Knowledge Of Hand Hygiene Among Young Medical Students In The Faculty Of Medicine And Pharmacy, University Ibn Zohr: A Cross-Sectional Study During A Pandemic COVID-19

R.Chakiri[a,b]; L.Lahlou[c,d] ; S.Wakrim[e]; Z.Lemkhenete[b,f]; F.Ajdi[g]; Y.Khabbal[h]

a: Département de Dermatologie, CHU d'Agadir, Agadir, Maroc

b : Équipe de Recherche Maladies infectieuses, Biologie Cellulaire et Moléculaire, Faculté de Médecine et de Pharmacie d'Agadir, Université Ibn Zohr, Agadir, Maroc

c : Département d'Epidémiologie et de Médecine communautaire, Faculté de Médecine et de Pharmacie d'Agadir, Agadir, Maroc

d : Laboratoire de Biostatistique, Recherche clinique et Epidémiologie, Faculté de Médecine et de Pharmacie, Université Mohamed V, Rabat, Maroc

e : Département de Radiologie, CHU d'Agadir, Agadir, Maroc

f : Département de Parasitologie et Mycologie, CHU d'Agadir, Agadir, Maroc

g : Département d'Endocrinologie et Maladies Métaboliques, CHU d'Agadir, Agadir, Maroc

h : Équipe de recherche de Médecine translationnelle et épidémiologie. Laboratoire des sciences de la santé. Faculté de Médecine et de Pharmacie d'Agadir, Université Ibn Zohr, Agadir Maroc

Abstract

Background. The practice of hand hygiene remains one of the most effective and important methods to minimize COVID-19 infection. By keeping in mind the importance of hand hygiene, this study aims at investigating knowledge towards hand hygiene among medical students in the Faculty of Medicine and Pharmacy.

Methods. A cross-sectional study includes 212 medical students. This study was completed in two months; from April to May 2020. The World Health Organization (WHO) hand hygiene questionnaire was used and data were analyzed on SPSS-13.0

Results. A significant proportion of the participants 151 (71,69%) had no training about hand hygiene. Almost half of the participants 124 (58,5%) had moderate knowledge on hand hygiene. Females had significantly better knowledge than males regarding the kind of hand hygiene actions for preventing germ transmission to the health-care worker after touching a patient [68 (64,2%) Vs. 38 (35,8%); P=0.037]. Female participants also had a significantly better knowledge than males regarding the type of hand hygiene technique needed before giving an injection [68 (64,2%) Vs. 38 (35,8%); P=0.015] and after visible exposure to blood [121 (75,6%) Vs. 39 (24,4%); P=0.026].

Conclusion. The awareness about hand hygiene knowledges among medical students is low. Nearly 71,69% (n=151) of the respondents never received any formal training in hand hygiene. To prevent the spread of infections in healthcare settings, medical students should be given proper training in hand hygiene from the first year of the medical curriculum. This should be done by running workshops and annual seminars on hand hygiene.

Key words: Hand; hygiene; knowledge; medical students; hand rubbing; hand washing; Pandemic; Covid-19; infection; study

Introduction

The COVID-19 pandemic has emphasized the importance of optimal hand hygiene practice to reduce cross-contamination and the spread of the SARS-COV-2 virus that causes the disease [1].

Healthcare-associated infections are one of the principal public health problems among many countries all over the world [2, 3]. Hand hygiene is considered the most important measure to reduce healthcare-associated infections and prevent the cross transmission of microorganisms [4, 5]. However, compliance with hand hygiene among healthcare workers is low as 40%, despite the simplicity of hand hygiene procedure [3]. Hand hygiene has been improved by raising the awareness, training and behavior alteration of healthcare workers [6]. Several studies reported better hand hygiene compliance among healthcare workers with better knowledge and attitudes toward universal precaution [7, 8].

There is a paucity of studies exploring medical students' knowledge about hand hygiene in our country. Therefore it is essential to investigate the medical students' knowledge about hand hygiene, so that appropriate strategies can be developed to promote hand hygiene compliance especially during pandemic situation like COVID-19.

This study aimed to assess the knowledge of medical students toward hand hygiene in Faculty of Medicine and Pharmacy in University Ibn Zohr.

Methods

Study design

A cross-sectional study was conducted in Faculty of Medicine and Pharmacy Agadir, University Ibn Zohr. Which is a new Medical Faculty in south of Morocco. The study was conducted during the pandemic of COVID-19 from April 2020 to May 2020

Participants

The study included all medical students, we note that so far we have only the four first levels of medical students: first, second, third and fourth year medical students at Faculty of Medicine and Pharmacy in the University of Ibn Zohr. Both male and female students were included in the study.

Data collection and statistical analysis

A questionnaire containing a set of questions regarding hand-hygiene knowledge were sent via mail to all participants . Knowledge was assessed by using WHO hand questionnaire for healthcare workers. We also collected the data about the respondents' characteristics such as age, year of study, gender. The questionnaire comprised of variety of questions including: "questions about training attended on hand hygiene and using an alcohol-based hand rubbing method for hand hygiene".

A scoring system was used where 1 point was awarded for each correct response to knowledge.

The cutoff values to determine good, moderate and poor levels were taken from previously published studies. A score>75 % was considered good, 50-74% moderate and <50% poor.

After data collection, the data were coded, entered, cleaned and stored using SPSS Version 13.0. the qualitative variables were described in terms of number and percentage then compared by Chi-square and exact fisher tests according to the conditions of application of each one of the tests.

Quantitative variables have been described as mean and standard deviation.

For all statistical tests, p-value<0.05 was considered significant.

Results

A total of 212 students participated in this survey. Out of 212 participants, 152 (71,7%) were females, and 60 (28,3%) were males. The mean age of the participants was 18,90 ±5,59. A significant proportion of the respondents 151 (71,69%) had no training about hand hygiene and 151 (71,2%) of them were using an alcohol-based hand rubbing method for HH.

Table 1: General characteristic of the participants

Variables	N(%)
Age (Years)(Mean±SD)	18,90±5,59
Gender	
Female	152(71,7%)
Male	60(28,3%)
Year of study	
First	58 (27,4%)
Second	72(34,0%)
Third	41(19,3%)
Fourth	41(19,3%)

Notes: N, number of study participants; %, percentage

The knowledge on hand hygiene was moderate (58,5%, 124 out of 212) among the total study sample population. 2,4% of the participants (5 out of 212) had poor knowledge and 39,2% had good knowledge.

There were a significant difference between females and males regarding the use an alcohol-based hand rub for HH (p=0.001).

There were no significant differences of knowledge between females and males regarding the kind of HH actions for preventing germ transmission to patients. On the other hand, females had better knowledge than males regarding the kind of HH actions for preventing germ transmission to the health-care worker in one item (after touching a patient) [68 (64,2%) Vs. 38 (35,8%); P=0.037].

About two third of the participants 148 out of 212 (69,8%) had correct knowledge about the least time required for alcohol-based hand rubbing to eradicate the majority of the microbes on hands. There was significant difference found between males and females about this item.

Females had better knowledge than males regarding the type of HH technique needed before giving an injection [68 (64,2%) Vs. 38 (35,8%); P=0.015] and after visible exposure to blood [121 (75,6%) Vs. 39 (24,4%); P=0.026].

Besides, there was no significant variance between both genders' knowledge regarding the avoidance of factor that is linked with the augmented probability of colonization of hands with damaging germs except in the Wearing jewelry [143 (74,1%) Vs. 50 (25,9%);

P=0.014] and regular use of hand cream [124 (68,1%) Vs. 58 (31,9%); P=0.005]

Table 2: participants' response to questions and gender-wise comparison regarding hand hygiene.

Questions	Yes N(%)	No N(%)	Female N(%)	Male N (%)	p-value
Routinely use an alcohol-based rub for HH	Yes=151(71,2%)	No=61(28,8%)	118(77,6%)	33 (55,0%)	0,001
The following hand hygiene actions prevents transmission of germs to the patient?					
a. Before touching a patient (yes)	Yes= 189 (89,15%)	No=23 (10,84%)	73,5%	26,5%	0,087
b. Immediately after a risk of body fluid exposure (yes)	Yes=73 (34,4%)	No=139(65,56%)	71,2%	28,8%	0,913
c. After exposure to the immediate surroundings of a patient (no)	Yes=65(30,66%)	No=147(69,3%)	72,8%	27,2%	0,596
d. Immediately before a clean/aseptic procedure (yes)	Yes=143 (67,5%)	No=69(32,54%)	70,6%	29,4%	0,619
Which of the following hand hygiene actions prevents transmission of germs to the health-care worker?					
a. After touching the patient (yes)	Yes=171 (80,7%)	No=41(19,33%)	74,9%	25,1%	0,037
b. Immediately after a risk of body fluid exposure (yes)	Yes=173(81,6%)	No=39(18,39%)	73,4%	26,6%	0,244
c. Immediately before a clean/aseptic procedure (no)	Yes=53(25%)	No=159(75%)	74,2%	25,8%	0,159
d. After exposure to the immediate surroundings of a patient (yes)	Yes=168(79,2%)	No=44(20,75%)	72%	28%	0,837
Which of the following statements on alcohol-based hand rub and hand washing with soap and water are true?					
a. Handrubbing is more rapid for hand cleansing than handwashing (true)	True=168(79,2%)	False=44(20,75%)	72%	28%	0,837
b. Handrubbing causes skin dryness more than handwashing (false)	True=177(83,49%)	False=35 (16,5%)	74,3%	25,3%	0,710
c. Handrubbing is more effective against germs than hand washing (false)	True=70(33,01%)	False=142 (67%)	75,4%	24,60%	0,093
d. Handwashing and handrubbing are recommended to be performed in sequence (false)	True=126 (59,43%)	False=86 (40,60%)	25,6%	74,4%	0,468
What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands?					
a. 1 min	28(13,2%)				
b. 20 s (True)	148(69,8%)		104(70,3%)	44(29,7%)	0,483
c. 10 s	32(15,1%)				
d. 3 s	4(1,9%)				
Which type of hand hygiene method is required in the following situations? a. Rubbing b. Washing c. None					
a. Before palpation of the abdomen (rubbing)	108 (50,9%)	104(49,05%)	75,9%	24,1%	0,164
b. Before giving an injection (rubbing)	106(50%)	106(50%)	64,2%	35,8%	0,015
c. After removing examination gloves (rubbing/washing)	198(93,4%)	14(6,60%)	70,7%	29,3%	0,228
d. After making a patient's bed (rubbing)	151(71,2%)	61(28,77%)	67,9%	32,1%	0,481
e. After visible exposure to blood (washing)	160(75,5%)	52(24,52%)	75,6%	24,4%	0,026
Which of the following should be avoided, as associated with increased likelihood of colonization of hands with harmful germs?					
a. Wearing jewelry (yes)	193(91,0%)	19(8,96%)	74,1%	25,9%	0,014
b. Damaged skin (yes)	162(76,4%)	50(23,58%)	71%	29%	0,679
c. Artificial fingernails (yes)	199(93,9%)	13(6,13%)	71,9%	28,1%	0,840
d. Regular use of a hand cream (no)	182(85,8%)	30(14,15%)	68,1%	31,9%	0,005

Discussion

This study described the knowledge of hand hygiene among medical students during the pandemic of COVID-19. Hand hygiene is considered the major effective preventive measure against health-care-associated infections, which can lead to reduce mortality and morbidity [9]. Thus, Hand hygiene with alcohol-based handrub (ABHR) is widely used around the world as one of the most effective, simple and low-cost procedures against COVID-19 cross-transmission [10]. Our study showed that 71,2% of participants used alcohol-based hand rub routinely, this can be explained by the current pandemic period.

The present study showed a significant proportion of the participants with no training about hand hygiene, which could explain the moderate level of knowledge on hand hygiene.

This result is in accordance to the similar study conducted in Sri Lanka, India and Nepal[11].

Knowledge about HH before touching the patient was 89,15% and after body fluid exposure was 34,4%. Marwan et al., stated that 89,2% of medical students knew about HH before getting in contact with patients and 74,4% after contact of fluid secretion [12], while a Sri Lankan study asserted that 93% of medical students knew about HH before touching a patient and 80% after contact of fluid secretion [3].

In the present study, the majority of participants responded correctly about the importance of HH for a clean/aseptic practice, following interaction with body fluid, before and after touching the patient, and exposure to immediate surroundings of a patient. Our results are similar to that of Kamble et al and Bakarman et al. [12, 13].

About four fifths (79,2%) of the participants agreed that handrubbing is more rapid than washing and 83,49% approved that hand washing dried the skin more than hand rubbing. Bakarman et al reported that 55,4% and 49,2% of medical students were aware of this fact [12].

According to the guidelines of the CDC (2015), hand washing with water and regular soap is the best available method to limit germ numbers. Hand washing is especially important in highly contaminated or greasy hands [14].

About two-third of the participants agreed that hand rubbing is less effective than washing and 40,60% agreed that hand washing and hand rubbing should not be performed in sequence. Whereas Bakarman et al reported 66% and 45% of medical students were aware of both these facts [12].

Awareness of the effective time and appropriate use of alcohol-based hand rubbing is very important in preventing the spread of microbes [15]. More than two-third (69,8%) of participants revealed the appropriate time required for alcohol-based hand rubbing to eradicate most microorganisms on the hands, while Amin et al reported only 42% and Bakarman et al reported only 30% of the knowledge of this fact [12, 16]. Our finding in this fact can be explained by the awareness of the participants regarding the minimum time required for effective hand hygiene in this pandemic period of COVID-19.

Differentiation between the use of hand rubbing and hand washing in different conditions was deficient among participants , and 50,9%, 50% and 71,2% of participants declared that rubbing was the method of HH before palpation of the abdomen, before injection and after making a patient's bed. However, 75,5% of participants reported that hand washing was the method of hygiene after contact with blood.

Participants reported that wearing jewelry (91%), artificial fingernails (93,9%), skin injuries (76,4%) should be avoided, as they are related with the augmented probability of colonization of hands with detrimental germs. Also, they agreed that consistent application of hand cream (85,8%) does not increase that risk. Our results are better than those of Bakarman et al. [12]

In this study, females students had significantly better knowledge than males regarding the kind of HH actions for preventing germ transmission to health-care workers after touching a patient. Females had better significant knowledge than males regarding the type of HH needed before giving an injection and after exposure to blood. Females also had a better significant knowledge regarding the avoidance of wearing jewelry which increase the microbial colonization of the hands and that the regular use of hand cream is not linked with the hands' contamination.

Our study shows that our students didn't have sufficient knowledge regarding hand hygiene. This explains the need to conduct the training sessions to emphasize on the techniques and importance of hand hygiene prior to their internship in the hospital.

There are some limitations to our survey. This is a questionnaire-based study, so the authenticity of the responses cannot be ensured. It is a single center study so it is quite possible that in other medical institutions of Morocco, the students' knowledge may be better or vice versa.

Conclusion

Our results show that the majority of the participants' had a moderate knowledge regarding hand hygiene. However, female students had a better knowledge as compared to male students.

We suggest, to improve the knowledge of our students on hand hygiene, to include hand hygiene training and programs in the academic curriculum, especially the preclinical educational training programs in all medical schools.

Conflict of interest: None

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