ORIGINAL ARTICLE

Assessment of knowledge regarding hand hygiene among healthcare workers at a cantonment-based public sector hospital in Pakistan

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ABSTRACT

Background and Objective: Hand hygiene is regarded as one of the most important strategies in limiting infections and hospital-acquired diseases in healthcare settings. Adopting an optimal and scientifically validated technique of maintaining hand hygiene in healthcare centers is considered the safest and cost-effective method to prevent infection transmission to and from the patients. The present study was planned to determine the knowledge of healthcare workers about hand hygiene using the standard questionnaire in a local tertiary care hospital.

Methods: It was a cross-sectional survey conducted at the Pakistan Ordnance Factories Hospital, Wah Cantonment, Pakistan, for 3 months. By adopting purposive sampling, a total of 165 healthcare professionals were recruited for the study. "Hand Hygiene Knowledge Questionnaire for Healthcare Workers," published by World Health Organization (WHO), was used for data collection. Each subject filled out the questionnaire by himself/herself. Data were entered and analyzed in Statistical Package for the Social Sciences version 22.0.

Result: It was observed that only 11 (6.6%) subjects had good knowledge of hand hygiene according to the standard guidelines, while majority of the respondents (58.2%) had a moderate level of knowledge according to the WHO criteria. There was no statistical difference in the scores among medical doctors and nurses.

Conclusion: The level of knowledge about hand hygiene among healthcare workers is unsatisfactory. It calls for effective reinforcement through repeated training and awareness seminars as a part of routine work to inculcate this habit for better infection control in hospital settings.

Keywords: Hand hygiene, knowledge, healthcare workers, infection control, cross infection, World Health Organization.

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Introduction

Transmission of most of the hospital-acquired infections to the patients, through inappropriate hand hygiene practices of healthcare workers around the globe,[1,2] can be prevented by developing standard hand hygiene habits among personnel.[3] Adherence to hand washing protocols is reported to be quite poor among healthcare workers.[4] In Pakistan, there is a need for strengthening infection prevention and control programs, especially in public healthcare facilities.[5] The Centers of Disease Control and Prevention recommends the use of alcohol-based hand rubs (ABHRs) containing 60%-95% alcohol as a standard when hands are not visibly soiled.[6] Along with proper hand washing procedures, effective hand drying significantly removes bacteria and decreases the probability to transmit microorganisms.[7] In an era of increasing antibiotic resistance, establishing a well-maintained hand hygiene routine is essential as it subsides the ailment.[6,8] These infections lead to an increase in morbidity and mortality, affects the prognosis of disease, lengthens the duration of hospitalization, and intensifies workload on hospital staff.[6,9] A positive attitude toward hand hygiene ameliorates quality of care and systematically improves prognosis.[10] As an example, during the coronavirus disease 2019 era, the incidence of hospital-acquired infections has reduced due to adequate hand washing by healthcare professionals.[11] The World Health Organization (WHO) has introduced a questionnaire to assess hand hygiene knowledge among healthcare professionals,[12] and the objective of the study was to determine the knowledge of hand hygiene among

medical doctors and nurses working at the Pakistan Ordnance Factories (POF) Hospital, Wah Cantt, Pakistan, using this tool.

Methods

It was a cross-sectional survey conducted at POF Hospital, Wah Cantonment, Pakistan, a 676 bedded public-sector hospital. The duration of the study was 3 months (April 1, 2022, to July 1, 2022). The sample size of 165 was calculated using the WHO sample size calculator, considering *p*-value = 0.12[13] and α = 0.05. The purposive sampling technique was used to include all the available nurses and medical doctors (healthcare workers) employed at the POF Hospital, Wah Cantt. "Hand Hygiene Knowledge Questionnaire for Healthcare Workers," published by the WHO, was used for data collection.[12] Hard copies of the questionnaire were distributed among healthcare workers available on duty in different departments during the period of data collection, and informed consent was taken. The participants were allowed to fill them out in confidentiality and were collected back at the end of their working hours.

Knowledge about hand hygiene was assessed by scoring the knowledge-related questions and then categorizing the scores as good, moderate, and poor. Each correct option was given a score of 1, and each incorrect option selected was given a score of 0. This made a maximum achievable score of 25 and a minimum of 0. Knowledge score was categorized as good (score ≥80%), moderate (score <80% and ≥60%) and poor (score <60%).

Statistical analysis

Statistical Package for the Social Sciences version 22 was used for data entry and analysis. Descriptive analysis was done, and frequency tables were made accordingly. Knowledge score was calculated and categorized. Chi-squared test was used to assess the distribution and differences in knowledge regarding hand hygiene among medical doctors and nurses. *p*-value ≥ 0.05 was considered statistically significant.

Results

The mean age of the participants in our study was 27.7 (±5.0) years. Out of 165 healthcare workers, majority were female (54.5%). More than 50% of the respondents were doctors. The study subjects belonged to different specialties, with the majority being deputed in the medicine department at the time of study (Table 1).

Some of the important findings were that 147 (89.1%) participants used ABHRs, while hand hygiene workshops were attended by more than two-thirds of the respondents (75.2%) in the last 3 years. Knowledge score was calculated and compared between the nurses and medical doctors. Most of the respondents (58.2%) had moderate knowledge, while only 6.6% respondents had good knowledge according to the WHO criteria. There was no statistical difference in the scores among medical doctors and nurses (*p*-value = 0.828) (Table 2).

Table 1. *Demographic profile of the participants.*

Characteristics	*n* (%)
Gender	
Male	75 (45.5%)
Female	90 (54.5%)
Professional category	
Medical doctor	99 (60%)
Nurses	66 (40%)
Departments	
Medicine	51 (30.9%)
Surgery	30 (18.2%)
Pediatrics	24 (14.5%)
Emergency room	19 (11.5%)
Intensive care unit	18 (10.9%)
Gynec and obstetrics	16 (9.7%)
Otolaryngology	04 (2.4%)
Ophthalmology	02 (1.2%)
Outpatient department	01 (0.6%)

Discussion

Adherence to hand hygiene protocols is an important factor in the prevention of transmission of infections in clinical settings which leads to a reduced economic burden on a country. The present study focused on the evaluation of hand hygiene knowledge among medical doctors and nurses working in a tertiary care healthcare setup.

Out of 165 health professionals, only 11 (6.7%) participants had good knowledge of hand hygiene. This figure was lower than the results of another study done in Pakistan[12] (87.3%) and Northeast Ethiopia[2] (66%). In a study conducted among medical and nursing students in India, the hand hygiene knowledge was good in less than 10%, and two-thirds of the participants had moderate knowledge,[14] which is consistent with the results of our study.

A study was conducted at 9 government and private healthcare setups across all levels in Lahore and Phool Nagar, Pakistan, among 300 healthcare workers. It concluded that there is a gap between hand hygiene practices and knowledge among participants employed in tertiary care setups in Lahore. It reported the mean knowledge score of 160.34 for nurses and 90.89 for doctors,[15] while in our study no statistical difference in knowledge regarding hand hygiene was found among the two professional categories.

The mean age of the participants was 27.7 (±5.0) years, whereas in another study conducted among health professionals in Pakistan, the median age was 28 years which is comparable.[15] This shows that majority of the participants who are directly dealing with the clinical care are younger professionals. Therefore, it becomes imperative to focus on arranging frequent training workshops about hand hygiene

Table 2. *Score among the healthcare professionals as per the WHO hand hygiene knowledge questionnaire.*

Professional category	Knowledge score			Total	*p*-value*
	Poor *n* (%)	Moderate *n* (%)	Good *n* (%)	*n* (%)	
Medical doctors	33 (33.3%)	59 (59.6%)	7 (7.1%)	99 (60%)	0.828
Nurses	25 (37.9%)	37 (56.1%)	4 (6.1%)	66 (40%)	
Total	58 (35.2%)	96 (58.2%)	11 (6.6%)	165 (100%)	

* Chi-square test.

for this younger workforce A study conducted in Thailand for evaluating the effectiveness of interventions for improving the adherence to hand washing practices reported an increase in the handwashing rates among public health students after conducting the intervention of "Germ-Free Hands."[16]

A study was conducted regarding hand washing practices among 187 dentists across Pakistan, which showed that even after hand hygiene training, compliance to hand hygiene was not up to the mark which was attributed to factors like it is a time-consuming activity, lack of understanding about the importance of handwashing in the prevention of disease transmission, and skin irritation.[17] Another study conducted at the Stollery Children's Hospital, Canada, reported that the hospital-wide adherence to hand hygiene was 45%-80% among pediatric residents, which was lower than the resident's expectations.[18] As a part of the quality improvement project, a study was conducted in 60 hospitals of Telangana and Andhra Pradesh, India, where the overall compliance to hand hygiene was found to be 23%.[19]

The specialty distribution of the participants in the present study showed that out of all the 165 subjects, 51 (30.9%) belonged to medicine, 30 (18.2%) belonged to surgery, and 24 (14.5%) to pediatrics, and the rest of the respondents were working at other minor specialty wards. Therefore, we can infer from the study that the prevalence of knowledge about hand hygiene is particularly lacking among doctors and nurses from the major specialties. This is in contrast to another similar research conducted at a tertiary care Military Hospital of Northern Pakistan in 2018 where out of 196 participants, majority of the healthcare workers were from the Departments of Surgery and Intensive care combined (49.5%), while very little representation was from the Departments of Pediatrics (0.5%) and Medicine (5%).[20]

In the present study, 124 (75.2%) out of 165 respondents received formal hand hygiene training. This finding was better than the one reported by a survey study of hand washing knowledge among healthcare professionals in Lahore where upto 51.4% of health professionals were formally trained,[21] while another study in Pakistan showed a higher percentage (81.4%) of healthcare professionals who had received formal hand hygiene training.[15]

The present study reports better compliance of the participants to the use of ABHRs for hand cleaning where out of 165 people, 147 (89.1%) reported using rubs as compared to a similar study conducted in India, where only 71.9% of the people preferred hand rubbing as a method for hand cleaning.[11]

About 78 (47.3%) participants knew that dirty hands are the main cause of transmission of pathogens from health professionals to patients, while another study conducted in Pakistan reported quite a high number of respondents (94.2%) knowing about this aspect of disease transmission.[5] Hand hygiene is an important practice in healthcare settings. Adequate knowledge about this attribute and its practicality among healthcare professionals can directly affect the health and well-being of the patients. This study reports significant gaps in the relevant knowledge by health professionals.

Conclusion

It is concluded that there is a serious lack of knowledge about hand hygiene among healthcare workers, which may directly be a source of cross-infection in the healthcare settings. Hence, there is a dire need to improve hand hygiene conditions and relevant education according to the WHO guidelines for better infection control in local hospitals.

Limitations of the study

The findings of this study were based upon responses collected from healthcare workers employed at a single healthcare facility and a nonrandom sampling technique was used, thus the findings lack generalizability in a national context.

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List of Abbreviations

ABHRs	Alcohol-based hand rubs
POF	Pakistan Ordnance Factories
WHO	World Health Organization

Conflict of interest

None to declare.

Grant support and financial disclosure
None to disclose.

Ethical approval
Ethical approval for the study was obtained from the Institutional Review Board (IRB) of Wah Medical College, Wah Cantt., Pakistan, on 13-05-2022 vide Letter No. WMC/ERC/IRB/27.

Authors' contributions
SA and KWK: Conception and design of the study, drafting and revising the manuscript, and data analysis.
SI: Revised the manuscript critically for important intellectual content.
SN: Data acquisition and drafting of the manuscript.
ALL AUTHORS: Approval of the final version of the manuscript to be published.

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