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Assessment of Knowledge, Attitude and Practice of Hand Hygiene among undergraduate Medical and Nursing Students in the Bundelkhand Medical College Sagar (M.P)

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ABSTRACT

Background: Hand hygiene is a fundamental component of infection prevention in healthcare settings. Despite its proven efficacy, compliance remains suboptimal, particularly among healthcare students.

Objective: To assess and compare the knowledge, attitude, and practice (KAP) of hand hygiene among undergraduate medical and nursing students at Bundelkhand Medical College, Sagar (M.P), India.

Methods: A cross-sectional study was conducted involving 100 undergraduate students (50 medical and 50 nursing). Data were collected using a self-administered, WHO-based questionnaire assessing hand hygiene knowledge (16 items, True/False), attitude (14 items, Yes/No), and practice (13 items, Yes/No). Statistical analysis was performed using SPSS software. Z-test was applied to assess differences between the two groups, with a p-value < 0.05 considered statistically significant.

Results: A majority (84%) of students reported receiving formal training in hand hygiene. Nursing students demonstrated significantly better knowledge (70.6%) compared to medical students (66.5%) ($p < 0.05$). Attitude scores were also higher among nursing students (91.1%) than medical students (82.57%). Similarly, nursing students exhibited better hand hygiene practices (78.6%) than medical students (73.2%) ($p < 0.05$). Several individual items showed statistically significant differences favouring nursing students.

Conclusion: While both medical and nursing students showed awareness and positive attitudes toward hand hygiene, nursing students had significantly better knowledge and practices. This highlights the need to enhance hand hygiene education and practical training among medical students to ensure effective infection control.

Keywords: Hand hygiene, medical students, Nursing students, Knowledge, Attitude, Practice, Infection control

INTRODUCTION

Hand hygiene is one of the most effective measures to prevent the spread of infections, particularly in healthcare settings[1]. Hand hygiene is the cornerstone of infection prevention and control, and proper hand hygiene can reduce healthcare-associated infections by up to 50%. Despite its proven effectiveness, compliance with hand hygiene practices among healthcare professionals and students remains suboptimal[2]. Medical and nursing students, as future healthcare providers, play a crucial role in infection control. During their clinical training, they come into close contact with patients, making it imperative that they possess adequate knowledge, maintain a positive attitude, and demonstrate proper hand hygiene practices[3].

In India, studies have reported varying levels of awareness and compliance with hand hygiene practices among healthcare students[4,5,6]. An observer found that although 74% of medical students were aware of WHO guidelines, only 37% practiced correct hand hygiene routinely. Similarly, another observer found that while 80% of nursing students had a favourable attitude towards hand hygiene, only 45% adhered to proper practices.

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The WHO's "My Five Moments for Hand Hygiene" outlines critical moments when healthcare workers should perform hand hygiene to reduce pathogen transmission[7]. These moments include before touching a patient, before aseptic procedures, after exposure to body fluids, after touching a patient, and after touching patient surroundings[8]. Effective education and awareness among undergraduate medical and nursing students are essential to bridge the gap between knowledge and practice.

MATERIAL AND METHODOLOGY

This cross-sectional study was conducted in Bundelkhand Medical College and hospital, a tertiary care teaching hospital located in Sagar, MP, India. It provides medical care for residents of Sagar and patients referred from neighbouring districts.

The participants included undergraduate students from the MBBS and BSc Nursing courses who were enrolled in clinical training during the study period. Participants were explained the content and nature of the study. Verbal consent was obtained from 50 medical and 50 nursing students who volunteered to participate. A self-administered questionnaire containing a set of questions regarding hand-hygiene knowledge attitudes, and practices was distributed to all participants.

The questionnaire was developed based on WHO guidelines on hand hygiene with knowledge was assessed with Performa of 16 questionnaire with choice of True or False options[9]. Attitude and practice were assessed using another self-structured questionnaire which consists of 14 and 13 questions respectively. Respondents were given the choice of Yes or No options. The questionnaire was filled by the respondents in electronic format. Data was analysed using SPSS version software. Descriptive statistics was used to calculate percentages for each of the responses given. Z test was used to compare the percentage of correct responses between medical and nursing students. A P-value less than 0.05 was considered significant.

RESULTS

There was a total of 100 study participants (50 nursing students and 50 medical students). In this a majority (84%, 84 out of 100) had claimed to have received formal training in hand washing.

The overall knowledge of the respondents of Medical Students had 66.5 and Nursing Students had 70.6. Nursing students had significantly better knowledge than medical students. The percentages of correct responses of the two groups of students to the individual questions on hand hygiene knowledge are given in **Table 1**.

Table1: Comparison of knowledge in medical and nursing students on each question

S.No.	Questions	Medical Students (n = 50)	Nursing Student (n = 50)	p-value
1.	Cold water should be used for hand washing	16 (32.0)	30 (60.0)	0.005
2.	Hot water should be used for hand washing	42 (84.0)	34 (68.0)	0.061
3.	There is no need to remove watches and bracelets when washing hands	11 (22.0)	18 (36.0)	0.123

4.	There is no need to remove rings when washing hands	15 (30.0)	14 (28.0)	0.826
5.	There is no need to wash wrists	09 (18.0)	14 (28.0)	0.235
6.	Hands need to be washed for at least 15 Second	35 (70.0)	36 (72.0)	0.826
7.	Hands need to be dried after washing	47 (94.0)	46 (92.0)	0.695
8.	Good hand hygiene practices prevent an individual from getting an infection	44 (88.0)	49 (98.0)	0.050
9.	Hand washing is part of personal hygiene	47 (94.0)	48 (96.0)	0.646
10.	An alcohol-based hand rub is not an appropriate hand-cleaning agent when hands are visibly soiled	37 (74.0)	38 (76.0)	0.817
11.	Skin surfaces that are contaminated with a patient`s blood or body substances must be cleaned as soon as possible	49 (98.0)	44 (88.0)	0.050
12.	Paper towels or single-use cloth towels should be used to dry hands in patient care areas	43 (86.0)	43 (86.0)	1.000
13.	Health creams should be used to prevent chapping and dermatitis on the hands of health care workers	46 (92.0)	41 (82.0)	0.137
14.	Health care workers with weeping skin lesions should not perform direct patient care until the skin lesion resolves	46 (92.0)	44 (88.0)	0.505
15.	Ring and false fingernails can be worn when carrying out patient care	23 (46.0)	30 (60.0)	0.161
16.	10-15 seconds in duration and does not require the use of an antimicrobial solution	22 (44.0)	36 (72.0)	0.008

Z test. $P < 0.05$ (significant), $P < 0.001$ (highly significant), and NS (not significant)

The majority of students had good attitudes to hand hygiene. Nursing students had significantly better attitudes (91.1%) compared to medical students (82.57%). The percentages of correct responses of the two groups of students to the individual questions on hand hygiene attitude are given in **Table 2.**

Table 2: Comparison of hand hygiene practice among medical and nursing students

S.No.	Questions	Medical Students (n = 50)	Nursing Student (n = 50)	p-value
1.	I follow the steps of hand washing	48 (96.0)	49 (98.0)	0.558
2.	I wash my hand before touching the patient	40 (80.0)	47 (94.0)	0.037

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3.	I wash my hand before performing the aseptic and clean procedure	46 (92.0)	49 (98.0)	0.169
4.	I wash my hand after being at risk of exposure	49 (98.0)	49 (98.0)	1.000
5.	I wash my hand after touching a patient	46 (92.0)	47 (94.0)	0.432
6.	I wash my hand after touching patient surroundings	43 (86.0)	49 (98.0)	0.056
7.	I adhere to correct hand hygiene practices at all times	42 (84.0)	46 (92.0)	0.218
8.	I have sufficient knowledge about hand hygiene	43 (86.0)	49 (98.0)	0.056
9.	Sometimes I have more important things to do than hand hygiene	29 (58.0)	42 (84.0)	0.012
10.	Emergencies and other priorities make hygiene more difficult at times	43 (86.0)	46 (92.0)	0.259
11.	Wearing gloves reduces the need for hand hygiene	37 (74.0)	42 (84.0)	0.302
12.	Newly qualified staff has not been properly instructed in hand hygiene in their training	34 (68.0)	33 (66.0)	0.580
13.	I feel guilty if I omit hand hygiene	42 (84.0)	43 (86.0)	0.587
14.	Adhering to hand hygiene practices is easy in the current setup	36 (72.0)	47 (94.0)	0.009

Nursing students had significantly better practices (78.6%) compared to medical students (73.2%) and the difference was statistically significant ($P < 0.05$). The percentages of correct responses of the two groups of students to the individual questions on hand hygiene practice are given in **Table 3.**

Table 3: Comparison of the hand hygiene practices of medical and nursing students

S.No.	Questions	Medical Students (n = 50)	Nursing Student (n = 50)	p-value
1.	I feel regular hand hygiene is important and improves my health	47 (94.0)	45 (90.0)	0.337
2.	Regular hand hygiene practice is inconvenient	26 (52.0)	25 (50.0)	0.220
3.	The recommendation is a regarding hand hygiene are based on sound scientific evidence	40 (80.0)	43 (86.0)	0.698
4.	I prefer to wash my hands with soap rather than use alcohol-based hand sanitizer	37 (74.0)	40 (80.0)	0.064

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5.	I am more likely to carry an alcohol-based hand sanitizer because covid- 19	43 (86.0)	44 (88.0)	0.900
6.	I did not regularly purchase alcohol-based hand sanitizer before the covid 19 pandemic	40 (80.0)	39 (78.0)	0.925
7.	I wash my hand before meals	45 (90.0)	45 (90.0)	0.819
8.	I wash my hand after meals	43 (86.0)	46 (92.0)	0.616
9.	I wash my hand when I come home	42 (84.0)	46 (92.0)	0.346
10.	I wash my hand after handshaking	21 (42.0)	29 (58.0)	0.081
11.	I wash my hand after removing my mask	32 (64.0)	34 (68.0)	0.333
12.	I wash my hand after sneezing	31 (62.0)	37 (74.0)	0.411
13.	I wash my hand after coughing	29 (58.0)	38 (76.0)	0.155

Z test. $P < 0.05$ (significant), $P < 0.001$ (highly significant), and NS (not significant)

DISCUSSION

This study evaluated the knowledge, attitude, and practice (KAP) regarding hand hygiene among undergraduate medical and nursing students. Our findings indicate that nursing students had significantly better knowledge (70.6%) compared to medical students (66.5%), aligning with findings by Maheshwari et al[10], who reported higher knowledge scores among nursing students (68%) than medical students (61%) in a tertiary care institute in Uttar Pradesh. The higher scores among nursing students may be attributed to their structured training in hygiene and more frequent patient interaction during clinical postings.

In terms of attitude, 91.1% of nursing students and 82.57% of medical students showed a positive attitude toward hand hygiene. This is consistent with a study by Ravella et al[11] conducted in Delhi, which found that 89% of nursing students had a positive attitude compared to 76% of medical students. Nursing students were more likely to perceive hand hygiene as essential, even in emergency situations, suggesting a stronger behavioural reinforcement of infection control practices in their curriculum.

Regarding hand hygiene practices, 78.6% of nursing students demonstrated good practices versus 73.2% of medical students, a statistically significant difference. These results are similar to those reported by Vaishnav et al[12] in Maharashtra, where nursing students had significantly better compliance with hand hygiene steps and the "5 Moments for Hand Hygiene" outlined by the World Health Organization (WHO).

The findings reflect a consistent trend across studies—nursing students not only acquire better knowledge but also translate it more effectively into practice.

CONCLUSION & RECOMMENDATION

This study highlights that while most medical and nursing students have received formal training and possess positive attitudes towards hand hygiene, nursing students tend to have significantly better knowledge and practices. This indicates the need for strengthened training modules, especially for medical

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students, to bridge the gap between awareness and consistent implementation.

STRENGTHS

It is a direct comparison between medical and nursing students, providing valuable insights into discipline-specific differences in knowledge, attitude, and practice (KAP) regarding hand hygiene. The use of a questionnaire based on World Health Organization (WHO) guidelines ensures that the assessment tool is both valid and reliable. Additionally, the balanced sample of 50 medical and 50 nursing students allows for fair and unbiased comparisons. The study also addresses a critical aspect of healthcare and hand hygiene which is essential for infection prevention and patient safety. Furthermore, the application of appropriate statistical methods, including the Z-test and interpretation of p-values, adds rigor and credibility to the findings.

LIMITATIONS

It was conducted at a single tertiary care institution—Bundelkhand Medical College—which limits the generalizability of the results to other regions or educational settings. The relatively small sample size of 100 participants may not adequately capture the full spectrum of hand hygiene practices among all healthcare students. Another limitation is the reliance on self-reported data, which is susceptible to social desirability bias, potentially leading participants to report ideal behaviours rather than their actual practices. Moreover, the cross-sectional nature of the study provides only a snapshot of KAP at one point in time and does not account for changes over time or after targeted interventions. Finally, the absence of observational verification of actual hand hygiene behaviour limits the ability to confirm the accuracy of reported practices.

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CONFLICTS OF INTEREST

There are no conflicts of interest

REFERENCES

1. Nair SS, Hanumantappa R, Hiremath SG, Siraj MA, Raghunath P. Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India. *ISRN Prev Med*. 2014;2014:608927. doi:10.1155/2014/608927

2. Thakker VS, Jadhav PR. Knowledge of hand hygiene in undergraduate medical, dental, and nursing students: A cross-sectional survey. *J Fam Med Prim Care*. 2015;4(4):582-586. doi:10.4103/2249-4863.174298

3. Dutta G, Singh TG, Kumar T. Knowledge and practice of hand hygiene among undergraduate students and junior doctors in the Regional Institute of Medical Sciences, Imphal. *J Fam Med Prim Care*. 2020;9(9):4741-4746. doi:10.4103/jfmpc.jfmpc_794_20

4. Dalui A, Banerjee S, Roy R. Assessment of knowledge, attitude, and practice about biomedical waste management among healthcare workers during COVID-19 pandemic in a health district of West Bengal. *Indian J Public Health*. 2021;65(4):345-351. doi:10.4103/ijph.ijph_2103_21

5. Songara P, Saxena G. Knowledge, Attitude, and Practice of Hand Hygiene among Medical students and Nurses at a Tertiary Health Care Centre in Ratlam, Madhya Pradesh. *Trop J Pathol Microbiol*.

2021;7(5):248-253. doi:10.17511/jopm.2021.i05.06

6. Pieters MM, Fahsen N, Quezada R, et al. Assessing hand hygiene knowledge, attitudes, and behaviors among Guatemalan primary school students in the context of the COVID-19 pandemic. *BMC Public Health*. 2023;23(1):2252. doi:10.1186/s12889-023-17168-4

7. WHO guidelines on hand hygiene in health care. Accessed May 18, 2025. https://www.who.int/publications/i/item/9789241597906

8. Constantinou D, Leontiou I, Mpouzika M, Michail K, Middletton N, Merkouris A. Health care workers' knowledge and perceptions on WHO hand hygiene guidelines, and the perceived barriers to compliance with hand hygiene in Cyprus. *BMC Nurs*. 2024;23(1):644. doi:10.1186/s12912-024-02181-8

9. Modi PD, Kumar P, Solanki R, Modi J, Chandramani S, Gill N. Hand Hygiene Practices Among Indian Medical Undergraduates: A Questionnaire-Based Survey. *Cureus*. 2017;9(7):e1463. doi:10.7759/cureus.1463

10. Maheshwari V, Kaore NCM, Ramnani VK, Gupta SK, Borle A, Kaushal R. A Study to Assess Knowledge and Attitude Regarding Hand Hygiene amongst Residents and Nursing Staff in a Tertiary Health Care Setting of Bhopal City. *J Clin Diagn Res JCDR*. 2014;8(8):DC04-07. doi:10.7860/JCDR/2014/8510.4696

11. Ravella Venkatasubramanyam N, Vadivel Kalyanasundaram A, Prabhakaran N. Assessment of Knowledge, Attitude, and Practice of Hand Hygiene Among Medical Students in a Tertiary Care Hospital. *Cureus*. 16(8):e66820. doi:10.7759/cureus.66820

12. Vaishnav B, Bamanikar A, Dasgupta S, Reddy A. Aseptic-clinical hand hygiene knowledge survey amongst health care workers in a tertiary care hospital in Western India. *Int J Res Med Sci*. 2016;4(9):4176-4182. doi:10.18203/2320-6012.ijrms20162956