

Hand hygiene: A self reported practice among health care workers in tertiary health institutions in Plateau State, Nigeria

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Abstract

Background: Effective hand hygiene is the simplest proven and most cost effective means of reducing hospital acquired infections both among the health care providers and the receipts of health care services. Hospital acquired infections have currently been identified as one of the challenges of health care delivery worldwide in view of its contribution to morbidity and mortality. Hence, it became imperative to assess the knowledge and practices of hand hygiene as well as its determinant among frontline health care workers in tertiary health institutions in Jos Plateau state Nigeria.

Methodology: This was a cross sectional study conducted among 236 health care workers in two tertiary health institutions using quantitative method of data collection. Epi info version 7 was used for data analysis, Chi square test was used with odds ratio as point estimates and 95% confidence interval as the interval estimate. A probability value of less than 0.05 was considered statistically significant.

Results: The mean age of the respondents was 37.1 ± 7.2 years while 121 (51.3%) of the respondents had good knowledge of hand hygiene and self reported good hand hygiene practice found among 134 (56.8%) of the health care workers.

Conclusion: This study has brought to light the unsatisfactory level of practice of hand hygiene among health workers and the need to urgently provide interventions to addressing it.

Keywords: Knowledge, Practice, Hand hygiene, health care worker, Nigeria.

1. Introduction

Hand hygiene encompasses any action of hand cleansing by using water and detergent and/or the use of alcohol based hand sanitizers for the removal of transient microorganisms on hand surfaces.[1-3] Effective hand hygiene is the simplest proven and most cost effective means of reducing hospital acquired infections both among the health care providers and the receipts of health care services.[2] Hospital acquired infections have currently been identified as one of the challenges of health care delivery worldwide in view of its contribution to morbidity and mortality.[3] Hand hygiene is a basic component of standard safety precautions in the course of health care provision as required by World Health Organization (WHO).[4-6] However, in spite of the known benefits of

hand hygiene and its simplicity, its proper practice among health care workers has remained low globally.[3] The Centers for Disease Control and Prevention (CDC) estimates that about 2 million patients develop hospital acquired infections annually as a result of poor hand hygiene practices of health care workers.[7] Hence, it became imperative to assess the knowledge and practices of hand hygiene as well as its determinant among health care workers in tertiary health institutions in Plateau state Nigeria.

2. Methodology

2.1 Study area

This study was carried out in two tertiary health institutions in Plateau state North central Nigeria. Jos University Teaching Hospital (JUTH) is a government

owned over 500 bed capacity while Our Lady of Apostles Hospital (OLA) is a faith based health institution owned by the Catholic Church with an estimated 132 bed capacity. Both hospitals offer diverse and specialized services in various aspects of healthcare, training and research.

2.2 Study population

The study population consisted of medical doctors and nurses providing healthcare services in these health institutions between the months of November 2016 and February 2017.

2.3 Study design

This was a cross sectional study conducted to determine the level of knowledge and practice of hand hygiene as well as its determinants among health care workers in tertiary health institutions in Plateau state

2.4 Sample size estimation

The sample size for this study was determined using the appropriate sample size determination formula for a cross sectional study.[8] Where n is the minimum sample size, Z is the standard normal deviate at 95% confidence interval (1.96), q is the complementary probability ($1 - p$), d is the precision of the study set at 0.05 and p is the proportion of health care workers with good knowledge of hand hygiene from a previous similar study (93%) 0.93. [9] This gave a minimum sample size of 236 after addition of 10% adjustment to cater for non, poor and incomplete responses.

2.5 Criteria for inclusion in the study

Resident doctors and nurses who had been engaged in providing health care services in these tertiary health institutions for at least 6 months prior to the commencement of the study, who had given consent for participate were included in the study.

2.6 Sampling technique

A two stage approach to sampling was employed in this study; Jos University Teaching Hospital and Our Lady of Apostles Hospital were selected from the list of the three tertiary health institutions in the state using simple random sampling technique by balloting. This stage was then followed by the use of proportion to size technique to determine the number of resident doctors and nurses to be selected in the respective health institutions by dividing the number of eligible resident doctors in each of the hospitals by the total number of eligible resident doctors in the two hospitals multiplied by the sample size for the study. This was also done for the nurses respectively. The total number of eligible resident doctors was 300 and 20 in JUTH and OLA hospitals respectively while the number of eligible nurses was 600 and 50 nurses in JUTH and OLA respectively. This gave a total of 74 and 12 resident doctors to be sampled in JUTH and OLA hospitals respectively as well as 130 and 20 nurses to be sampled in the two health institutions respectively. Following which computer generated table of random numbers was used to select 74,

and 12 resident doctors from the already serialized sampling frame of 300 and 12 respectively and 130 and 20 nurses respectively. The selected resident doctors and nurse were identified in their various units and subsequently sampled.

2.7 Data collection

A semi-structured adapted WHO self administered questionnaire on hand hygiene for health care workers comprising of four sections was used to obtain information on the socio-demographic and occupational characteristics of the respondents, their knowledge and practice of hand hygiene as well as factors influencing hand hygiene practices.[8] Three research assistants were trained on the content and method of administration of questionnaire prior to the commencement of the study by the principal researcher. The data collection instrument was pretested in Plateau state specialist hospital. Ethical clearance was obtained from both Jos University Teaching Hospital and OLA hospital institutional health research ethical committees. Written and verbal informed consents were obtained from all the respondents with confidentiality and anonymity of their responses assured and maintained.

2.8 Scoring and grading of responses

The understanding of the concept of hand hygiene was adjudged as good if the respondents provided information with similar contents as any action of hand cleansing by using water and detergent and/or the use of alcohol based hand sanitizers for the removal of transient microorganisms on hand surfaces.[1]

A total of 13 stem questions were used to assess the respondents' knowledge of hand hygiene with maximum possible responses of 64 out of which 27 were correct. One mark was allocated to every correct response while zero mark to the incorrect responses giving a maximum attainable score of 27 marks. A percentile graph was then applied to the scores of the respondents and scores corresponding to the 50th percentile and above were graded as good knowledge while those below the 50th percentile as poor knowledge respectively.

The practices of hand hygiene was assessed with a total of 17 stem questions each on a four point rating scale was with four points allotted to the most favourable response and 1 point to the least favourable response which gave a maximum attainable score of 68. Similarly, a percentile graph was then applied to the scores of the respondents and scores corresponding to the 50th percentile and above were graded as good practice while those below the 50th percentile as poor practice respectively.

2.9 Data analysis

The data obtained were processed and analyzed using Epi info statistical software version 7 where the socio-demographic characteristics of the respondents were expressed in frequency and percentage. Mean \pm standard deviation was used as summary index for age, duration of

practice, hand hygiene knowledge and practice scores of the respondents. Chi square test was used to the determine association between the practice of hand hygiene and its determinants, odds ratio was used as point estimates while 95% confidence interval used as the interval estimate. A probability value of less than 0.05 was considered statistically significant.

3. Results

The mean age of the health care workers was 37.1 ± 7.2 years with 134 (56.3%) older than 35 years of age. More than half (52.5% and 63.6%) of the respondents were females and nurses respectively while 155 (65.7%) had been in practice for the duration of 6 years and more. More importantly, 158 (66.9%) of the respondents had attended at least one hand hygiene related training within 5 years year preceding this study. (Table 1)

Table 1: Socio-demographic characteristics of the respondents

Characteristics	Frequency	Percentage
Age (years)		
< 35	102	43.2
≥ 35	134	56.3
Total	236	100.0
Mean age	Mean ± SD 37.1 ± 7.2 years	
Sex		
Male	112	47.5
Female	124	52.5
Total	236	100.0
Category		
Medical doctor	86	36.4
Nurse	150	63.6
Total	236	100.0
Duration of practice (years)		
≤ 5	81	34.3
> 6 and above	155	65.7
Total	236	100.0
Duration of practice	Median (IQR) 7 (5-11.5) years	
Attendance of training on hand hygiene within the last 5 years		
Attended	78	33.1
Not attended	158	66.9
Total	236	100.0

SD =Standard Deviation, IQR= Inter-quartile Range

All the health care workers in the study had heard of hand hygiene with majority 93.6% being knowledgeable about the concept of hand hygiene. Surprisingly, most (73.1%) of the health care workers did not know the required duration of effective hand washing while knowledge of hand hygiene in between patients care was affirmed by 200 (87.3%) of them. The overall level of knowledge of hand hygiene was found to be good among 121 (51.3%) of the respondents with a mean knowledge score of 18.6 ± 3.7 out a maximum of 27. (Table 2)

Table 2: knowledge of Hand Hygiene among respondents

Parameter	Frequency	Percentage
Awareness of hand hygiene		
Yes	236	100.0
No	0	0.0
Total	236	100.0
Understanding of the concept of hand hygiene		
Good	221	93.6
Poor	15	6.4
Total	236	100.0
Awareness of duration of effective hand washing		
Yes	51	26.9
No	185	73.1
Total	236	100.0
Situations requiring hand hygiene*		
In-between patients	200	87.3
Before handling a patient	95	40.3
After Handling patients	110	46.6
At the close of work	71	30.1
Level of knowledge		
Good	121	51.3
Poor	115	48.7
Total	236	100.0
Knowledge Score	Mean ± SD 18.6 ± 3.7 out of 27	

* Multiple responses allowed, SD =Standard Deviation

Self reported practice of hand hygiene such as hand washing and removal of jewellery by the respondent in course of discharging their duties revealed that only 29 (12.3%) always did this before handling patients while 48 (20.3%) reported always practicing same after handling patients. The practice of hand hygiene following handling of blood, blood products and body fluids of patients was reported by majority (82.2%) of the health care workers assessed. The overall level of self reported practice of hand hygiene was adjudged to be good among 134 (56.8%) of the health care workers with a mean practice score of 31.3 ± 3.8 out of a total of 68. (Table 3)

Table 3: Self Reported Practice of Hand Hygiene by Respondents

Practice of hand hygiene	Frequency	Percentage
Before handling patients		
Always	29	12.3
Most of the time	110	46.6
Sometimes	96	40.7
Never	1	0.4
Total	236	100.0
After handling patients		
Always	48	20.3
Most of the time	113	47.9
Sometimes	74	34.1
Never	1	0.4
Total	236	100.0
After handling blood, blood products and body fluid		
Always	194	82.2
Most of the time	33	14.0
Sometimes	9	3.8
Never	0	0.0
Total	236	100.0
Practice of hand hygiene		
Good	134	56.8
Poor	102	43.2
Total	236	100.0
Practice score	Mean ± SD 31.3 ± 3.8 out of 68	

SD =Standard Deviation

Age of the respondents was found to have significant influence on the practice of hand hygiene as 41 (40.2%) of those below 35 years of age were adjudged to have self reported good practice as compared to 93 (69.4%) of those above 35 years of age ($\chi^2 = 20.132$; odds ratio = 3.4; 95% Confidence interval =1.967 – 5.792). Similarly, good practice of hand hygiene was found among health care

workers who had being in practice for over 6 years when compared to those in practice less than 6 years ($\chi^2 = 7.647$; odds ratio = 2.2; 95% Confidence interval =1.244 – 3.712). Furthermore, availability of water supply in the facility was also found to have positive influence on the practice of hand hygiene with the odds of 8.3 as compared to situations with absence of water supply. (Table 4)

Table 4: Determinants of practice of hand hygiene

Factors	Level of practice		χ^2	OR (95% CI)	p - value
	Poor Freq (%)	Good Freq (%)			
Age (years)					
< 35	61 (59.8)	41 (40.2)	20.132	3.4 (1.967 – 5.792)	< 0.001
≥ 35	41 (30.6)	93 (69.4)			
Total	102	134			
Sex					
Female	47 (37.9)	77 (62.1)	3.010	0.6 (0.377 – 1.063)	0.083
Male	55 (49.1)	57 (50.9)			
Total	102	134			
Category					
Medical doctor	39 (45.3)	47 (54.7)	0.250	1.2 (0.672 – 1.955)	0.617
Nurse	63 (42.0)	87 (58.8)			
Total	102	134			
Duration of practice					
≤ 5	45 (55.6)	36 (44.4)	7.647	2.2 (1.244 – 3.712)	0.006
> 6 and above	57 (36.8)	98 (63.2)			
Total	102	134			
Level of knowledge					
Poor			0.505	0.8 (0.480 – 1.440)	0.477
Good	47 (40.9)	68 (59.1)			
Total	55 (45.5)	66 (54.5)			
	102	134			
Previous training					
No	72 (45.6)	86 (54.4)	1.075	1.4 (0.770 – 2.329)	0.230
Yes	30 (38.5)	48 (61.5)			
Total	102	134			
Availability of water					
No	68 (72.3)	26 (27.7)	53.983	8.3 (4.410 – 15.740)	< 0.001
Yes	34 (23.9)	108 (76.1)			
Total	102	134			
Availability of hand washing facility					
No	28 (44.4)	35 (55.6)	0.052	1.1 (0.599 – 1.914)	0.819
Yes	76 (53.5)	66 (46.5)			
Total	102	134			
Availability of hand drying materials					
No	18 (26.1)	51 (73.9)	11.664	0.4 (0.188 – 0.646)	< 0.001
Yes	84 (50.3)	83 (49.7)			
Total	102	134			

4. Discussion

The level of aware of hand hygiene was found to be high with majority of the health care worker displaying good understanding of the concept hand hygiene. Furthermore, most of the health care worker affirmed that hand hygiene was essential in between patient care. This is in keeping with findings of another Nigerian.[10] This synergy could be due to that fact that both study studies

were conducted in a similar setting. Knowledge of duration of effective hand washing was found to be appropriate among just about a quarter of the respondents in this study with shared similarities with findings of studies conducted in Nigeria and India.[10,11] However, a higher level of knowledge of duration of effective hand washing was observed in another study.[12] This variation should be training related with only about a third of the respondents in

this study having attended hand hygiene related training within the last five years while more than half of the participants in the study with a better level of knowledge of duration of effective hand washing having attended similar training. This has also brought to light the need for continuous on the job training as well as in house step down training to those who had not attended such trainings.

Good knowledge of hand hygiene was found among just about half of the health care workers in this study which is consistent with what was observed in a Ghanaian study but slightly higher than the findings of studies conducted in Indian and Nigeria while another Nigeria study had a higher level of knowledge of hand hygiene.[10-13] This shared similarity and variations could be attributable to varying levels availability of hand hygiene promoting systems and tools such as attendance at trainings as well as the availability of posters and other Information Communication and Education materials (IEC) within the facility of practice.

The overall level of practice of hand hygiene was found to be good among slight above half of the studied participants which was found to be in tandem findings of a study conducted in Lagos.[12] Conversely, other studies reported findings lower than what was obtained in this study. [3,10] It is important to note that practice was self reported in this study which could have elicited more desired response as against the actual practice. Hence, it will be imperative that other studies be carried out using observational approach to determining the practice of hand hygiene.

Age, duration of practice, availability of water supply and availability of hand drying materials were identified determinants of the hygiene practice in this study. Other studies have found sex of the respondents, duration of practice, water supply, availability of disposable hand towels, patient load and proximity of hand washing facility as potent determinants of hand hygiene practice.[3,10,12-15]

5. Conclusion

This study has brought to light the unsatisfactory level of practice of hand hygiene among health workers. In order to ensure that health care works do not serve as conduits for hospital acquired infections, factors such as duration of practice, age, availability of water supply and hand drying materials should be taken into consideration in the development and structuring of targeted intervention aimed at improving hand hygiene practice.

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