rates among medical students and healthcare workers ranged between 5% and 40%, often influenced by environmental and behavioral factors.

Another comparable study by Ariyarathne et al. (2013) in a South Asian medical school found that although more than 80% of students acknowledged the importance of hand hygiene, only about 20% followed the recommended practices consistently. This aligns with the findings of the present study, where awareness is significantly higher than compliance.

The results also reveal no significant gender-based differences in hand hygiene awareness and compliance, as confirmed by a Chi-square test (p-value: 0.954).

This is similar to findings in studies such as those by Srigley et al. (2014), which reported no substantial gender disparities in hand hygiene practices among healthcare workers. However, some studies have indicated slight variations, with female students sometimes demonstrating better compliance, possibly due to greater concern for hygiene-related behaviors (Megeus et al., 2015). The current study does not support such a trend, suggesting that institutional or cultural factors may play a more significant role than gender differences.

The statistical analysis further supports a significant difference between awareness and actual compliance (p-value: 4.63e-08), reinforcing the notion that knowledge alone does not translate into practice. Studies such as those by Whitby et al. (2007) emphasize that behavioral interventions, institutional support, and strict monitoring are crucial to bridging this gap.

CONCLUSION

The study highlights a substantial disparity between awareness and compliance with hand hygiene practices among medical students. Despite over half of the students being aware of the key moments for hand hygiene, actual adherence remains alarmingly low. This underscores the need for targeted interventions such as stricter enforcement of hygiene protocols, reinforcement through repeated training, and addressing behavioral barriers to compliance.

Furthermore, the lack of a significant gender difference suggests that efforts to improve hand hygiene compliance should be universally applied rather than being gender-specific. Future studies could explore factors such as environmental conditions, institutional policies, and motivational strategies to improve adherence rates. By strengthening both awareness and implementation strategies, medical institutions can significantly reduce the risk of healthcare-associated infections and enhance patient safety.

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