



## **Perception, Patterns and Facts: A Study Based on Hand Hygiene among Pharmacy Clerkship Students during COVID-19 Epidemic in Karachi**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Aims:** The objective of the study is to explore the knowledge and attitude towards hand hygiene practices among 4<sup>th</sup> year and 5<sup>th</sup> year clerkship pharmacy students in a private medical university in Karachi, Pakistan.

**Methodology:** A cross-sectional study was conducted for the period of 2 months (November 2020- December, 2020). A well-structured questionnaire was developed to determine the current habit of students' hand hygiene. The statistical data assimilation recorded through SPSS version 20 to integrate numerical significance.

**Results:** Questionnaire was distributed to 193 students out of which, one hundred Eighty (n=180/193) students participated in this study (response rate 93.26%. Although the majority of students had a fair knowledge of hand hygiene practices, a number of them had few misconceptions. The hand sanitizing practices while encountering patient or prior to patient's contact showed the 88.3% correct answers. In our study the 75% of participants correctly answered that "traditional hand washing (apply enough soap to cover and rub hands and clean in between the fingers using water) can help stop picking up infections and spreading them to others." The

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current study showed that 82.2 percent Healthcare providers are educating patients and their families about hand hygiene and its importance, the 23.3% negative response was collected in context to inspected the particular World Health Organization (WHO) and center of disease control (CDC) rules for hand cleanliness.

**Conclusion:** The current study showed that students had adequate knowledge regarding the importance of hand hygiene. However, there were few students who had inadequate knowledge related to WHO and CDC rules for hand cleanliness which can improve by providing appropriate education and guidance.

*Keywords: Hand hygiene; knowledge; attitude; practice; COVID-19.*

## 1. INTRODUCTION

“Hand washing is the rubbing together of all surfaces and crevices of the hands using a soap or chemical and water. Washing hand is a part of routine practice to keep someone healthy and provide protection against the spread of a variety of pathogens. Various factors emphasize the key time to monitor both hygiene level and control of microbial transmission. These are common with when hands are visibly soiled, before leaving and after arriving at public places, between client contacts, before and after eating food. Similarly, while removing used gloves, or touch a contaminated surface or objects, blow your nose, cough and sneezing on hands. Moreover, person who comes in contact with body fluids and when performing invasive procedures or handling of contaminated equipment. The exact duration of time required for hand washing depends on the circumstances. A washing time of 10 to 15 seconds is recommended to remove transient flora from the hands. During pandemic of COVID-19, it is advised to wash hands for up to 20 seconds or use a hand sanitizer containing at least 60% alcohol. High-risk areas, such as nurseries, usually require about a 2-minute hand wash. Soiled hands usually require more time” [1]. “World health organization (WHO) reports an overall estimate of about 1.4 million patients in developed and developing countries affected anytime by health care associated infections. In the wake of the growing burden of health care associated infections, the increasing severity of illness and complexity of treatment, superimposed by multi-drug resistant pathogenic infections, health care workers are again encouraging to use methods that prevent infections by simple measures like hand hygiene. This is because enough scientific evidence supports the observation that if properly implemented, hand hygiene alone can significantly reduce the risk of cross-transmission of infection in healthcare facilities” [2]. “Hand hygiene is a milestone of infectious disease

control, and promotion of improved hand hygiene has been recognized as an important public health measure. It has long been recognized to be a convenient, useful and also cost-effective means of preventing communicable diseases” [3]. “Effective hand hygiene can lower the prevalence of healthcare associated infections. Unfortunately, the prevalence of these infections continues to rise and poses a challenge to healthcare providers. Healthcare associated infections due to poor hand hygiene has been linked to an unacceptably high level of morbidity, mortality and healthcare costs. In developing countries its prevalence is found to be as high as 19%” [4]. Despite the relative simplicity of this procedure, compliance with hand hygiene among health care providers is as low as 40%. To address this problem, continuous efforts are being made to identify effective and sustainable strategies. One of such efforts is the introduction of an evidence-based concept of “My five moments for hand hygiene” by World Health Organization. These five moments that call for the use of hand hygiene include the moment before touching a patient, before performing aseptic and clean procedures, after being at risk of exposure to body fluids, after touching a patient, and after touching patient surroundings. This concept has been suitably used to improve understanding, training, monitoring, and reporting hand hygiene among healthcare workers [5]. This study has been conducted to explore the knowledge, attitude and perceptions of hand's hygiene practice among university Pharmacy students in order to develop appropriate strategies that can promote hand washing compliance.

## 2. METHODOLOGY

### 2.1 Study Design

A cross-sectional study was conducted among pharmacy students, in a well reputed private University. This design was chosen because it enables the participants in collection of

quantitative data on multiple variables at a single point in time [6]. The study was conducted for the period of 2 months starting from November 2020 to December, 2020.

## 2.2 Study Population

The population for this study was all undergraduates of Pharm-D Students Fourth and Final year during the November to December 2020.

## 2.3 Eligibility Criteria

Inclusion Criteria: All 4<sup>th</sup> and 5<sup>th</sup> year Pharm-D students involved in Clerkship, who were available during data collection and interested in participating in the study were included.

## 2.4 Exclusion Criteria

Pharm-D students of 4<sup>th</sup> and 5<sup>th</sup> year who were not interested in participating in the study were excluded.

## 2.5 Questionnaire and Data Collection

The questionnaire was administered to explore students' demographical data as well as their knowledge and attitudes towards, hand hygiene. Generally first part based on demographic expressions like gender, peer group and academic level. In second part knowledge regarding hand washing was examined by dichotomous questions generally close ended and used to get most appropriate respondent's opinion or clear distinctions of qualities. Third part consists of questions regarding students perception towards hand hygiene were examined by five formatted questions; they were opinion-based subjective questions and explored aspects relating to hand hygiene in terms of importance, education, compliance, and role models. The questionnaire was developed based on a

literature review (previous studies as well as WHO and CDC guidelines). All questions were peer-reviewed by two public health/infection control healthcare professionals and piloted on a group of students to ensure proper understanding and interpretation of questions. After collecting the responses, data were decoded by using Microsoft Excel sheet (Microsoft Company, Redmond, WA, USA). Categorical data were presented as numbers and percentages.

## 3. RESULTS

Out of total 180 students, the majority of participants were females (83.3%), however 16.7% were males. The age group of students was divided into 2 different categories i.e., 19-20 years which showed only 3.3% response, while majority were between 21-24 years old.

The Table 2 expressed the knowledge of Pharmacy students regarding hand hygiene and hygiene practices. The detail of students' response and correct answers are expressed in Table 2.

The attitudes of students regarding the hand hygiene is expressed in Table 3.

## 4. DISCUSSION

The current study explored the pharmacy students' knowledge regarding hand hygiene. The hand hygiene is a behavior considered as an essential part of overall hygiene of body [7]. The hand washing with water and soap removes the considerable number of pathogens and colonizing flora mechanically [8,9].

"Hand hygiene is the easiest implemented interventional practice that can avoid many infections. Our current study will beneficially

**Table 1. Demographic characteristics of Participants**

Variables		Frequencies (n)	Percentages (%)
Age Groups	19 to 20 years	6	3.3%
	21 to 24 years	174	96.7%
Gender	Male	30	16.7%
	Female	150	83.3%
Academic-Level (Pharmacy)	4th year students	89	49.4%
	5 <sup>th</sup> year students	91	50.6%

**Table 2. Student's knowledge regarding hand hygiene**

SI. No	Questions	Frequency(n)	Percentages (%)	Correct Answer (Y/N)
1	The number of germs decreases by using traditional hand washing (water plus regular soap) method.	135	75%	yes
2	Wearing gloves on hands eliminate the necessity to wash hands	136	75.6%	no
3	Hand washing is required before and after wearing gloves	152	84.4%	yes
4	Using instant hand sanitizer to quickly wash hands is always adequate	117	65%	no
5	Must use anti-septic soap for proper hand washing	17	9.4%	no
6	Must use both anti-septic soap plus hand sanitizer for proper hand washing	72	40%	no
7	Subsequent to washing hands, turn off water taps with your hands	85	47.2%	no
8	Subsequent to washing hands, turn off taps using piece of paper towel	144	80%	yes
9	Perform hand cleanliness just prior to encountering patient (even without performing physical examination)	36	20%	no
10	Perform hand hygiene only after encountering patient (even without performing physical examination)	110	61.1%	no
11	Perform hand hygiene before and after encountering each patient (even without doing physical examination)	150	83.3%	yes
12	Enforce hand hygiene only before physically examining the patient	111	61.7%	no
13	Enforce hand hygiene only after physically assess the patient	98	54.4%	no
14	Carry out hand hygiene before and after physically assess the patient	159	88.3%	yes
15	Implement hand hygiene only after contact with secretions/bodily fluids (respiratory secretions, saliva, vomit and blood)	69	38.3%	no
16	On unsoiled hands, an alcohol-based hand rub is recommended over an anti-septic soap hand washing	133	73.9%	yes
17	On unsoiled hands, an alcohol-based hand rub is recommended over a 3-minute surgical scrub	41	22.8%	no
18	Hand washing with regular soap, instead of anti-septic soap, is better in limiting the transmission of clostridium difficile infection	44	24.4%	yes

**Table 3. Student’s attitudes toward several aspects concerning hand hygiene**

<b>S.NO</b>	<b>Questions</b>	<b>Yes (n)</b>	<b>Percentage</b>	<b>NO(n)</b>	<b>Percentages (%)</b>
1	Prior to beginning my clinical preparing, I inspected the particular WHO and CDC rules for hand cleanliness.	138	76.7%	42	23.3%
2	Healthcare providers are educating patients and their families about hand hygiene and its importance	149	82.2%	31	17.2%
3	I need appropriate hand cleanliness practices because no living examples (that is, healthcare providers) are performing them.	108	60%	72	40%
4	Appropriate hand cleanliness is an important matter to be emphasized in educational curricula and healthcare centers.	157	87.2%	23	12.8%
5	Improper hand cleanliness leads to a patient's morbidity and mortality.	145	80.6%	35	19.4%

contribute to the production of data about clerkship students' knowledge of hand hygiene in Pakistan. Our study endeavored to examine clerkship Pharmacy students' knowledge of, and attitudes towards, hand hygiene as one of the most important infection control measures. It revealed that students' knowledge of hand hygiene is inadequate as observed in the study" [10]. "Several students wrongly answered some basic hand hygiene questions. The data represented the highest response rate of 96.7%, with majority of female participants. 83.3% females and 16.7% males showed the relevant results found in the previous study" [11]. According to CDC guidelines on hand hygiene, "washing hands with water and regular soap is the best available method to decrease the number of microbes on them in the vast majority of circumstances" [12]. The importance of hand-washes and hand-sanitizers was assessed in context to the knowledge of participants which showed majority had significant understanding of importance of hand-washes and similar results were addressed in a study. The hand sanitizing practices while encountering patient or prior to patients contact showed the 88.3% correct answers conversely the results found in a study [13]. "Students showed incomplete knowledge regarding the use of hand sanitizers. In our study the 75% of participants correctly answered that traditional hand washing (water plus regular soap) decreases the number of germs". Conversely, in a study, 88% of clerkship medical students answered this question correctly" [14]. "The response to When water and soap are unavailable — which can be the case in several occasions in healthcare settings students should look for an alternative, such as hand sanitizers the similar results were expressed in a past study" [15]. The attitude towards the hand hygiene and practices was assessed in the other part of the study, the relevant WHO's guidelines were asked and the practices with those guidelines was observed during the study 76.7% positive Responses [16]. However, the 23.3% negative response was collected in context to inspect the particular WHO and CDC rules for hand cleanliness. The significance of patient's education regarding hand hygiene has been explained several times but it was observed that in developing countries there were very few studies conducted on importance of hand hygiene therefore, there is need to fill this knowledge gap. The health care workers should own this responsibility [17]. "The current study showed 82.2% healthcare providers are educating patients and their families about hand

hygiene and its importance, however the 17.2% lacking the practice these findings are in agreements to the past study" [18]. To maintain the appropriate hand hygiene and cleanliness requires the adequate understanding, our study concluded that 87.2% participants agreed to appropriate hand cleanliness matters and emphasized in educational curricula and healthcare centers similarly concluded in a study [19]. Various studies showed that appropriate hand cleanliness and hygiene is an integral part of health care system which can lead to serious consequences, the majority 80.6% agreed that improper hand cleanliness leads to a patient's morbidity and mortality similarly addressed in a study [20,21]. The authors from the different part of the world have stressed on the topic of hand hygiene and the importance of hand hygiene in health care environment, hence this is educational responsibility of the health care providers to focus on strictly compliance and of hand hygiene practices.

## 5. CONCLUSION

Hand hygiene is the easiest implemented interventional practice that can avoid many infections. The current study showed that students of 4<sup>th</sup> year and 5<sup>th</sup> Pharmacy department had adequate knowledge regarding the importance of hand hygiene, however emphasize should be made on the correctly practicing the hand hygiene and this can be achieved by appropriate education and guidance.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Jemal S. Knowledge and practices of hand washing among health professionals in Dubti Referral Hospital, Dubti, Afar, Northeast Ethiopia. *Advances in Preventive Medicine*. 2018;2018.
2. Mohesh G, Dandapani A. Knowledge, attitude and practice of hand hygiene among medical students-a questionnaire based survey. *Unique J Med Dent Sci*. 2014;2(03):127-31.

3. Sultana M, Mahumud RA, Sarker AR, Hossain SM. Hand hygiene knowledge and practice among university students: Evidence from private universities of Bangladesh. *Risk management and Healthcare Policy*. 2016;9:13.
4. Ariyaratne MH, Gunasekara TD, Weerasekara MM, Kottahachchi J, Kudavidanage BP, Fernando SS. Knowledge, attitudes and practices of hand hygiene among final year medical and nursing students at the University of Sri Jayewardenepura; 2015.
5. 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.
6. Bryman, A. *Social research methods*. 2nd ed. New York, NY: Oxford University; 2012.
7. Jumaa PA. Hand hygiene: Simple and complex. *International Journal of Infectious Diseases*. 2005;9(1):3-14.
8. Longtin Y, Sax H, Allegranzi B, Schneider F, Pittet D. Hand hygiene. *N Engl J Med*. 2011;364(13):e24.
9. Pittet D, Hugonnet S, Harbarth S, Mourouga P, Sauvan V, Touveneau S, Perneger TV. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *The Lancet*. 2000; 356(9238):1307-12.
10. Pittet D. Improving adherence to hand hygiene practice: a multidisciplinary approach. *Emerging infectious diseases*. 2001;7(2):234-40.
11. Pittet D. Improving compliance with hand hygiene in hospitals. *Infection Control & Hospital Epidemiology*. 2000;21(6):381-86.
12. Pittet D, Simon A, Hugonnet S, Pessoa-Silva CL, Sauvan V, Perneger TV. Hand hygiene among physicians: performance, beliefs, and perceptions. *Annals of Internal Medicine*. 2004;141(1):1-8.
13. Santosaningsih D, Erikawati D, Santoso S, Noorhamdani N, Ratridewi I, Candradikusuma D, Chozin IN, Huwae TE, van der Donk G, van Boven E, Verbrugh HA. Intervening with healthcare workers' hand hygiene compliance, knowledge, and perception in a limited-resource hospital in Indonesia: A randomized controlled trial study. *Antimicrobial Resistance & Infection Control*. 2017;6(1):1-10.
14. Labrague LJ, McEnroe-Petitte DM, Van de Mortel T, Nasirudeen AM. A systematic review on hand hygiene knowledge and compliance in student nurses. *International Nursing Review*. 2018;65(3):336-48.
15. Van De Mortel TF, Kermode S, Prozano T, Sansoni J. A comparison of the hand hygiene knowledge, beliefs and practices of Italian nursing and medical students. *Journal of Advanced Nursing*. 2012;68(3):569-79.
16. Novák M, Breznický J, Kompaníková J, Malinovská N, Hudečková H. Impact of hand hygiene knowledge on the hand hygiene compliance. *Medicinski Glasnik*. 2020;17 (1).
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):5159-65.
18. Huang TT, Wu SC. Evaluation of a training programme on knowledge and compliance of nurse assistants' hand hygiene in nursing homes. *Journal of Hospital Infection*. 2008;68(2):164-70.
19. Scheithauer S, Haefner H, Schwanz T, Lopez-Gonzalez L, Bank C, Schulze-Röbbecke R, Weishoff-Houben M, Lemmen SW. Hand hygiene in medical students: Performance, education and knowledge. *International Journal of Hygiene and Environmental Health*. 2012;215(5): 536-39.
20. Fisher D, Pereira L, Ng TM, Patlovich K, Teo F, Hsu LY. Teaching hand hygiene to medical students using a hands-on approach. *Journal of Hospital Infection*. 2010;76(1):86-7.
21. Melenhorst WB, Poos HP, Meessen NE. Medical students need more education on hygiene behavior. *American Journal of Infection Control*. 2009;37(10):868-69.

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