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Barriers and attitudes with hand hygiene performance among nursing staff during COVID-19 pandemic

Mohammed Hindi Alwatifi
Bachelor's degree in Nursing from University of Kufa, College of Nursing, Academic Nurse Work at Ministry of Health / Babylon Health Directorate, Iraq

Wafaa Abd Ali Hattab
Assist. Prof. Dr. working at the University of Baghdad, college of nursing, Adult Nursing Department, Iraq.

***Abstract*---**This study aimed to fill this gap by assessing the barriers and attitudes regarding hand hygiene practice among nursing staff during the COVID-19 pandemic. Methods: A descriptive cross-sectional design was carried out in three hospitals' Intensive Care Units from the period (20th December 2021 to 30th January 2022). A non-probability sampling method consists of (130) nurses who were selected purposively based on the study criteria. Results: The majority of the study participants (73.1%) had negative attitudes towards hand hygiene. The main barriers cited for not observing hand hygiene practices consistently were as heavy workload (93.1%), infrastructural deficit (90.8%), skin irritation (85.4%), and insufficient time (76.2%), respectively.

***Keywords*---**Barriers, Attitudes, Hand Hygiene, Nurse, COVID-19.

Introduction

Infection control and prevention are the cornerstones in preventing and reducing microorganisms that cause harm to patients, health care workers (HCWs), and society in general (World Health Organization [WHO], 2020). Health-care-associated infections (HCAIs) refer to infections that patients contract while in the hospital, in which they were not infected before admission and whose symptoms show about 48 hours or more after admission to the health care setting (Mohammed Ali et al., 2019). Hospital infections are generated by the hands of staff in around half of the cases (Khodadadi, 2019). HCWs are on the front lines of the COVID-19 outbreak, and their continual exposure to infected patients and contaminated surfaces puts them at risk of contracting and transferring the disease (Phan et al., 2019). Nurses account for the biggest proportion of HCWs. Because they spend more time with patients than any other HCWs, their

adherence to hand washing requirements appears to be more important in reducing disease transmission (Liyew et al., 2020).

Hand hygiene is both inexpensive and effective, and it is estimated that between 15% and 30% of HCAIs can be averted with this method. However, HCWs' adherence to hand hygiene standards is limited (Ataiyero et al., 2019). Another study also reported that hand hygiene is the most basic and effective way to avoid HAIs (Kamanga et al., 2021). In this perspective, hand hygiene is one of the majority important procedures to avoid the transmission of the SARS-CoV-2 virus, which causes Coronavirus disease (Sahiledengle et al., 2020).

HCAIs are among the top ten causes of death in hospitals around the world (Haque et al., 2018). At any given time, 7 out of every 100 hospitalized patients in developed countries and 10 out of every 100 hospitalized patients in developing countries suffer from at least one HCAI (Haque et al., 2018). In addition, it estimates that 1.7 million HCAIs cause 99000 deaths in the United States per year (Alegbeleye et al., 2020). Even though handwashing is critical for reducing and controlling hospital-acquired infections, there has been a lack of compliance with the simple procedure. Nonetheless, past research has found that hand hygiene compliance was low in Iraqi nurses (Bakey, 2016). Moreover, Nuwagaba (2021) recommended conducting studies to assess the barriers to hand hygiene in ICUs. This study aimed to assess nurses' attitudes regarding hand hygiene practice. Also, the study will find the barriers that reduce hand hygiene performance among nursing staff at intensive care units. The researchers tried to answer the following questions; 1-What is the direction of nurses' attitude toward hand hygiene practice in the intensive care unit? 2-What are the most important barriers to hand hygiene among nurses in the intensive care unit?

Method

A quasi-experimental design of the study has been used in the present study to assess the Study Design and Population*:* A descriptive survey design was used to achieve the study's objectives. Nurses who work in ICUs were the population in this study.

Sampling and Sample Size*:* A non-probability (purposive) sampling method was used to collect the data. The inclusion criteria were nurses with at least one year of experience and work in the morning shift. While exclusion criteria included those who work outside the isolation wards (intensive care units). The total number of nurses who work in ICUs in the target hospitals was 195 at the time of the data collection. The minimum sample size was collected based on a confidence level of 95% and a margin of error of 5%. The minimum sample size was 130.

Data Collection and Setting*:* The data were collected from 20th December 2021 to 30th January 2022 using a self-administered questionnaire that was adapted based on the WHO Guidelines on hand hygiene in a health care setting (WHO, 2009). The data was collected from three hospitals; Marjan Teaching Hospital, Al-Hilla Surgical Hospital, and Imam Sadiq Hospital in Babylon Governorate in Iraq.

***Instrumentations*:** A self-administered Arabic version questionnaire was adapted based on the WHO Guidelines on hand hygiene in a health care setting (WHO, 2009) which includes scales to assess attitudes, barriers to performing hand hygiene, and sociodemographic (age, gender, year of experience, educational level, and a question if participants have had formal training toward hand hygiene).

The section regarding attitude contains 11-items each item is measured on a 5-point Likert scale as (*Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly Disagree = 1*). The score ranges from 11- 55. Participants with a positive attitude were those with correctly answered ≥50% of the attitude questions about the WHO guidelines while a negative attitude for those who responded <50% correctly to the attitude questions about the WHO guidelines. To identify barriers, 16-items representing hand hygiene barriers were included based on the WHO Guidelines. The items were rated as "Yes=1" or "No=0" options (16 items) ranging from 0-to 16.

The structured questionnaire was written in English and translated into Arabic using Briline's back-translation approach. Then, a panel of 22 confirmed the content validity of the questionnaire. Regarding the reliability, a test and re-tests approach was done by evaluating 20 nurses that work in the intensive care unit designated for patients with coronavirus disease in Marjan Teaching Hospital. The result showed that Cronbach's Alpha was (0.89 for the attitudes domain and r = 0.87 for the barriers domain) which is considered acceptable (Barton & Peat, 2014).

Data Analysis: The data was entered into the IBM-Statistical Package for the Social Sciences (SPSS) version 21 software program and analyzed using descriptive and inferential statistics. Analysis of Variance (ANOVA) was used to measure the difference between variables. Chi-square test, Fisher persons, and Superman analysis were used for independent samples to determine whether barriers and attitudes are related and to quantify the relationship between them.

Ethical Considerations: To conduct the study, the first step was to get the IRB approved which was done by the College of Nursing at the University of Baghdad. On the other hand, participants were ensured that the provided information will be confidential and for scientific research purposes only. Also, nurses' participations were voluntary, and they have the right to withdraw at any moment without any consequences.

Result

As the results in Table 1 show, the mean participants' age was 29.2 years with an SD of 0.82, and more than half of them were male (56.2 %). The mean of nurses' years of experience was 6.7 years with an SD of 0.381. Regarding their educational level, 40.8% had a bachelor's degree in nursing. Furthermore, the majority (90%) of nurses in this study have not been trained in hand hygiene performance.

Table 1
Distribution of Participants According to their Demographic Characteristics

Demographic Characteristics		Sample analysis	
		f.	%
Age Mean ± SD 29.2 ± 0.821			
Gender	Male	73	56.2
	Female	57	43.8
Years of experience Mean ± SD 6.7 ± 0.381			
Level of education	Nursing school graduate	24	18.5
	Diploma	46	35.4
	Bachelor's degree	53	40.8
	Master's or Ph.D.	7	5.4
Training for hand hygiene performance	No training	117	90.0
	Training	13	10.0

f. = Number of frequencies, %=Percentages.

Regarding the overall score of nurses' attitude level toward hand hygiene practice, it was a negative attitude with Mean ± SD (2.85 ± 1.10). Table 2 shows that the majority of the attitude level for hand hygiene practice was a negative attitude (73.1%) among ICUs nurses and only positive attitudes in item number seven with Mean ± SD (4.10±0.97) and item number eleven with Mean ± SD (4.30 ± 0.832). Also, the high percentage of negative attitudes was in item number three with Mean ± SD (2.00 ± 1.010).

Table (2):
Nurses' Attitudes regarding Hand Hygiene Practice

N.	Items	Means	SD	Result
1	The necessary commitment to practice proper hand hygiene at all times	2.88	1.207	N
2	Adequate knowledge about hand hygiene practices is essential to improving health	2.91	1.103	N
3	Sometimes I have more important things to do than practice hand hygiene	2.00	1.010	N
4	Emergencies and other priorities sometimes make practicing hand hygiene more difficult	2.59	1.002	N
5	Wearing gloves reduces the need to clean hands	2.02	1.236	N
6	I feel frustrated when others ignore the process of hand	2.69	0.99	N

	hygiene			
7	All nurses should practice proper hand hygiene	4.10	0.97	P
8	Newly qualified personnel have not been properly trained in hand hygiene practices	2.69	1.01	N
9	I feel guilty if I neglect the process of cleaning my hands	2.57	0.95	N
10	Committing to the practice of hand hygiene is easy nowadays	2.60	1.00	N
11	Critical health care workers in the field should be role models for others in washing and hand hygiene.	4.30	0.83	P

*f. =Frequencies, %=Percentages, M.s = Means, SD = Stander deviation. Interval: *Positive Attitude ≥ 50 for correct answer, Negative Attitude ≤ 50 for correct answer.*

Table 3
Barriers to Hand Hygiene Practice among Nurses at intensive care units

N.	Items	Frequency	Percentage (%)
16	The overburdened inpatient care is not allowed in the practice of handwashing.	121	93.1
5	Hand washing may cause skin irritation and damage	111	85.4
13	infrastructural deficit (e.g., lack of water, soap, and hand sanitizers)	118	90.8
12	insufficient time prevents me from practicing hand washing	99	76.2
4	Work uniforms for patients with COVID 19 prevent me from practicing hand hygiene	49	37.6
6	The place for handwashing in the hall is not suitable	45	34.6
9	Not thinking about hand hygiene or forgetting to wash them	40	30.7
15	No educational model for handwashing in the hallway/No update with a new version	39	30
8	the process of washing hands is not necessary in case of touch only	36	27.6
3	Hand washing prevents effective care of patients from continuing	33	25.3
10	do not promote a work environment in the institution to clean hands	31	23.8
11	My hands hurt or have wounds that prevent me from washing them	27	20.7
2	Hand washing does not affect the clinical outcome of the patient	24	18.4
14	Hand washing takes a long time I doubt the real value of handwashing	24	18.4
1	The process of washing hands between the patient and the other patient is not necessary	23	17.6
7	Hand washing takes a long time	18	13.8

f. =Frequencies, %=Percentages

In Table 3, the results show the barriers that reduce hand hygiene performance among nursing staff in intensive care units. Nurses consider four items ("The overburden of inpatient care is not allowed in the practice of handwashing", "*Handwashing may cause skin irritation and damage*", "*infrastructural deficit*", and "*insufficient time prevents me from practicing handwashing*") as top barriers that reduce hand hygiene performance. Regarding the relationship between nurses' attitudes and barriers to performing hand hygiene, the results show that the correlation is statistically significant at a P value<0.05.

Table (4):
Relationships between Participants' Demographics and their Attitudes or Barriers to Hand Hygiene

	Attitudes		Barriers	
	p. value	Analysis	p. value	Analysis
Age	.652	Cc = .375	.296	Cc = .211
Gender	.060	F = .361	.402	F = .055
Years of experience	.093	Cc = .457	.148	Cc = .287
Level of education	.002	F = .31	*.005*	F = .41
Training	.008	F = .304	.000	F = .611

P=probability value, NS: S: Significant at P < 0.05, HS: high significant at P<0.01

In Table 4, the results show that there is no statistically significant correlation between barriers and attitudes concerning nurses' age and years of experience at the p-value of 0.652 and 0.296, respectively. Also, nurses' attitudes and the barriers to hand hygiene were not different among male and female nurses at the p-value of 0.6 and 0.402, respectively. On the other hand, nurses' attitudes and the barriers to hand hygiene were significantly different among nurses' educational levels at a p-value of 0.002 and 0.005, respectively. Also, nurses' attitudes and the barriers to hand hygiene were significantly different between nurses who took training courses and who do not at the p-value of 0.008 and 0.000, respectively.

Discussion

The findings of the study indicated that 40.8% of the nurses had bachelor's degrees in nursing. In Iraq, nurses can be registered by graduating from high school in nursing, two years of studying after high school (nursing institutes), or having Bachelor's and higher degrees in nursing. Rajih, (2020) stated that 64% of the participants were graduated from the college of nursing. Regarding participants' years of experience, the mean was 6.7 years which was compatible with Al Ghafari and AbuRuz (2019) and the mean was 6.24 years.

Concerning participation in training courses, only 10% of the nurses entered training courses about hand hygiene techniques. This can be due to the lack of courses in continuing education (Rajih, 2020). Rajih (2020) also found that none of the Iraqi nurses have taken any training courses about hand hygiene. The findings indicated that most of the study sample had negative attitude levels (73.1%). The lack of training courses about hand hygiene can be the main reason (Rajah, 2020). This was not only in Iraq as Chauhan et al. (2020) mentioned that 71.3 % of nurses had a negative attitude toward hand hygiene.

Item number three "*Sometimes I have more important things to do than practice hand hygiene*" was the item with the highest negative attitude among the nurses in this study .Indeed, this can be due to nurses' focus on their patients' needs rather than hand hygiene practice. This is consistent with other studies (Al Ghafari & AbuRuz, 2019; Yousif et al., 2020).

Participants in this study highlighted "*heavy workload*", "*skin irritation*", "*infrastructural deficit*", and "*insufficient time*" as the main barriers that prevent nurses to perform hand hygiene. The heavy workload was the major barrier in this study, many studies (Al Ghafari & AbuRuz, 2019; Ataiyero et al., 2019; Derksen et al., 2020; Kumar Yadav et al., 2020) confirmed that too. One of the main reasons can be the nursing shortage in hospitals.

Regarding the correlation between nurses' attitudes and the barriers toward hand hygiene, there was a significant correlation at a p-value of 0.000. This result is similar to (Goodarzi et al., 2020). Indeed, this was a surprise for the researchers as a negative attitude can be a barrier itself to performing hand hygiene (White et al., 2015).

No statistical correlation was shown between participants' age or years of experience with nurses' attitudes and neither of them the barriers toward hand hygiene. Goodarzi et al. (2020) found no relationship between nurses' age and years of experience concerning their attitude. Also, Assefa et al. (2021) found no relationship between age and barriers. However, other studies (Quiros et al., 2007; Zakaria & Sofiana, 2018) stated that age and years of experience increase nurses' attitude toward positivity.

The findings in this study presented that male and female nurses did not significantly differ concerning their attitudes or the barriers that prevent hand hygiene performance. This can be related to the contingency of the study sample regarding their work environment and opportunities to participate in continuous education to take courses about hand hygiene. In a study done by Alfahan, et al., (2016), the results showed that attitudes and levels of practicing hand hygiene did not differ among nurses' gender.

Nurses with different educational levels scored differently on attitudes and barriers and that was statistically approved. Similar results were found by Ethiopia (2017) and Kumar Yadav et al. (2020). This was expected for researchers as nurses with high educational levels learn more about hand hygiene in their curricula. Regarding training courses, the results showed that nurses' attitudes and barriers to hand hygiene differed between nurses who took training courses

and who do not. Many studies proved that educational training improves hand hygiene practices among nurses (Al Ghafari & AbuRuz, 2019; Bakey, 2016; Chauhan et al., 2020; Nuwagaba et al., 2021)

Conclusion

Nurses' attitude toward hand hygiene is significantly associated with the barriers that prevent nurses to perform hand hygiene. Negative attitudes and barriers can harm nursing hand hygiene which may lead to an increase the infectious diseases in hospitals. Also, this study revealed that focusing on hand hygiene training courses within continuous education in hospitals can make nurses' attitudes more positive toward hand hygiene

Limitations

Since this is a cross-sectional study, the results reflect a single point in time, which might give different results if another timeframe was used. Another limitation was assessing only the barriers and attitudes on practicing hand hygiene, which the actual practice of handwashing was not observed in the study sample.

Recommendations

There is a need for optimizing hand hygiene practices by addressing the barriers, conducting continuous training programs, and providing the supplies necessary for hand hygiene to improve the attitude toward compliance with hand hygiene guidelines. As also, observational studies are needed to investigate the practices of nursing staff toward hand hygiene.

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