



Original Article

Assessment of Knowledge of Healthcare Professionals on Hand Hygiene Practices in Tertiary Care Hospitals: A Descriptive Cross-Sectional Study

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ABSTRACT

Hand hygiene is one of the significant strategies to control and reduce infections, mortality, and healthcare cost in healthcare settings. Knowledge about hand hygiene practices helps to adopt optimal and validated techniques to prevent the transmission of infections. Therefore, the study was carried out to assess the healthcare professionals' knowledge of hand hygiene practices in hospital settings. **Objectives:** To assess the knowledge of healthcare professionals regarding hand hygiene practices in hospitals. **Methods:** A descriptive cross-sectional study was carried out on healthcare professionals. After fulfilling the inclusion criteria, a total of 250 participants were selected by using convenient sampling techniques. The WHO questionnaire on Hand Hygiene Knowledge was used to fulfill the aims of the study. Descriptive statistics were utilized to analyze data. **Results:** The results of the current study showed that 59.2% of healthcare professionals had received formal training in hand hygiene in the last past 3 years. Overall moderate knowledge had been observed among healthcare professionals across the different departments. **Conclusions:** Having adequate knowledge related to hand hygiene practice cannot work alone to prevent the cross-transmission of germs. Proper surveillance and observation can increase compliance with hand hygiene. There is a strong demand to initiate different activities and workshops to train healthcare professionals on hand hygiene. As healthcare professionals are in close contact with patients in different departments even intensive care units. So, therefore, they need to be fully equipped with the basic knowledge and practice of HH.

INTRODUCTION

Hand Hygiene is now considered the paramount element involve in controlling healthcare-related infections. In the wake of growing attention to healthcare-associated infections (HAIs), close attention is being paid to basic infection prevention such as hand hygiene and improving healthcare systems [1]. As hand hygiene is cited as the most significant way to prevent the transmission of infections and viruses [2]. The medical community all around the globe is now witnessing unprecedented progression to understand and raise awareness about the pathophysiology of infectious diseases and prevention in healthcare settings. It is understood the fact that strict

compliance of hospital staff to hand hygiene can easily minimize risk factors of cross-transmission of different infections [3, 4]. All around the world, many people die daily due to different infectious diseases through healthcare procedures. One most recent survey report showed the review of data available from 2016 to 2019 on the Hand Hygiene Assessment Framework (HHSFAF). According to their report, in low and middle-income countries, data on hand sanitation is limited but through the available evidence, it is analyzed that these countries are experiencing more healthcare-associated infections (HAIs) and dire economic consequences [5]. This study's

findings emphasized that compliance with hand hygiene can reduce the cross-transmission of infections in healthcare setups. Pakistan as a developing country is facing different daunting challenges in the healthcare sector such as inadequate infection control practices, poor surveillance, and lack of training programs. Different studies in the Pakistani context conducted on the assessment of knowledge and compliance regarding hand hygiene practices among healthcare workers showed reported mixed findings [6, 7]. As 12 % compliance had been reported among healthcare professionals although 62.73% of participants were aware of the WHO hand hygiene guidelines [8]. Adherence of healthcare professionals to hand hygiene-related practices in terms of knowledge and attitude has become a strong key indicator of patients' safety and quality of healthcare services [9]. Unfortunately, compliance with hand hygiene practices is still deficient. Knowledge and attitude are the most prominent determinant of following hand hygiene guidelines in hospital settings. Healthcare professionals are directly or indirectly involved in patient care in hospitals, so their negligence towards hand hygiene can put patient's life at risk of developing different infections. Contrariwise, hand hygiene procedures and guidelines are relatively simple and easy to follow. But still, studies have proved that compliance and adherence to these simple procedures are not favorable among healthcare professionals [10, 11]. Thus, improper hand hygiene results in nearly 50% of deaths in hospital settings [1]. Therefore, the present study aimed to evaluate the knowledge of healthcare professionals regarding hand hygiene practices in tertiary care hospitals.

METHODS

To fulfill the aims of the study, a cross-sectional descriptive study design was selected. The study was conducted in tertiary care hospitals in Rawalpindi. The study duration was from September 2022 to January 2023. A total of 385 study sample was calculated by using the WHO sample size calculator with a 95% Confidence Interval (CI) and a 5 % margin of error. Finally, a total of 250 samples were recruited by using the convenient sampling technique with a 65% response rate). Doctors, nurses, and paramedical staff appointed in wards and intensive care units were included in the study while management staff and those who were on leave were excluded from the study. "Hand Hygiene Knowledge Questionnaire for Health Care Workers" by WHO [12] was utilized to assess hand hygiene practice and knowledge. This 21-item questionnaire has dichotomous (yes and no) and multiple-choice questions to evaluate hand hygiene knowledge. Right answers were rated on a score of "1" while missing or wrong answers were

given a "0" score. The total knowledge score was calculated by adding scores on all items. Hence, the total score was considered according to the mean knowledge score into three categories, scores below 50 % were considered poor, scores of 50-75% displayed moderate knowledge, and those above 75% showed good knowledge [13]. Ethical approval was taken from the institutional review board (Re:326-AAA-ERC-AFPGMI) to conduct this study. Participants were informed about the purpose of the study and assured about the confidentiality and privacy of their data. For data analysis, IBM SPSS version 24.0 was used. To achieve the aims of the study, descriptive statistics were applied to calculate the frequencies and percentages of variables.

RESULTS

The descriptive statistics showed the frequency and percentage across the demographic characteristics of the sample in Table I. It demonstrated that 79(31.6%) were male and 171(68.4) were female. Further, it revealed that 114(45.6) of the participants were nurses, 21(8.4) auxiliary nurses, and 22(8.8) medical professionals (Table 1).

Table 1: Demographics characteristics of Healthcare work

Variables	f (%)
Gender	
Male	79(31.6)
Female	171(68.4)
Department	
Internal medicine	4(1.6)
Surgery	33(13.2)
Intensive care unit	84(33.6)
Mixed medical/surgical	14(5.6)
Emergency unit	3(1.2)
Obstetrics	18(7.2)
Pediatrics	14(5.6)
Long-term/rehabilitation	14(5.6)
Outpatient clinic	26(10.4)
Other (dietician, dentist, social worker, etc.)	40(16.0)
Profession	
Nurse	114(45.6)
Auxiliary nurse	21(8.4)
Midwife	3(1.2)
Medical doctor	22(8.8)
Resident	37(14.8)
Technician	30(12.0)
Therapist	5(2.0)
Nurse student	10(4.0)
Other	8(3.2)

Further, Table 2 contained responses to the WHO hand hygiene knowledge questionnaire are presented. Findings

revealed that a total of 148(59.2) medical professionals confirmed that they received formal training in the past three months. In question-related to the "route of cross-transmission of potentially harmful germs between patients", healthcare workers' hands stood out as the most prominent factor (68%) while "air circulating in hospital" on the second number with 18.8%. on the other hand, in response to hand hygiene action prevention, wash hands before touching the patient 233(93.2). In response to factors that "increase the likelihood of colonization of hands with harmful germs", wearing jewels 226 (90.4), injured or damaged skins 226(90.4), and artificial nails 210(84) are proved as the main transmission gate for germs.

Table 2: Participants' Responses to the WHO Hand Hygiene Questionnaire

Questions	Yes n (%)	No n (%)
Formal Training related to hand hygiene in the last three years.	148(59.2)	102(40.8)
Use of alcohol-based rub for hand hygiene	221(88.4)	29(11.6)
The main route of cross-transmission of harmful germs between patients in the healthcare facility		n (%)
Healthcare workers' hands when not clean		170(68)
Hospital air circulation		47(18.8)
Patients' exposure to colonized surfaces		20(8.0)
Noninvasive objects such as pressure cuffs etc. sharing between patients		13(5.2)
Most frequent sources responsible for healthcare-associated infections		n (%)
Water systems in hospitals		35(14)
Air circulating in hospitals		58(23.2)
Presence of germs already on or within the patients		53(21.2)
Hospital environment		104(41.6)
Main hand hygiene actions to prevent germs transmission to the patients		Yes n (%)
Before touching the patients	233(93.2)	17(6.8)
Straightaway after the risk of body fluid exposure	206(82.4)	44(17.6)
After getting exposed to the immediate surroundings of patients	185(74)	65(26)
Immediately before an aseptic procedure	207(82.8)	43(17.2)
Hand hygiene actions to prevent germs transmission to healthcare workers		
After touching the patients	234(93.6)	15(6)
Immediately after the risk of body fluid exposure	221(88.4)	29(11.6)
Immediately before an aseptic procedure	191(76.4)	59(23.6)
After getting exposed to the immediate surroundings of the patients	187(74.8)	63(25.2)
Which of the statements on alcohol-based hand rub and hand washing with soap are true?		True
Rubbing the hand is more rapid than hand washing	203(81.2)	47(18.8)
Hand rubbing leads to skin dryness than hand washing	182(72.8)	68(27.2)
Hand rubbing is a more effective germ protection system than hand washing	162(64.8)	88(35.2)
Hand rubbing and washing are to be performed in sequence	195(78)	55(22)
Minimal time to perform alcohol-based hand rubbing		n (%)
20 seconds		139(55.6)
3 seconds		11(4.4)
1 minute		30(12)
10 seconds		70(28)
Identify which type of method is required in the following given situations		
Before palpation of the abdomen	Rubbing	120(48)
Before giving injections to patients	Rubbing	99(39.6)
After emptying a bedpan	Washing	152(60.8)
After removing the gloves used in the examination	Washing	142(56.8)

After making a bed for the patients	Washing	144(57.6)
After getting exposure to blood	Washing	135(54)
Methods should be avoided or associated with increased likelihood of colonization of harmful germs through hands.	Yes n (%)	No n (%)
Jewelry	226(90.4)	24(9.6)
Damaged skin	226(90.4)	24(9.6)
Artificial fingernails	210(84)	40(16)
Hand cream regular use	120(48)	130(52)

Table 3 findings showed the comparison in different departments on hand hygiene knowledge among healthcare professionals. The internal medicine, department has moderate knowledge (25%) to hand sanitation, and the emergency department has good knowledge (66.7%) regarding hand hygiene practices. Conversely, the percentage of poor and adequate knowledge of hand hygiene is remarkably high among different departments, while a very little percentage is available which can show they have good knowledge related to hand hygiene as explained in Table 3.

Table 3: Assessment and comparison of Knowledge across hospital departments

Departments	Poor level knowledge n (%)	Moderate level knowledge n (%)	Good level knowledge n (%)	Total
Internal medicine	3 (75.0%)	1 (25.0%)	0 (0.0%)	4
Surgery	3 (9.1%)	29 (87.9%)	1 (3.0%)	33
Intensive care unit	1 (1.2%)	78 (92.9%)	5 (6.0%)	84
Mixed medical/surgical	1 (7.1%)	13 (92.9%)	0 (0.0%)	14
Emergency unit	0 (0.0%)	1 (33.3)	2 (66.7%)	3
Obstetrics	0 (0.0%)	16 (88.9%)	2 (11.1%)	18
Pediatrics	0 (0.0%)	13 (92.9%)	1 (7.1%)	14
Long-term/rehabilitation	0 (0.0%)	13 (92.9%)	1 (7.1%)	14
Outpatient clinic	2 (7.7%)	23 (88.5%)	1 (3.8%)	26
Other	4 (10.0%)	36 (90.0%)	0 (0.0%)	40

DISCUSSION

Healthcare-related infections are the foremost threat to patients' health and safety, but by carrying out appropriate hand hygiene practices, this threat can be controlled. The present study was carried out to measure knowledge related to hand hygiene practices among healthcare experts in tertiary care hospitals. Results demonstrated that the majority of healthcare professionals claimed that they attended formal hand hygiene training. Similar observations by Goyal *et al.*, and Aledeilah *et al.*, related to prior HH training have been found in the latest research [14, 15]. Those trainings helped them to regulate the ongoing practices and control infection rates in their hospitals. Further, the findings revealed that moderate knowledge related to hand hygiene practices has been observed among healthcare professionals. These findings are found to be consistent with the previous studies conducted in Pakistan and at the international level [6, 16, 17]. The possible explanation for this ratio can be the training which they received in the past three years. Moreover, results depicted that most of the healthcare workers working in the different departments such as internal medicine, surgery, the intensive care unit, and the outpatient clinic had moderate knowledge related to hand hygiene. Most of

them already knew the significance of these simple practices and their adherence to hand hygiene practices helps to prevent those deadly infections. Furthermore, the need for compliance and adherence related to hand cleanliness practices in hospitals has increased due to the COVID-19 pandemic [18]. Alternatively, there are a few departments that need more attention and training related to knowledge and practices of hand hygiene. Findings demonstrated that more than half of the study participants (68%) conceded healthcare workers' hands as the main route of transmission between patients. These results are comparable with the study in India [19]. They also highlighted that healthcare professionals' hands are the most frequent way of transmitting germs. While 93.2% of respondents recognized the "before" and "after" touching the patient as the most common gateway to the cross-transmission of germs. These findings highlighted that healthcare professionals have the realization of hand hygiene practices for patient safety and minimizing infectious diseases [20]. Although the moderate hand hygiene practices knowledge can be attributed to the past training session and activities in hospital settings. But still, certain domains of hand hygiene knowledge areas need to be highlighted by initiating different pieces of training

sessions and activities. By looking at the previously available data, it can be concluded that regardless of different designed interventions to enhance the knowledge and compliance rate, the ratio is still very disappointing. Establishing a check and balance such as an observational check can regulate compliance and adherence to these simple HH practices. In the future, more observational studies need to be conducted to monitor the frequency of adherence and compliance with hand hygiene practices. Furthermore, strong need to carry out cross-cultural studies on hand hygiene practices related to knowledge and figure out the hidden motivating factors due to which they have better compliance as compared to third world countries.

CONCLUSIONS

The study findings showed that moderate knowledge had been observed among healthcare professionals working in different departments. The internal medicine and emergency unit had moderate to good knowledge of hand hygiene practices. Thus, there is a strong demand for different hand hygiene activities, training sessions, and awareness seminars to prevent the rate of health-related infections by opting for simple hand hygiene practices.

Authors Contribution

Conceptualization: NG

Methodology: NG

Formal analysis: SK

Writing-review and editing: SK, NG, SA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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