

Determinants of Nurses' Non-Compliance to Hand Hygiene Practices During the COVID-19 Pandemic

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Abstract:

Background: During the COVID-19 pandemic, poor hand hygiene compliance was observed among nurses, in spite of the fact that keeping hands clean is a simple, affordable method that reduces the risk of spreading health care-associated infections. The aim of the study was to investigate the determinants of nurses' non-compliance with hand hygiene practices during the COVID-19 pandemic. A descriptive exploratory design was utilized to fulfil the aim of the study. A convenient sample of all adult nurses who worked in the four randomly selected medical and surgical wards at a big teaching hospital affiliated with Cairo University Hospitals, Egypt. The following tools were utilized to collect study data: (a) Demographic and Background Information Form; (b) Hand Hygiene Practice Direct Observation Form; and (c) Determinants of Nurses' Non-Compliance with Hand Hygiene Practices Questionnaire.

Results: As regards non-compliance rates, 69.2% of the study sample were not performing the opportunities, which were the five moments of hand hygiene. while 30.8 percent of them had performance concerns. In relation to the determinants of non-compliance with hand hygiene practices; 46.2% of the study sample complained of having a heavy workload and a lack of time; 41.5% of them had to take prompt actions and many procedures they had to do; and 40% of the study sample preferred to meet patients' needs rather than wash their hands. **Conclusion:** Regarding the studied nurses' non-compliance, more than two thirds of them were not performing the opportunities which were the five moments of hand hygiene. The most significant determinants of nurses' non-compliance with hand hygiene practices were their workload, lack of time, prompt actions, and many procedures they had to do.

Recommendations: With the intention of turning knowledge into action, shifting attitudes into constructive behavior, and promoting proper hand washing procedures, ongoing monitoring and evaluation should be implemented.

Key words: determinants, nurses' non-compliance, hand hygiene practices, COVID-19 pandemic.

Introduction:

Healthcare-associated infections (HAIs) account for about 25 infections in every 100 patient admissions in both developed and developing countries. Infections remain the world's top contributor of morbidity and deaths. They constitute a significant financial and social burden on patients, families, and communities. One of these infections is coronavirus disease 2019 (COVID-19). It is an infectious respiratory disorder brought on by the SARS-CoV2 coronavirus, which has just been discovered (Zhu et al., 2019; World Health Organization, 2020).

The prevention and management of hospital infections, including the Corona virus infection, are currently handled in a variety of ways, including cleaning, disinfection, sterilization, asepsis, hand hygiene (HH), surveillance, patient isolation, and epidemiological methods. Yet, as HH prevents agent cross-contamination, thorough hand washing (HW) is a relatively simple, inexpensive, and effective technique for the prevention of Corona virus infection (Rianita & Suryani, 2019).

In addition to removing obvious filth from the hands, HW also reduces the amount of resident flora by removing stray plants. All research done on this subject revealed that

healthcare workers' commitment to HH is insufficient, despite the fact that it should be done regularly by all healthcare practitioners (Teker et al., 2015; Sadeghi et al., 2018; Engdaw, et al., 2019).

This confirms that HW is the single most crucial step in the prevention of infection, according to the norms established by national and international organizations. Despite receiving all the necessary information and training, it was found that over the previous 30 years, more than half of healthcare professionals disregarded the advice on proper HH. Even if the methodology, research groups, and departments under investigation varied, HH compliance is acknowledged to be generally low (Teker et al., 2015).

In this context, previous studies' findings revealed that factors influencing nurses' compliance with HH included skin irritability, a lack of hygiene products, patients' negative perceptions of nurses wearing gloves, forgetfulness and disregard for instructions, a lack of time due to a high workload and a staffing shortage, and a lack of scientific evidence that HH reduces hospital infections (Sadeghi et al. 2018).

Additionally, the findings of an Ethiopian investigation showed that there was generally low compliance with HH among medical professionals. Hand hygiene compliance (HHC) was strongly influenced by education, access to sufficient soap and water, the presence of alcohol-based hand rub, awareness of proper HH, and the attitude of healthcare professionals (HCPs) (Engdaw et al. 2019). Evidence also reveals that personal and organizational characteristics, as well as religion and culture, affect how healthcare workers practice HH (Sadeghi et al. 2018).

In order to address this health issue on both the preventive and therapeutic sides, nurses must play a vital role. In response to infectious disease pandemics and epidemics, nurses have a crucial role in healthcare, according to a new systematic review (Fernandez et al., 2020). The culture, attitude, understanding, as well as the human and organizational components of

caring for patients with COVID-19, demand further education and training (Sun et al., 2020; Rathnayake et al., 2021). Therefore, this study aimed to investigate the determinants of nurses' non-compliance with HH practices during the COVID-19 pandemic at randomly selected medical and surgical departments.

Significance of the study:

Prior research has demonstrated that nurses will forego their own demands amid sudden natural disasters and infectious diseases in order to actively contribute to the anti-epidemic work and make unselfish contributions out of moral and professional obligation. Nurses work closely with patients who have newly emerging infectious disorders like COVID-19. The fight against COVID-19 by strengthening nurses' capacity to use basic precautions is considered one of the most efficient ways to stop the spread of germs in hospitals. The implementation of common precautions can be accomplished by practicing good HH. Maintaining good HH and providing feedback are two of the most crucial steps in reducing the spread of COVID-19 infections (Aliakbari et al., 2015; Khalid et al., 2016; Kim, 2018; Sun et al., 2020).

Different nurses from around the world adhere to hand cleanliness to various degrees. The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have compliance standards for HH implementation of 75%, but the average percentage of nurse compliance in the application of HH in the fourth quarter of 2017 was 55%, indicating that the compliance of HH nurses still had not reached that standard. The willingness of nurses to practice HH is still very low, and nurses' motivation to practice HH is still low, despite institutional HH policies and protocols. Additionally, nurses were already familiar with the WHO's 5-moments and 6-step HH procedures and could apply them well (Rianita & Suryani, 2019).

In a multicenter study on HHC with 60,055 observations, nurses had a rate of adherence of 55.8%, doctors had 52.8%, intrusive contact had 53.9%, and surface contact

had 50%. Another study conducted in the United States found that only 30% of doctors and nurses washed their hands before coming into contact with patients and that between 15 and 45 percent washed their hands afterward (Sakihama et al., 2014). Monitoring the causes of non-adherence in healthcare facilities, carrying out interdisciplinary, long-term, successful campaigns, and developing solutions that should be backed by hospital administration are all crucial for improving the adherence of nurses to HH (Rianita & Suryani, 2019). Therefore, the present study aimed to investigate the determinants of nurses' non-compliance with hand hygiene practices during the COVID-19 pandemic.

Aim of the study

The aim of the current study was to investigate the determinants of nurses' non-compliance with hand hygiene practices during the COVID-19 pandemic.

Method

Research questions:

1- What is the rate of compliance with hand hygiene practices during the COVID-19 pandemic?

2- What are the determinants of nurses' non-compliance with hand hygiene practices during the COVID-19 pandemic?

Design

The current study used a descriptive exploratory research strategy to accomplish its aim. The least control over variables is offered by exploratory-descriptive designs, which are typically outdoor studies conducted in undeveloped areas. The information gathered either advances theory or explains phenomena from the viewpoint of the people being examined (Grey et al., 2017).

Setting

The study was conducted in four randomly selected medical and surgical wards (two medical and two surgical wards) at Egypt's

largest teaching hospital, which is affiliated to Cairo University.

Sample

All adult nurses in the four medical and surgical wards who were randomly chosen, had direct patient contact, consented to the study, and had at least six months of work experience in these wards made up the convenient sample. Nurses were assessed regarding their compliance or non-compliance with HH practices (compliance rate) utilizing the Direct Observation Form, a standardized tool developed according to WHO guidelines in 2009.

Tools:

The following tools were used to gather information pertinent to the current study:

1: Demographic and Background Information Form: It was developed by researchers and included two parts: (a) Demographic characteristics that covered information about nurses' characteristics such as age, gender, and marital status (b) Background data covering information such as years of experience and hand hygiene training.

2: Hand Hygiene Practice Direct Observation Form: It is a standardized tool developed in accordance with WHO guidelines in 2009. It contained three vertical columns; the first column included the frequency, or number of patients, assigned to each selected nurse. The second vertical column included the five opportunities, while the last column included the actions utilizing three choices, hand rub (HR), hand washing (HW), and finally missed action (MA). The opportunities (opps) that have been reported were totaled in the form together with the positive HH behaviors connected to the total of opportunities above, distinguishing between HW and HR. Report the total in the computation form's corresponding cell. The established calculation formula calculated by dividing the number of correct actions by the number of opportunities in percentage. The compliance rate calculated, and the accepted rate was 80%. Less than 80 percent was

considered non-compliance according to a national benchmark set by the Australian Health Ministers' Advisory Council (2021), and the rate was recorded utilizing the following three colors: Green (performing): $\geq 80\%$, Amber (performance concern): $<80-78\%$ and finally Red (not performing): $<78\%$.

3-Determinants of Nurses' Non-Compliance with Hand Hygiene Practices Questionnaire: This questionnaire was developed by researchers after an extensive review of the literature and previous research studies. It aimed to investigate the determinants of nurses' non-compliance with HH practices during the COVID-19 pandemic (Teker et al., 2015; Sadeghi et al., 2018; and Zeb et al., 2019). This questionnaire classified into personal determinants (13 items) and organizational determinants (15 items). The scoring system was based on the nurses' responses as follows: (1) if yes, and (0) if no.

Validity and reliability:

Three professors expert in the field of medical-surgical nursing specialty examined the content validity of the existing research instruments, and the researchers used test-retest reliability to determine the tool's dependability. Cronbach's alpha test was utilized to assess internal consistency and construct validity with a value of 0.82.

Ethical considerations

The directors of the medical and surgical wards, as well as the research ethical committee, all formally approved the research project before it was carried out. After explaining the nature, goal, and importance of the research, nurses were asked for their written consent. Each nurse had the option to participate or not in the current study and the freedom to leave the study at any time and without explanation. The study was completely voluntary, the researchers noted, and the data were coded to ensure anonymity and confidentiality.

Pilot study:

More than 10% of the nurses (no=11) participated in a pilot study to assess the study instruments' applicability, clarity, reliability, and feasibility, as well as to determine how long it would take to complete. Thus, the necessary adjustments were made. Depending on the necessary modifications, the study excluded the pilot sample from the research.

Procedure:

After receiving official approval to move forward with the proposed study, the researchers interviewed each possible nurse they approached separately for the study. The study's scope, methodology, and significance were all made very clear. All nurses worked in both morning and afternoon shifts were enrolled in the study. A single researcher collected all HH data. The researcher completed the Demographic and Background Information Form during the interview and after signing the consent form (tool I). Filling this form took about five minutes for each nurse by the researcher. These nurses were responsible for providing care for more than one patient, and they were observed once while providing care for the assigned patients for a period of eight hours (shift duration) according to their hospital duty schedule. They were assessed regarding their compliance rate with HH practices utilizing Tool II. Nurses who were not complying with HH practices (less than 80% compliance rate) were approached from the randomly selected medical and surgical wards. Compliance rate was calculated based on a specific formula, which considered the number of actions or opportunities divided by 100. Often, the word "opportunity used to describe the ideal time to wash hands. It meant the interval between the time hands become colonized after touching a surface (either the patient's surface or the environment) and the time they touched a receptor surface. This change may have an infectious consequence that is harmful. The five moments of standard precautions were opportunities (before touching a patient, before a procedure, after a procedure, after touching a patient, and after touching a patient's surroundings). Opportunities were

observed, and compliance was tested for all five moments as per WHO guidelines. The direct observation method, which still considered the gold standard, was utilized as it remained the most widely used and easily reproducible method for monitoring compliance. It provided both quantitative and qualitative data about compliance rate. Filling tool II took about fifteen minutes by the researcher, Selected nurses were then asked about the determinants of their non-compliance with HH practices utilizing tool III, which didn't take more than ten minutes to fill.

Statistical analysis:

The SPSS version 23 program was used to tabulate, compute, and analyze the data that had been collected. The data were analyzed using descriptive and inferential statistics; the descriptive statistics used were frequency, percentage distribution, mean, standard deviation, and correlation were applied. With a p-value of 0.05, statistical significance was taken into account.

Results:

As seen from Table 1, it is obvious that greater than half of the study sample were young, aged from 20 to less than 30, graduated from nursing institutes, and had more than five years of work experience, representing 52.3%, 56.9%, and 52.3%, respectively. Moreover, more than two-thirds of them were females, married, worked at medical wards in the morning shift, and were responsible for providing care to more than three patients,

representing 81.5%, 67.7%, 70.8%, 66.2%, and 86.2%, respectively.

Table 2 shows that the highest percentage of the study sample preferred to perform HR (41.5%) than HW (23.1%), and more than one third of them forgot to perform HH, representing 35.4%, respectively.

As seen from figure 1, it is obvious that the highest percentage of the study sample performed HH after patient contact, followed by touching the surroundings of the patient (44.6% and 43.1%, respectively). Equal percentages were observed before patient contact and before using aseptic technique, representing 32.3% respectively.

Table3 illustrates that 69.2% of the study sample was not performing the opportunities, which considered the five moments of HH. While, 30.8% of them had performance concerns.

It is obvious from Table 4, that 46.2% of the study sample complained of having a heavy workload and a lack of time, 41.5% of them had to take prompt actions, and there were many procedures followed by 40% of the study sample preferred to meet patients' needs rather than wash their hands.

Looking closely at Table 5, it is obvious that there were statistically significant correlation between gender, workplace, and compliance rate ($p = 0.045$ & 0.008). While no statistically significant differences were found between academic level, day shift, and compliance rate ($p = 0.816$ & 0.191),

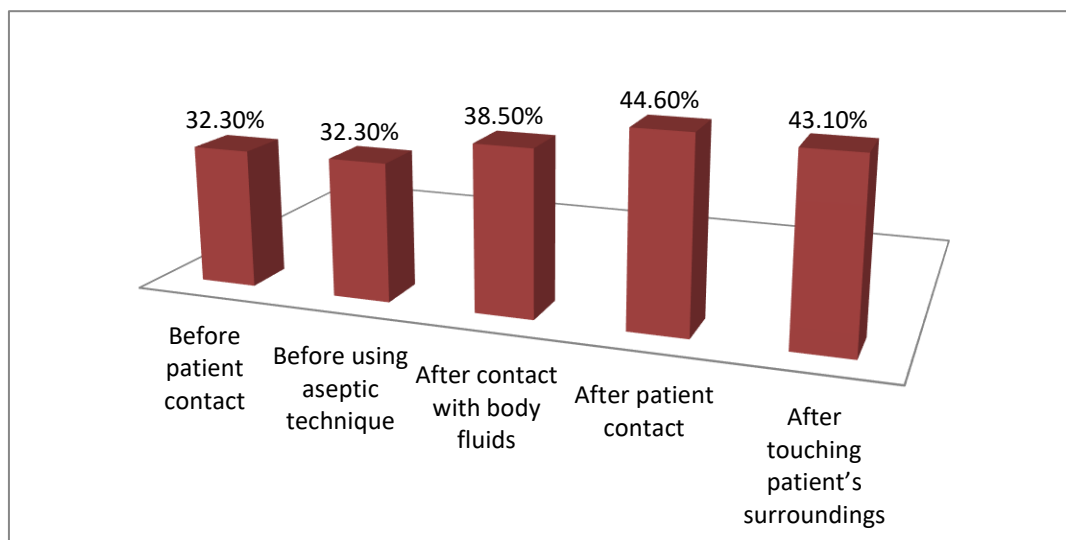
Table 1: Frequency and Percentage Distribution of Demographic Characteristics among the Study Sample (n = 65)

Variable	No	%
Age		
20- less than 30	34	52.3
30- less than 40	19	29.2
40- less than 50	9	13.9
50- 60	3	4.6
Mean +_SD	31.6 + 7.76	
Sex		
Male	12	18.5
Female	53	81.5
Marital Status		
Single	12	18.5
Married	44	67.7
Widow	4	6.2
Divorced	5	7.7
Academic Level		
Diploma	4	6.2
Nursing Institute	37	56.9
Bachelor Degree	24	36.9
Day Shift		
Morning	43	66.2
Afternoon	22	33.8
Work Place		
Medical Wards	46	70.8
Surgical Wards	19	29.2
Years of Experience		
Less than 5 Years	31	47.7
5 Years and above	34	52.3
Number of Patients Caring for		
Less than 3	9	13.8
3 and above	56	86.2

Table 2: Frequency and Percentage Distribution of Hand Hygiene Practise (Health Action) among the Study Sample (n = 65)

Health Action (Practice)	No	%
-Hand washing	15	23.1
-Hand rub	27	41.5
-Missed action	23	35.4

Figure 1: Percentage Distribution of Performed Opportunities (Five Moments) among the Study Sample (n = 65)



Opportunity: Situations that require hand hygiene *Variables are not mutually exclusive.

Table (3): Non-Compliance Rates among the Study Sample (total number of opportunities = 1430; n = 65)

Non-Compliance Rate	Number of Actions	%
-Not performing 78% (red color)	989	69.2
-Performance concern 78%–80% (Amber color)	441	30.8
Total number of opportunities	1430	100

Table 4: Frequency and Percentage Distribution of Determinants of Non-Compliance with Hand Hygiene Practices among the Study Sample (n = 65)

Determinant	No	%
*Hand washing solutions affect the integrity of skin.	6	24.6
*Prefer to meet patient needs rather than washing hands.	26	40.0
*Have workload and lack of time	30	46.2
*Prefer wearing gloves rather than washing hands.	8	12.3
The soap dispenser was too far away.	15	23.1
*Simultaneous care for many patients	18	27.7
* The requirement for quick decisions and multiple procedures	27	41.5
*The type of hand washing solutions used	16	24.6
*Inadequate number and placement of sinks in the wards	15	23.1
absence of infection control team supervision	1	1.5
Absence of educational programs (retraining) for staff	1	1.5
Unsatisfactory encouragement methods by the organization	2	3.1

* The variable is not mutually exclusive.

Table 5: R- Test regarding Compliance Rate and Selected Socio-demographic Characteristics (n = 65)

Variables	Compliance rate	
	R. test	p-value
Gender	0.831	0.045*
Academic level	0.665	0.816
Day shift	0.662	0.191
Work place	0.928	0.008**
-Insignificant $p > 0.5$	-Significant * $P \leq 0.05$	-Highly significant **

Discussion:

A cost-effective strategy to lower illnesses linked to healthcare is HH. Targeted HH intervention methods were supported by the overall features and changes in HHC among healthcare providers during the COVID-19 pandemic (Wang et al., 2021).

The current study findings showed that the highest percentage of nurses were females, and more than half of the study sample were young; their age ranged from 20 to less than 30, they were married, graduated from nursing institutes, worked at medical wards in the morning shift, and were responsible for providing care for more than three patients. This finding is congruent with an Iranian study conducted by Sadeghi, et al. (2018), which aimed to identify the elements influencing ICU nurses' compliance with HH in educational hospitals in Tabriz. Their study showed that the majority of nurses were young females, married, and had five years of working experience.

Concerning work experience, although the present study showed that more than half of nurses had more than five years of work experience, the HHC rate was low. This finding is disagreed with Asadollahi et al. (2015) and Bimerew and Muhawenimana (2022), who concluded that nurses with more than five years of work experience were more likely to comply with HH than nurses with less than five years of work experience. This may be because workers get more work experience, chances of receiving training, level of responsibility, and sense of belonging at work all rise. The evidence is more proof that nurses' awareness of proper handwashing techniques is influenced by their

educational background and professional experience.

It is worth mentioning that more than two thirds of nurses in this study worked in medical wards. In this context, Al Mohaithef (2020) mentioned that the workload may have contributed to the internal medicine department nurses' poor HH habits. In order to motivate nurses in the internal medicine department to observe and implement proper HH practices, frequent HH training sessions are required.

Concerning HH practice among the study sample, the findings of the study illustrated that the highest proportion of the study sample preferred to perform HR rather than HW, and more than one third of them forgot to perform HH. In this context, Engdaw et al. (2019) reported that HCPs compliance with HH significantly increased as a result of the accessibility of alcohol-based HR. This might be because an alcohol-based HR at the point of treatment reminds HCPs to practice good HH, which is simple to administer and the best strategy to increase HHC. One of the reasons why people couldn't wash their hands is that there aren't any services available in the ward where they work.

In relation to performed opportunities (WHO 5-moments) among the study sample, the highest percentage of the study sample performed HH after patient contact, followed by after touching the patient's surroundings and after contact with body fluid. While the lowest percentage (nearly a third of them) were observed performing HH before patient contact and before using aseptic technique,

The findings of the present study are consistent with a systematic review and meta-analysis of study findings conducted by **Wang et al. (2021)**, who reported that, according to the WHO 5-moments, it was discovered that healthcare workers had the highest HHC following contact with patients' bodily fluids, but they had the lowest HHC prior to such contact, which was consistent with before the pandemic. On the other hand, a recent study conducted by **Tadesse et al., (2022)** in Addis Abeba, Ethiopia, found that the proportions of "5 moments" of HH were 91.4%, 36.9%, 14.6%, 13.6%, and 17.2%, respectively, before patient contact, before an aseptic procedure, after body fluid contact, after patient contact, and after touching the patient's surroundings.

Although the majority of prior studies conducted globally showed that during the COVID-19 pandemic, health care providers' adherence to HH increased significantly compared to the scenario prior to the epidemic (**Makhni et al., 2021; Wang et al., 2021**). Interestingly, the current study's findings showed that less than 80% of the study population adhered to HH guidelines (the compliance rate was 78%). On the other hand, nearly one third of them had performance concerns (the compliance percentage was between 78 and 80%). This finding can be explained by the concurrent changes in HH opportunities, which may indicate that the fear and a greater understanding of the value of hand cleanliness brought on by the beginning of the epidemic were the driving forces behind the jump in compliance. High compliance did not last and dropped back to the norm. This study reveals that while high compliance is achievable, it is challenging to maintain as hospitals set HH standards. Hospitals now dealing with COVID-19 increases should take note of the recent reduction in compliance. These findings are congruent with a recent study conducted by **Tadesse et al., (2022)** entitled "Level of Hand Hygiene Compliance and Its Associated Factors Among Health Care Workers at Eka Kotebe General Hospital, Addis Ababa, Ethiopia," who found that HHC among healthcare workers was 22.2%. Also, **Makhni et al. (2021)** conducted a study entitled "Hand Hygiene Compliance Rate During the COVID-

19 Pandemic. From September 2019 through August 2020, they looked at the University of Chicago Medical Center's (UCMC) new adult hospital's HHC by day, week, and month. They came to the conclusion that compliance was still low, averaging 50% across all units, and that there was still room for improvement. Opportunities for practicing HH during the trial exhibited an adverse link with compliance.

The results of the current study, however, are in conflict with those of Wang et al. (2021), who discovered seven studies with 2,377 healthcare practitioners reporting HHC. The estimated total HHC was 74%, which was higher than the range of 5% to 89% reported in earlier research. The highest HHC was seen in nurses (80% & 95%). They also came to the conclusion that, throughout the COVID-19 pandemic, healthcare providers' compliance with HH standards had significantly improved.

The finding of the present study regarding HHC rate compared to the findings of previous studies might be due to the fact that there were different monitoring methods for HHC rate, which included automatic monitoring systems, open and secret observation, and a mixed secret and open observation method. The fact that this study was undertaken after the COVID-19 pandemic began in Egypt and that Elkasr Al Aini Hospital was one of the teaching hospitals may perhaps be the cause of these discrepancies. These factors, along with health professionals' improved attention to training in donning and doffing techniques, may lead to an increase in the practice of hand cleanliness. The WHO multimodal HHC intervention technique, various study sites, and various study designs could potentially be to blame.

In relation to the determinants of nurses' non-compliance with HH practices; about one-half of the study sample complained of having a heavy workload and a lack of time, followed by the fact that they had to take prompt actions and there were many procedures they had to do, and they preferred to meet patient needs rather than wash their hands.

Hospitals improved intervention strategies for the HHC among HCPs based on

their first-hand experience during the COVID-19 outbreak, including enhancing education, increasing monitoring frequency, putting up alerts and warning signs, and other measures (**Bani-Issa et al., 2021; Huang et al., 2021**). In addition, it's possible that during the COVID-19 contingency state, HCPs were more self-aware of and capable of performing HH than under other regular working settings. The extent to which HH behavior and compliance among HCPs changed and the potential nature of such changes during the outbreak are unknown (**Modi et al., 2020**).

The current study findings are in line with those of earlier studies by **Mu et al. (2016)**, **Sadule-Rios and Aguilera (2017)**, **Santosningsih et al. (2017)**, **Ataiyero et al., (2019)**, and **Sands and Aunger (2020)**, who found that a variety of determinants, including heavy workloads, interruptions from other activities, forgetting to wash one's hands, a lack of HH facilities, resistance to the hand skin disinfectant brought on by frequent HH, low staff-to-patient ratios, low staff comprehension of procedures, the time needed, and casual attitudes among healthcare personnel towards biosafety, contributed to the compliance rate. In addition, **Tadesse et al. (2022)** came to the conclusion that HH training, the existence of a poster with HH instructions, the work experience of HCPs, and having a vocation as a midwife or nurse were independent predictors of HHC.

According to **Zhang et al., (2019)** observational study in Beijing, China, a high nursing workload was a significant contributing factor to poor HH adherence.

The findings of the present study showed that there were statistically significant differences between gender, workplace, and compliance rate with regard to a link between compliance rate and specific demographic factors. This result showed that gender was a significant factor in determining compliance with HH. In general, past studies had shown that women washed their hands more frequently than men did, and female nurses reported washing their hands more frequently than male nurses. Moreover, it appeared that gender may

influence HW rates in health care settings (**Cruz et al., 2015; AL Mohaithef, 2020; Bimerew & Muhawenimana, 2022**).

There was a connection between HH compliance and the workplace, which can be explained by the fact that as job experience increases, so does the likelihood of receiving training, the level of responsibility, and the sense of belonging to their workplace. If the data were to be strengthened, it would show that nurses' awareness of proper HW techniques influenced by their job experience (**Bimerew & Muhawenimana, 2022**). However, no statistically significant correlation between academic standing and compliance rate was discovered. This result is consistent with the findings of the study carried out by **Bimerew and Muhawenimana (2022)**, who found that education level had a bearing on knowledge of HW but less on attitudes and behaviors. The current investigation revealed that there was no statistically significant difference between day shift and compliance rate with regard to HHC. The study conducted by **AINakhli et al. (2014)**, who sought to assess the baseline HH non-compliance rate and identify the factors related to non-compliance in a cardiac center in Saudi Arabia, was in direct opposition to this finding. Which revealed that, compared to evening shifts, morning shifts were strongly related to non-compliance. What are the predictors of HHC in the intensive care unit? is a recent study carried out by **Madden et al. (2021)**. It revealed that, during night shifts rather than morning shifts, HH was more frequently practiced, according to a cross-sectional observational study.

Conclusion:

Results of the present study revealed that more than two thirds of the study sample was not performing the opportunities, which considered the five moments of HH. While, one third of them had performance concerns. The most important determinants of nurses' non-compliance with HH practices were their workload and lack of time. Nurses took prompt actions because of the presence of many procedures they had to do. Moreover, they

preferred to meet patient needs rather than wash hands.

Recommendations:

- HH instruction for nurses is required, and the hospital must establish and consistently supply HH facilities.

- In order to prevent diseases connected with healthcare, health practitioners must follow the WHO's five moments for proper HH. As well as continuous follow-up and training for HCPs, installing HW facilities and providing soap and alcohol-based HR next to each working unit are important.

- Extensive teaching programs and behavioral modification techniques should be encouraged for all HCPs and employees especially nurses, with an emphasis on conducting HH during all symptoms rather than just the "after" indications.

- To raise awareness of the value of HH, posters and other visual aids demonstrating its significance should be put on display in all departments. They could provide a simple, affordable strategy to promote use of alcohol-based HR, and influence behaviors related to public health.

-With the intention of turning knowledge into action, shifting attitudes into constructive behavior, promoting and maintaining proper HW procedures, continuous monitoring and evaluation should be implemented. For infection prevention and control in a hospital, it is essential to uphold standards for knowledge and attitudes, as well as constant correct HW techniques throughout the career of nursing.

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