

Knowledge, Attitudes and Practices of Hand Hygiene amongst Healthcare personnel of Mayo Hospital, Lahore

FATIMA TU ZAHARA¹, ABEERA ISHAQ BUTT², FATIMA ARSHAD³, IQRA KABIR⁴, MUHAMMAD ZEESHAN SARWAR⁵, KHADIJA WAHEED⁶, SYED ASGHAR NAQI⁷

¹SR General Surgery, East Surgery Ward, KEMU/Mayo Hospital, Lahore.

²PGR General Surgery, East Surgery Ward, KEMU/Mayo Hospital, Lahore.

³4th year student, B.Sc. Surgical Technology, KEMU, Lahore.

⁴4th year student, B.Sc. Surgical Technology, KEMU, Lahore.

⁵Associate Professor General Surgery, East Surgery Ward, KEMU/Mayo Hospital, Lahore.

⁶Associate Professor Obgyn, KEMU/Lady Aitchison Hospital, Lahore.

⁷Chairman Department of General Surgery, Professor of East Surgery Ward, KEMU/Mayo Hospital, Lahore.

Corresponding author: Dr. Fatima tu Zahara, Email: fatimazahra2101@yahoo.com, Cell: +92 333 4401503

ABSTRACT

Objective: To verify the knowledge, Attitude and Practices of hand hygiene amongst healthcare personnel of Mayo Hospital, Lahore.

Study Design: A Cross-sectional study was carried among healthcare staff.

Study Duration: September 2018-January 2019.

Results: Overall, 600 doctors and nurses were enrolled in our study, 300 in each group. The mean knowledge score of doctors was 16.1 ± 2.25 while that of nurses was 13.0 ± 2.82 . 13.6% of the doctors found to possess good attitude regarding hand hygiene but 29.6% of them had good practices. On the contrary, only 0.3% of the nurses had good attitude with 22.3% of them had good hand hygiene practices.

Conclusion: Hand hygiene is one of the most effectual and simplest mean to avoid hospital acquired infections. Education of undergraduates is the basis of its implementation, in addition to the availability of the facilities.

Keywords: Knowledge, Attitude, Practices, Hand hygiene.

INTRODUCTION

Healthcare related infections are the unfavorable events that arise in healthcare services worldwide, even if extensively avoidable.⁽¹⁾ Practicing hand hygiene is found to be the easiest, cost-efficient and efficacious technique that can lower the prevalence of health care related infections.⁽²⁾ Despite of this fact, on average healthcare providers clean their hands <50% of the times that they should, majority of them are training students, interns and postgraduates who spend an ample amount of time in clinical settings.⁽²⁾ They also act as a source of transmission of resistant microbes.⁽²⁾

Healthcare related infections due to terrible hand hygiene has been correlated with an unacceptably increased levels of morbidity, mortality and healthcare fees worldwide.⁽³⁾ Of each one 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will catch at least one health care-related infection.⁽⁴⁾ The World Health Organization (WHO) has released the primary Global Patient Safety Challenge "Clean Care is Safer Care" in 2005 and brought the 'five moments of hand hygiene' as guidelines in 2009 in an attempt to lessen the load of health care related infections.⁽⁵⁻⁷⁾

Regrettably, compliance with those hand hygiene suggestions provided by the WHO is usually poor amongst HCPs, and the hand hygiene equipment is not as much as the standards.⁽⁸⁾ Notable elements for poor compliance encompass hand irritation, inaccessibility or scarcity of hand-washing device, inflated work load, and substandard knowledge.⁽⁸⁻¹⁰⁾ A startling disclosure was that compliance was identified to be the lowest before high-risk procedures.⁽¹⁾

In Asia, the prevalence of health-care related infections is found to be far up.⁽¹¹⁾ A study conducted in a Tertiary Health Care Hospital in Raichur, India which showed that more than 91% of the training medical students had claimed to acquire training in hand hygiene techniques but only 19.6% had good compliance with aseptic methods. Work overload and lack of equipment have been the principle issues which have been identified.⁽¹²⁾ A study conducted in Saudi Arabia showed only 17% compliance with hand hygiene amongst medical students compared to the extent of awareness 56% among the same group of students.⁽¹¹⁾

A survey carried out in Pakistan in 2017 showed that better share of female than male health care professionals were contented with their knowledge regarding hygiene i.e., 54.5% as in

comparison to 39.3% while a higher proportion of females i.e., 21.2% than males i.e., 13.3% replied that either they did not know or have never heard about the right technique needed for hand washing suggested by the WHO.⁽⁸⁾

Among healthcare professionals, training medical and nursing students spend most of their time with patients and can potentially transmit infections, if not trained properly. Especially in a resource limited country like Pakistan where we greatly rely on the hand hygiene techniques taught to the students as a part of their clinical skills training as a mean of preventing infection. Gaining proper knowledge, changing attitudes and substandard practices and realizing the significance of hand hygiene in lowering HAI, is quite necessary among health care professionals. We performed this study to assess these parameters in order to upgrade the current training programs and inculcate good practices and work ethics in the future.

METHODS

This cross-sectional survey was carried from September 2018 to January 2019 in Mayo hospital Lahore/King Edward Medical University. Self-administered questionnaire was distributed to 758 health personnel including doctor and nurses. Two reminders were given with 2 weeks interval. Six hundred participants (79.2%) were enrolled in this study and filled the pre-validated questionnaire. The study population was divided into two equal groups, i.e: doctors (300) and nurses (300). Questionnaire consisted of four parts: demographic information, assessment of knowledge, practices and attitudes regarding hand hygiene. Two investigators visited different wards and explained the participants in regard to the nature and the purpose of this study and informed consent was taken on enrollment. Ethical approval was obtained from institutional review board (IRB) of King Edward Medical University, Lahore.

Knowledge was evaluated by the WHO hand hygiene questionnaire consisting of 25 questions with "Yes" or "No" options. Attitudes and practices have been evaluated by an additional self-designed questionnaire consisting of 10 & 6 questions respectively, with options from 1 to 5-point scale between strongly agree to strongly disagree. Options of 'Strongly agree' and 'agree' had been labelled as 'Yes response' and options of 'Neutral', 'Disagree' and 'Strongly Disagree' had been labelled as 'No response'. A scoring method was devised where 1 score was

disposed for every right response about accurate knowledge, right attitude & correct practices. The average score for every category (knowledge, Attitude & Practices) had been used to compute the percentage. A score of greater than 75% labelled as good, 50-75% as moderate and <50 as poor. This questionnaire was sent to a panel of five experts for relevance and content validation. Following an expert validation, pilot survey was conducted. The Cronbach's alpha reliability coefficient for the questionnaire was 0.81. The data was processed and analyzed using spss v 25. Qualitative variables had been evaluated with absolute(n) and relative (%) frequencies whilst quantitative variables had been analyzed through descriptive statistics, using mean±standard deviation. The chi square test have been used to assess for the statistically significant differences amongst the two study populations. The p value of<0.05 was considered statistically significant.

RESULTS

Total 600 participants were enrolled to participate in this study, out of which 300 were doctors and 300 nurses. Among doctors, there were 155 undergraduate medical students and 145 post graduate students. While in nurses, 180 were nursing students and 120 were graduate nurses. The mean age was 24.1±4.02years. Majority of the respondents (469, 78.2%) were females. Of the entire study population, only 34.5% have acquired proper training in hand hygiene. A significant difference was observed amongst doctors and nurses who had acquired proper training in hand washing. (n=92 vs n=63, 30.6% vs 20.7%)

Table 1: Comparison of knowledge among doctors and nurses on each correct response

| Questions | Doctors n=300 | Nurses n=300 | P value |
|---|---------------|--------------|---------|
| Which of the following is the main route of transmission of potentially harmful germs between patients | 168 (56%) | 120 (40%) | 0.000 |
| Which of the following is the most frequent source of germs responsible for health-care associated infections | 67 (22.3%) | 150 (50%) | 0.000 |
| Hand hygiene practices at following points will prevents transmission of germs to patients? | 277 (92.3%) | 240 (80%) | 0.000 |
| Before touching a patient | 277 (92.3%) | 180 (60%) | 0.000 |
| Immediately after risk of body fluid exposure | 71 (23.7%) | 120 (40%) | 0.000 |
| After exposure to immediate surroundings of a patient | 260 (86.7%) | 270 (90%) | 0.204 |
| Immediately before a clean/aseptic procedure | | | |
| Hand hygiene practices at following points will prevents transmission of germs to health care workers? | 273 (91%) | 270 (90%) | 0.677 |
| After touching a patient | 275 (91.7%) | 240 (80%) | 0.000 |
| Immediately after a risk of body fluid exposure | 85 (28.3%) | 90 (30%) | 0.923 |
| Immediately before a clean/aseptic procedure | 245 (81.7%) | 240 (80%) | 0.605 |
| After exposure to immediate surroundings of a patient | | | |
| Which of the following statement on alcohol-based hand rub and hand washing with soap and water is true? | 208 (69.3%) | 90 (30%) | 0.000 |
| Hand rubbing is more rapid for cleansing than hand washing | 183 (61%) | 210 (70%) | 0.013 |
| Hand rubbing causes skin dryness more than hand washing | 135 (45%) | 240 (80%) | 0.000 |
| Hand rubbing is more effective against germs than hand washing | 96 (32%) | 240 (80%) | 0.001 |
| Hand washing and hand rubbing are recommended to be performed in sequence | 199 (66.3%) | 210 (70%) | 0.336 |
| Is 20 sec sufficient time for alcohol-based hand rub to kill germs on hands? | | | |
| Which type of hand hygiene method is required in the following situations? | 220 (73.3%) | 60 (20%) | 0.000 |
| Before palpation of the abdomen | 177 (59%) | 60 (20%) | 0.000 |
| Before giving an injection | 221 (73.7%) | 240 (80%) | 0.066 |
| After emptying a bed pan | 297 (99%) | 270 (90%) | 0.000 |
| After removing examination gloves | 121 (40.3%) | 30 (10%) | 0.000 |
| After making a patient's bed | 211 (70.3%) | 180 (60%) | 0.008 |
| After visible exposure to blood | 233 (77.7%) | 240 (80%) | 0.485 |
| Wearing jewelry | 283 (94.3%) | 240 (80%) | 0.000 |
| Damaged skin | 268 (89.3%) | 270 (90%) | 0.789 |
| Artificial fingernails | 208 (69.3%) | 210 (70%) | 0.000 |
| Regular use of hand cream | | | |

Knowledge about hand hygiene: The knowledge scores of doctors ranged from 10/25 to 21/25 and the mean score was 16.1±2.25. While the nurses' knowledge score stretched from 7/25 to 17/25 with the mean score of 13.0±2.82. Surprisingly, only 13.3% of the doctors had good knowledge about hand hygiene. However, not a single participant from nurses group demonstrated good knowledge on hand hygiene. A total of 79.3% of the doctors and 71% of the nurses had moderate knowledge while 7.4% of the doctors and 29% of the nurses had poor knowledge about hand hygiene. (Table 1)

Attitude on hand hygiene: When assessed for attitudes, only 13.6% of the doctors and 0.3% of the nurses had demonstrated good attitude towards hand hygiene. Majority of the nurses (81%) and doctors (39.6%) had displayed moderate attitudes towards hand hygiene. When compared to the doctors,90% of the nurses have claimed to practice the accurate hand hygiene practices all the time (p value<0.05). Moreover, 25% of the doctors accepted that emergency situations and other responsibilities make hand hygiene difficult. Interestingly, 100% of the nurses feel responsible if they miss hand hygiene as compared to 70.3% of doctors (p value<0.05). A total of 90% of the nurses found out that practicing hand hygiene is easy in current setup (p value<0.05). (Table 2)

Practices of hand hygiene: Concerning hand hygiene practices, only 22.3% nurses had good hand hygiene practices while 29.6% of doctors had good practices. A total of 52.3% of the doctors and 70.3% of the nurses had moderate hand hygiene practices. All the nurses correctly responded about the positive influence of infection control team and infection control posters & pamphlets (p value<0.05). A total of 36.3% of the doctors and 40% of the nurses found it difficult to attend hand hygiene course (p value=0.356). (Table 3).

Table 2: Comparison of attitude between doctors and nurses on each correct response

| Questions | Doctors n=300 | Nurses n=300 | P value |
|--|---------------|--------------|---------|
| I stick to correct hand hygiene practices all the time | 206 (68.7%) | 270 (90%) | 0.000 |
| I have sufficient knowledge about hand hygiene | 198 (66%) | 210 (70%) | 0.294 |
| Sometimes I have more important things to do than hand hygiene | 183 (61%) | 60 (20%) | 0.000 |
| Emergencies and other priorities make hygiene more difficult at times | 75 (25%) | 120 (40%) | 0.000 |
| Wearing gloves reduces the need of hand hygiene | 130 (43.3%) | 210 (70%) | 0.000 |
| I feel frustrated when others omit hand hygiene | 181 (60.3%) | 180 (60%) | 0.934 |
| I am reluctant to ask others to engage in hand hygiene | 211 (70.3%) | 150 (50%) | 0.000 |
| Newly qualified staff has not been properly instructed in hand hygiene in their training | 198 (66%) | 270 (90%) | 0.000 |
| I feel guilty if I omit hand hygiene | 211 (70.3%) | 300 (100%) | 0.000 |
| Practicing hand hygiene technique is easy in current setup | 147 (49%) | 270 (90%) | 0.000 |

Table 3: Comparison of practice between doctors and nurses on each correct response

| Questions | Doctors n=300 | Nurses n=300 | P value |
|--|---------------|--------------|---------|
| Sometimes I miss out hand hygiene because I forget it | 130 (43.3%) | 90 (30%) | 0.001 |
| Hand hygiene is an essential part of my role | 244 (81.3%) | 270 (90%) | 0.002 |
| Frequency of hand hygiene required makes it difficult for me to carry it out as often as necessary | 93 (31.0%) | 90 (30%) | 0.791 |
| Infection prevention team would have a positive influence on my hand | 222 (74%) | 300 (100%) | 0.000 |
| Infection prevention posters, pamphlets, notice boards remind me to do hand hygiene | 226 (75.3%) | 300 (100%) | 0.000 |
| It is difficult for me to attend hand hygiene courses due to time pressure | 109 (36.3%) | 120 (40%) | 0.356 |

DISCUSSION

Hand hygiene is considered as the distinctive component of infection prevention strategies.⁽¹³⁾ The compliance with hand hygiene practices has resulted in significant reduction in spread of hospital acquired infection eventually reducing patient's morbidity,

length of hospital stay, health care cost and use of resources.^(13,14) In spite of the fact that hand hygiene is a basic methodology and has for some time been considered perhaps the main contamination control gauges, the consistence rates by healthcare workers are by and large answered to be low.⁽¹⁵⁾

The results of our study revealed that knowledge regarding hand hygiene was identified to be appreciably better amongst doctors as compared with nurses and it was statistically significant (p value=0.001). Greater number of doctors and nurses (79.3% and 70% respectively) had moderate knowledge about hand hygiene which is a good indicator. Our findings contrast well with the findings in studies conducted in India and Iran that recorded 80.9% and 68% prevalence of moderate knowledge towards hand hygiene respectively.^(16,17) A study conducted in Nigeria stated that 91.7% of the respondents had good knowledge about hand hygiene.⁽¹⁸⁾ When knowledge about hand washing using soap & water and hand rubbing using alcohol-based hand solution was tested, it was revealed that 69.3% of doctors and only 30% of nurses agreed that hand rubbing gives better outcomes as compared to conventional hand washing (p=0.000). Interestingly, only 70% of the doctors and 66.3% of the nurses were aware of the fact that 20 sec hand rubbing with alcohol-based solution is required to kill germs. A study conducted in India stated that 61.3% of the participants accepted that hand rubbing is better as compared with conventional hand washing while only 36.1% of the health workers responded correctly to statement that "Is 20 sec sufficient time for alcohol-based hand rub to remove germs from hands?"⁽¹⁶⁾

Centers for Disease Control and Prevention (CDC) recommended that alcohol-based solutions need to be preferred for hand antisepsis in all clinical situations e.g. before & after touching the patient, after exposure with body fluids and secretions, right after removing gloves.⁽⁷⁾ However, when asked about hand hygiene techniques needed in given circumstances, health care workers concurred that hand rubbing is required before touching the patient (92.3% of the doctors and 80% of the nurses), immediately after body fluid exposure (92.3% doctors and 60% nurses), after removing examination gloves (99% of the doctors and 90% of the nurses). A study carried out in Nigeria showed that participants agreed that hand rubbing is required right before touching a patient and after contact with body secretions (89.6% & 90% respectively).⁽¹⁸⁾

In current study, nurses demonstrated better attitudes towards hand hygiene practices as compared to the doctors. 90% of the nurses and 68.7% of the doctors stick to HH practices all the time. Further, doctors are more reluctant to ask others to engage in hand hygiene activities as compared to the nurses (p value=0.000). 90% of the nurses and 66% of the doctors responded positively to the question that "Newly certified staff has not been properly instructed in hand hygiene during their training". This highlights the significance of institution based training programs for undergraduate students and newly qualified staff as CDC (Centers for Disease Control and Prevention) and WHO have also emphasized on training programs for healthcare workers, monitoring of HH practices and providing feedback.⁽⁷⁾ In our study, majority of the study participants conceded the positive impact of hospital prevention team on their hand hygiene practices. (74% of the doctors and 100% of the nurses p value=0.000). However, a study conducted in Srilanka showed that only 32.5% of the participants agreed to the positive impact of hospital prevention team on hand hygiene practices.⁽¹⁹⁾ Another comforting prospect is that 81.3% of the doctors and 90% of the nurses comprehend that hand hygiene is a fundamental part of their role.

As suggested by previous studies, hand hygiene practices of healthcare workers are influenced by peer hand hygiene compliance, role model, availability of resources, high workload and time constraints.^(20,21) 61% of the doctors revealed that they skip hand hygiene due to other important work activity. Therefore, we believe that in government hospital patient: doctor ratio and patients: nurse ratio is an important contributing factor in low

compliance concerning hand hygiene practices. 905 of the nurses and 49% of the doctors revealed that hand hygiene can easily be practiced in current setup. This highlights the non-availability of resources to maintain hand hygiene. In an earlier study conducted in India, nursing students demonstrated better attitudes as compared to medical students.⁽¹¹⁾

Our study has few limitations. This was a cross sectional survey based on self-administered questionnaire. So, we were unable to directly observe the hand hygiene practices of healthcare workers. Moreover, the study population was selected from one institution and the results of this study might not symbolize the KAPs of healthcare workers in the entire country.

CONCLUSION

Hand hygiene is a foremost practice in healthcare. Hence, in order to limit the transmission of infection, we should design our education system to conduct regular hand hygiene sessions for all the undergraduate students as they will be contributing in hand hygiene in future. Healthcare administrators should ensure the availability of hand wash areas, continuous supply of water and alcohol-based hand rub. Some performance pointers to test the health workers compliance & development in HH must be designed. The markers incorporate regularly checking the volume of hand hygiene events conducted by the health workers, measuring the amount of alcohol-based hand rub being utilized, observing the consistence of not utilizing artificial fingernails and jewelry that may additionally give area to colonization of germs.

REFERENCES

- Zottele C, Magnago TSBdS, Dullius AldS, Kolankiewicz ACB, Ongaro JD. Hand hygiene compliance of healthcare professionals in an emergency department. *Revista da Escola de Enfermagem da USP.* 2017;51.
- Al Kadi A, Salati SA. Hand hygiene practices among medical students. *Interdisciplinary perspectives on infectious diseases.* 2012;2012.
- Nabavi M, Alavi-Moghaddam M, Gachkar L, Moeinian M. Knowledge, attitudes, and practices study on hand hygiene among Imam Hossein Hospital's residents in 2013. *Iranian Red Crescent Medical Journal.* 2015;17(10).
- Available from: http://whqlibdoc.who.int/hq/2005/WHO_EIP_SPO_QPS_05.2.pdf.
- Chou D, Achan P, Ramachandran M. The World Health Organization '5 Moments of Hand Hygiene' The scientific foundation. *The Journal of bone and joint surgery British volume.* 2012;94(4):441-5.
- Longtin Y, Sax H, Allegranzi B, Schneider F, Pittet D. Hand hygiene. *N Engl J Med.* 2011;364(13):e24.
- Pittet D, Allegranzi B, Boyce J, Experts WHOWAfPSFGPSCCGo. The World Health Organization guidelines on hand hygiene in health care and their consensus recommendations. *Infection Control & Hospital Epidemiology.* 2009;30(7):611-22.
- Zil-E-Ali A, Cheema MA, Ullah MW, Ghulam H, Tariq M. A survey of handwashing knowledge and attitudes among the healthcare professionals in Lahore, Pakistan. *Cureus.* 2017;9(3).
- Anwar MA, Rabbi S, Masroor M, Majeed F, Andrades M, Baqi S. Self-reported practices of hand hygiene among the trainees of a teaching hospital in a resource limited country. *JPMA The Journal of the Pakistan Medical Association.* 2009;59(9):631.
- Akyol AD. Hand hygiene among nurses in Turkey: opinions and practices. *Journal of clinical nursing.* 2007;16(3):431-7.
- 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. *International Scholarly Research Notices.* 2014;2014.
- Ariyaratne M, Gunasekara T, Weerasekara M, Kottahachchi J, Kudavidanage B, Fernando S. Knowledge, attitudes and practices of hand hygiene among final year medical and nursing students at the University of Sri Jayewardenepura. 2015.
- Jumaa P. Hand hygiene: simple and complex. *International Journal of Infectious Diseases.* 2005;9(1):3-14.
- Hugonnet S, Pittet D. Hand hygiene—beliefs or science? *Clinical microbiology and infection.* 2000;6(7):348-54.
- Ahmed J, Malik F, Memon ZA, Arif TB, Ali A, Nasim S, et al. Compliance and knowledge of healthcare workers regarding hand

- hygiene and use of disinfectants: a study based in Karachi. *Cureus*. 2020;12(2).
16. 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).
 17. Zakeri H, Ahmadi F, Rafeemanesh E, Saleh LA. The knowledge of hand hygiene among the healthcare workers of two teaching hospitals in Mashhad. *Electronic physician*. 2017;9(8):5159.
 18. Ango UM, Awosan KJ, Adamu H, Salawu S, Sani MM, Ibrahim A. Knowledge, attitude and practice of hand hygiene among healthcare providers in semi-urban communities of Sokoto State, Nigeria. *Int J Trop Dis Health*. 2017;26(2):1-9.
 19. Kudavidhange B, Gunasekara T, Hapuarachchi S. Knowledge, attitudes and practices on hand hygiene among ICU staff in Anuradhapura Teaching hospital. 2015.
 20. Lankford MG, Zembower TR, Trick WE, Hacek DM, Noskin GA, Peterson LR. Influence of role models and hospital design on the hand hygiene of health-care workers. *Emerging infectious diseases*. 2003;9(2):217.
 21. Pyne E, Sater L, McAvoy T. Physician attitudes toward hand hygiene in the acute care setting. *Wisconsin Medical Society Fellowship*. 2010.