

HAND HYGIENE: KNOWLEDGE AND PRACTICE BY HEALTH CARE WORKERS IN A TERTIARY HEALTH CARE FACILITY IN SOUTH EAST NIGERIA

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ABSTRACT

BACKGROUND: The prevalence of health care associated infections can be reduced by hand hygiene (HH). This study is aimed at determining the knowledge and practice of HH among healthcare workers (HCWs).

METHOD: descriptive cross-sectional study using semi-structured questionnaire among HCWs selected by cluster sampling was carried out at University of Nigeria Teaching Hospital Ituku-Ozalla, Enugu.

RESULTS: Respondents were 629, mostly females (64.4%), married (62.3% and aged between 19 and 59 years. About 63% received training on HH. Average knowledge score was 80.3%. All respondents knew about the following moments of HH: before exiting patient's care area and after contact with body fluids. However, 45.6% and 54.2% knew that HH was indicated before touching a patient and after removing hand gloves respectively. Only 12.2% of respondents washed hands before patients. All doctors and nurses washed hands before aseptic procedures. Regular access to HH resources were 17.6%, 7%, 5.5%, and 1.7% among medical laboratory scientists (MLS), doctors, nurses, and health attendants respectively.

CONCLUSION: knowledge of HH was generally high but practice was poor for some moments of HH like before wearing gloves and leaving patients' care area. Unavailability of HH resources was implicated.

Keywords: Hand hygiene, knowledge, practice, healthcare workers

Running Title: Healthcare workers and hand hygiene

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INTRODUCTION

The hands of health care workers (HCWs) have been implicated as the cause of the increasing

prevalence of health care associated infections(HAIs).¹ Increasing attention is being drawn to HAIs because there is evidence that most of them can be prevented. It has been documented that

HAI's affect as many as one in twenty five hospitalized patients.² Nigeria has been reported to be one of the countries with a high burden of HAI's.³ The prevalence of HAI's can be reduced significantly by proper hand hygiene (HH) which has been said to be the single most important and least expensive means of reducing these infections and controlling the spread of antimicrobial resistance.^{4,5} This is because strict adherence to hand hygiene practices can significantly reduce the rates of acquisition of pathogens on hands and ultimately reduce the rates of transmission of HAI's in the hospital.⁶

It is partly in recognition of this relevance that the World Health Organization (WHO) in 2004, approved the creation of an "Alliance for Patient Safety", which acknowledged the universal need to improve HH in healthcare institutions and developed a strategy with a very clear call to action: "Clean hands are safer hands." WHO's five moments of hand hygiene is the gold standard for compliance.⁷ These globally approved recommendations reinforce the need for multidisciplinary interventions, including important elements such as education and motivation of healthcare workers, the inclusion of alcohol-based solutions, the use of compliance indicators and a strong commitment by all healthcare managers.⁸

Despite its relative simplicity, HH compliance rates vary and may still be poor.⁷ HH rates in an Indian hospital revealed 78% overall compliance among health care workers.⁸ However, a study in Ethiopia revealed only 16.5% compliance.⁹ Compliance was significantly associated with knowledge of hand hygiene, getting training and

availability of materials and facilities for the practice of HH.⁹ Studies in Nigeria have shown consistently low compliance with hand hygiene.¹⁰ Direct observation of some Nigerian doctors in a tertiary health institution revealed HH compliance rate of only 16.7%.¹¹

According to studies, compliance rates with HH seem to be less before contact with patients than after patients' contact.^{12,13} This very worrisome observation implies that HCWs may be oblivious of the fact that their hands constitute a huge medium for the transmission of pathogens.

Most common barriers to hand hygiene practices include: unavailability of materials for HH such as water, soap/detergents and alcohol-based agents, forgetfulness, too busy/insufficient time and inconvenient location of sinks.^{10,11} This thus buttresses the point that all hands must be on deck to actualize good HH practices in the health industry. The health managers should create enabling environment by regularly providing HH materials in convenient locations and ensure that the health care workers are trained on their use. On the other hand, the HCWs should comply with HH practices as outlined by the WHO.

Studies indicate that compliance with HH vary with the different professional groups in the health care system. Hand hygiene practices were found to be consistently better among nurses than doctors for no obvious reasons.¹⁴⁻¹⁷ The present study is aimed at determining the knowledge and practice of HH among HCWs of a tertiary health institution in south east Nigeria. It is also hoped that findings will be of value in promoting HH among all health workers in

Nigeria and hence reduce the incidence of nosocomial infections.

METHODS

This descriptive cross-sectional study was done among HCWs at University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu. The HCWs studied included: Doctors, Nurses, Laboratory scientists and Hospital attendants/Orderlies. UNTH is located in Ituku and Ozalla which are semi-urban communities about 30 minutes - drive from the state capital. The hospital started as a general hospital in 1960 at the old site (Enugu-North LGA) but was moved to the present location (Ituku-Ozalla) in 2007. It is the biggest teaching hospital in the South east and South-south regions of Nigeria and gets referrals from most parts of these two regions. The staff strength is about 5,000. The departments studied were Intensive Care Unit (ICU), Theatre, Wards, Laboratories, Casualty, Out-patient Departments and Blood bank.

Sample Size estimation: A minimum sample size of 382 was calculated using the formular for prevalence studies.¹⁸ The prevalence (p) used for calculation was obtained from a previous study of hand hygiene of 46% among HCWs.¹⁹

Data Collection: Cluster sampling was used for sample selection where the above departments/units served as clusters. There are 7 major departments/units as indicated above. Proportionate method was used to select the number of sub-departments/sub-units from each the major department/units. All the staff in selected sub-departments/sub-units were invited to be part of the study. A pre-tested self-administered questionnaire was used to

collect data from respondents. Contents of the questionnaire include demographical variables, knowledge and practice of hand hygiene among HCWs.

Ethical Permit: The Ethics Committee of University of Nigeria, Nsukka granted ethical clearance and informed consent was obtained from the management and staff of University of Nigeria Teaching Hospital.

Data Analysis: Data was entered and analyzed in Statistical Package for Social sciences (SPSS) version 17.

Scoring of Knowledge questions: each correct answer was scored = 1 while each wrong answer or non-response was scored = 0. The percentage score was obtained by the total correct answer divided by the total possible correct answer multiplied by 100%. Scores of < 50% was regarded as poor knowledge; between 50% and less than 70% was fair knowledge while 70% and above was considered as good knowledge.

RESULTS

A total of 629 HCWs were interviewed, this consisted of Doctors (22.7%), Nurses(46.2%), Medical Laboratory Scientists(21.6%) and Health Attendants (9.5%). Males constituted 35.6%, the age range was 19 to 59 years and they had between 1 and 34 years work experience. Most of the respondents (62.3%) were married while 29.8% were single (Table 1).

Table 1: Demographic variables of the respondents

Demographic variable	Frequency (n = 629)	Percentage
Sex		
• Male	224	35.6
	405	64.4

• Female		
Age Range (years)		
• 19 – 28	122	19.4
• 29 – 38	251	39.9
• 39 – 48	168	26.7
• 49 – 58	85	13.5
• 59 – 68	3	0.5
Marital Status		
• Married	392	62.3
• Single	187	29.8
• Widow	39	6.2
• Divorced/Separated	11	1.7
Occupation		
• Doctor	143	22.7
• Nurse	290	46.2
• Lab Scientist	136	21.6
• Health Attendant/ Orderly	60	9.5
Years of Present Work		
• 1 – 9	394	62.6
• 10 – 19	152	24.2
• 20 – 29	70	11.1
• 30 – 39	13	2.1

Age Range: 19 – 59 years

Years of work: 1 – 34 years

As many as 391(62.2%) received formal training on infection control and all the health workers (100%) agreed that hand washing was part of infection control. The overall knowledge on hand hygiene was good (80.3%). Adequate knowledge of hand washing indications was found for these moments: Before exiting patient's care area (100%), After contact with blood, body fluids or excreta(100%)and Prior to performing any aseptic procedure(100%). However, only 287(45.6%) and 341(54.2%) knew that hand washing was indicated before touching a patient and after removing hand gloves respectively (Table 2).

Table 2: Training on Infection Control and Knowledge of indications for hand washing

Variables	Frequency	Percentage
	(n = 629)	

	Yes	
Received Formal Training on Infection Control	391	62.2
Knowledge on Hand washing		
Is hand washing part of infection control	629	100.0
When hand washing is indicated		
• Before touching a patient	287	45.6
• Before exiting patient's care area	629	100.0
• After contact with blood, body fluids or excreta	629	100.0
• Prior to performing any aseptic procedure	629	100.0
• After removing hand gloves	341	54.2

Knowledge Score = Total knowledge score divided by the total possible scores multiplied by 100 = $3535/4403 = 80.3\%$ (Good Knowledge)

Concerning practice of hand hygiene, only 85 (13.5%) of respondents washed their hands before wearing gloves and only 77 (12.2%) washed hands before touching a patient. However 263 (41.8%) washed hands after glove removal and 489 (77.7%) reported washing their hands before leaving the patient area. All the doctors and nurses 433(100%) washed their hands before aseptic procedures.

About 63% reported having access to hand washing materials only 50% of the time, 10.7% reported rarely having soap and water to wash hands. Regular access to hand washing materials among the different health workers were respectively 7%, 5.5%,17.6% and 1.7% among Doctors, Nurses, MLSs and Health Attendants.

Table 3: Access to hand washing materials and Practice of hand washing in the hospital setting

Variables	Frequency (N = 629)	Percent
Do you have all the necessary materials to wash hand (running water plus soap) when you need to?		
• Always (100% of the time)		
• Often (75% of the time)	51	8.1
• Sometimes (50% of the time)	116	18.4
• Rarely (25% of the time)	395	62.8
• Never (0% of the time)	67	10.7
	0	0.0
In which of these procedures do you always wash your hand?		
• Before wearing gloves	85	13.5
• After removal of gloves	263	41.8
• Before touching a patient	77	12.2
• Before leaving a patient's care area	489	77.7
• Prior to performing aseptic procedure (for doctors and nurses)		
N = 433 (Table 1)	433	100.0

Regarding training, 55.2%, 70.7%, 78.7% and 0% of the Doctors, Nurses, MLSs and Health Attendants respectively reported having been trained formally on infection control. There were significant differences on HH practices among the different professional groups.

Table 4: Availability of hand washing materials and Training on infection control in the different HCWs

	Doctor N = 143 (%)	Nurse N = 290 (%)	Lab Scientist N = 136 (%)	Health attendant/Orderly N = 60 (%)
Access to hand washing materials				
• Always	10 (7.0)	16 (5.5)	24 (17.6)	1 (1.7)
• Often	6 (4.2)	31 (10.7)	76 (55.9)	3 (5.0)
• Sometimes	82 (57.3)	243 (83.8)	36 (26.5)	34 (56.6)
• Rarely	45 (31.5)	0 (0.0)	0 (0.0)	22 (36.7)
• Never	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Trained on infection control				
• Yes	79 (55.2)	205 (70.7)	107 (78.7)	0 (0.0)
• No	64 (44.8)	85 (29.3)	29 (21.3)	0 (0.0)

All the doctors and nurses practiced hand hygiene before aseptic procedures, however, HH before wearing gloves was poor but similar among doctors and nurses (16.1% and 16.9% respectively), poorer (9.6%) among MLSs and zero among Health attendants (Table 5)

Table 5: Hand washing practices among different health workers

Procedures	Doctor N = 143 (%)	Nurse N = 290 (%)	Lab Scientist N = 136 (%)	Health attendant/ Orderly N = 60 (%)
• Before wearing gloves	23 (16.1)	49 (16.9)	13 (9.6)	0 (0.0)
• After removing gloves	86 (60.1)	95 (32.8)	71 (52.2)	11 (18.3)
• Before touching a patient	22 (15.4)	46 (15.9)	9 (6.6)	0 (0.0)
• Before leaving a patient's care area	127 (88.8)	213 (73.4)	119 (87.5)	30 (50.0)
• Prior to performing an aseptic procedure	143 (100.0)	290 (100.0)	136 (100.0)	0 (0.0)

Likelihood-ratio $\chi^2 = 85.452$; P value = 0.000*

*Significant

DISCUSSION

The importance of hand washing can never be over emphasized. The present study revealed good knowledge of HH. This should be applauded and is similar to findings from an earlier study in a tertiary health institution in South West Nigeria where knowledge of HH was found to be 83%.¹⁷ Present finding is substantially higher than was previously reported among doctors in a tertiary health institution in Benin, Nigeria where the knowledge score was only 43.9%.¹¹ Another study in Iran revealed only moderate knowledge of HH.²⁰ These findings show there has been an improvement in knowledge of HH over the years. The result in the present study is expected as more than 60% of the respondents received formal training on HH.

All the respondents knew that HH is an important component of infection control. This is quite impressive and efforts should be made to sustain it. Similar high level knowledge has been previously reported in different parts of Nigeria. In a study among tertiary health professionals in Kano, northern Nigeria, 99.3% of the respondents knew that HH was part of infection control.²¹ Also, 96.3% of HCWs studied by Bello et al in southern Nigeria had this knowledge.²² This thus implies that training on HH was perhaps widely conducted among HCWs in Nigeria.

Unfortunately, this high knowledge did not cut across all the 5 moments of HH. Less than half of the HCWs knew that hand washing was indicated before touching a patient. The CDC also recommends hand washing before and after contact with

every patient.²³ The lack of this knowledge often times translates to very poor practice of hand washing before touching patients. This trend has been noted by previous studies in Nigeria where hand hygiene compliance rate was least 'before touching a patient.'^{24,25} This ugly tendency calls for urgent redress for if left unchecked could result in wide spread of HAIs to patients from HCWs.

Hand hygiene practice before leaving patient care area in our study was generally high. This practice was higher among doctors (88.8%) than nurses (73.4%). This is in contrast with a previous study in Nigeria where compliance rate was significantly higher among the nurses (72.9%) compared to the doctors (59.7%).²³ Other studies outside Nigeria also report a higher hand hygiene compliance rate among nurses than doctors.^{15,16} These differences in practice could be related to trainings and availability of the resources for HH.

The importance of formal training on infection control and hand hygiene cannot be overemphasized. From our findings, only doctors, nurses and MLS received some infection control training, whereas the health attendants/orderlies did not. The health attendants are involved in the cleaning of the wards and handle items soiled with infected body fluids. This gap must be addressed because apart from leading to cases of infection amongst them, they also transfer infections from one patient to another. Recent studies have reported the importance of training of hospital cleaning staff on infection control.²⁵ In our study, MLS had the most formal training on infection control followed by the nurses. This could be due

to the curriculum or course content during undergraduate study. It was surprising to note that just a little more than half of the doctors received any formal training on infection control. This is very worrisome since the doctors come in contact with patients every day and are at risk of infections as well as spreading from patient to patient. Training has been found to have a positive effect on the practice of hand hygiene.^{27,28}

Our study also found that hand washing materials were not available readily for the practice of hand hygiene and this could have greatly affected the practice in all the health workers. The MLSs had more access to resources probably because they were also better trained and as such made the availability a priority. Generally, the access to hand washing materials in our study population was appalling. The lack of hand hygiene resources has been implicated as a reason for poor hand hygiene practices.^{11,20} It is rather obvious that even though the health workers understand the importance of hand hygiene, it becomes a challenge when the resources such as soap and water are not available in the work environment.

CONCLUSIONS

/RECOMMENDATIONS

Knowledge of HH was generally high among the HCWs. However knowledge of hand washing before touching a patient was poor. The practice was high for some moments of HH but poor for others. Unavailability of HH resources is implicated. Hand Hygiene materials and resources should be regularly provided for the hospital to improve on the practice. More HH trainings should be given to all HCWs including the hospital attendants.

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