

Perceptions, Attitude and Knowledge of Five Moments of Hand Hygiene Practices among Healthcare Workers in Awka Anambra Nigeria

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Abstract

Background/Objectives: The practice of hand hygiene by healthcare workers is critical to preventing Healthcare-associated infections. This study was designed to assess the knowledge, attitude and hand hygiene practices among healthcare workers (HCWs) in Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Amaku, Awka, Nigeria.

Methods: A pretested, structured, self-administered questionnaire was used to collect data on the participant's demographics, their knowledge and attitude to hand hygiene practices. The data collected were analyzed using Statistical Package for Social Sciences (SPSS-20) and presented as frequency and percentages response.

Results: Of the 100 questionnaires distributed, 77 questionnaires were adequately filled and returned. HCWs agreed to hand washing before activities such as Palpation (55.8%), before giving injections (68.8%), and after emptying a bed pan (93.5%). HCWs are motivated to wash their hands because of fear of contracting infection. Busy work schedule in between patients militates against good practice of hand washing.

Conclusion: More than half (53.2%) of the HCWs did not receive formal training on hand hygiene in the last 3 years and majority lacked the knowledge of good hand washing techniques. Hand washing was higher after patient contact than before contact. Hand washing can be improved by administrative order, educational programmes and increased surveillance.

Keywords: Hand hygiene; Compliance; Health care workers; Awka; Noscomial infection; Infection prevention and control

Introduction

Healthcare-associated infection is a significant public health crisis. Healthcare-associated infections (HAIs) are thought to be transmitted by the hands of Healthcare Workers (HCWs) and poor hand hygiene (HH) compliance increases the risk of hospital acquired infections (HAIs) [1,2]. Prevention and surveillance of HAIs are key priorities in the interest of health care optimization of patient safety. HAIs contribute greatly to prolonged hospital stay and disability, increased mortality, increased microbial resistance to drugs as well as increased cost to patient, family members and health care facilities [3-5]. The Prevalence rates of patients affected by HAI ranged from 4.6% to 9.3% in developed countries [4]. The shortage and unreliability of laboratory data and poor medical records don't guarantee reliable HAI burden estimates in developing countries. However, the burden and risks of HCAI are bound to be higher because of unfavorable factors such as understaffing, poor hygiene and sanitation, paucity of basic equipment, inadequate structures and overcrowding [3,4,6].

The WHO's five hand hygiene moments are washing:

1) Before touching a patient

2) Before clean/aseptic procedure

3) After fluid exposure risk

4) After touching a patient

5) After touching patient surroundings [8]

Many factors influence practice of hand hygiene. Such include unavailability of hand washing sinks, time required to perform hand hygiene, patient's condition, effect of hand-hygiene products on the skin and inadequate knowledge of the guidelines [4,7]. Adequate Hand hygiene is critical for preventing HAIs. Clean Care is a Safer Care [4]. Hand hygiene is the primary measure to HAIs. A simple action, however, the lack of compliance among health-care workers is a global problem. Hospital-acquired infection rates are on the increase in teaching hospitals. Surveillance is particularly relevant in our locality where basic infection control measures are usually lacking. There is a paucity of studies on hand hygiene practices among HCWs in the Southeastern Nigeria. This study was therefore designed to assess the knowledge, attitude and hand hygiene practices as well as identify factors that could motivate hand washing practices among healthcare workers (HCWs) in Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Amaku, Awka, Nigeria.

Methods

Study location, design and participants

This study was conducted at Chukwuemeka Odumegwu Ojukwu University Teaching hospital Amaku, Awka-Nigeria after obtaining ethical approval from the hospital ethical committee (COOUTH/AC/VOL.XI/0007) and informed consent from the participants. The study populations were Healthcare workers attending to outpatient and inpatient clinics of the hospital. The stratified random sampling/ Descriptive cross-sectional design was used in the collection of samples from 100 participants.

Study design

This was a cross-sectional descriptive study, designed to assess the knowledge, attitude and practice of hand washing methods and also to identifying factors that could influence hand washing practices by HCWs.

Data collection/Questionnaire study

Data collection was done in June 2017, using a pretested, structured, self-administered questionnaire which were given to the respondents in the ward and were collected thereafter. The questionnaire was used to collect data on the participant's demographics, including age, gender, marital status, profession; year(s) of experiences in addition to questions regarding their knowledge and attitude to hand hygiene practices. The key components of the questionnaire include: Knowledge on the transmission of germs in relation to health care associated infections, the Hand washing routine practiced by the participants, variation in choice of disinfection between Alcohol based hand rub and hand washing with soap and water, kill variation exposure time needed for alcohol based hand rub to kill most germs on the hands and hand hygiene method required for certain situations.

Data analysis

The data collected were presented as frequency and percentages response. Average age was computed using descriptive statistics. Level of statistical significance was set at 5% ($p \leq 0.05$). Data were analyzed using Statistical Package for Social Sciences (SPSS-20).

Results

Of the 100 questionnaires distributed, 77 questionnaires were adequately filled and returned (Table 1). This gives a response rate of

77%. A higher percentage of HCWs were females [40 (51.9%)] than the males [37 (48.1%)]. Also, 42 (54.5%) of the participants were single while 35 (45.5%) were married and all distributed among the 0-5, 6-10, and 11-15 years of experience. Majority, (72.7%) of the respondents had spent between 0 to 5 years in service. There was higher participation by Nurse 32 (41.6%) than doctors 21 (27.3%) and Laboratory Scientists 24 (31.2%).

Variables	Variable category	N (%)
Sex	Male	37 (48.1)
	Female	40 (51.9)
Marital status	Single	42 (54.5)
	Married	35 (45.5)
Year of experience	0-5 years	56 (72.7)
	6-10 years	18 (23.4)
	11-15 years	3 (3.9)
	Above 15 years	0 (0)
Average age	--	30.75 ± 3.69
Religion	Christian	77 (100)
	Muslim	0 (0)
	Others	0 (0)
Profession	Doctors	21 (27.3)
	Nurse	32 (41.6)
	Lab Scientists	24 (31.2)

Table 1: Socio-demographic characteristics of healthcare workers.

Table 2 shows the Hand washing routine practiced by the participants, a greater percentage maintained relatively good to excellent practice of the use of alcohol (24.7%), use of antiseptics (11.7%), as against the use of inappropriate methods such as running tap water only (2.6%). The results shows that a good number of HCWs had formal training in hand hygiene which explains the longer time used in washing 30 seconds (64.9%) as against (29.9%) who disagreed.

		Response, N (%)		X ² and P-values
		Yes	No	
Components of hand washing include the following except that.	Use of soapy water in basin	11 (14.3)	-	X ² =21.631 P=0.006
	Use of running tap water only	2 (2.6)	-	
	Use of running water and antiseptic	9 (11.7)	-	
	Use of alcohol only	19 (24.7)	-	
	All of the above	36 (46.8)	-	
Effective hand washing should last for at least 30 seconds.	Yes	50 (64.9)	-	X ² =28.831

	No	23 (29.9)	-	P=0.0005
	I don't know	4 (5.2)	-	
Did you receive formal training in hand hygiene in the last 3 years?	Yes	36 (46.8)	-	X ² =12.233 P=0.002
	No	41 (53.2)	-	
	I don't know	0 (0)	-	
Do you routinely use an alcohol based hand rub for hand hygiene?	Yes	18 (23.4)	-	X ² =14.425
	No	59 (76.6)	-	
	I don't know	0 (0)	-	

Table 2: Hand washing routine practiced by the participants, values in parenthesis indicate the frequency of respondents expressed in percentage. Healthcare workers with unclean hands as well as patients in areas colonize.

Table 3 shows the knowledge of the HCWs on germs transmission by the participants in relation to Health care associated infections. Majority of the HCWs who participated in this study attested to poor hand hygiene and hospital hygiene as a major link to transmission of germs. Majority of HCWs agreed that transmission to patients is reduced by prompt hand hygiene actions before, between and after attending to patients (Table 4) The Table 5 shows the results of the response of participant on their knowledge of hand hygiene actions in relation to transmission of germs. The level of awareness and choice of disinfection between Alcohol based hand rub and hand washing with soap and water are shown in Table 5.

HCWs agreed to hand washing before activities such as Palpation (55.8%), before giving injections (68.8%), and after emptying a bed pan (93.5%). The Table 6 shows the perception and technique of hand hygiene among participants required for certain situations.

Majority of the participating HCWs opted for washing of the hands as the most adequate choice of hand hygiene routine for certain medical activities.

		Response	X ² and P values
Which of the following is the main route of cross transmission of potentially harmful germs between patients in a health care facility?	Health care workers hand when not clean	31 (40.3)	X ² = 20.043 P = 0.003
	Air circulating in the hospital	7 (9.1)	
	Patient's exposure to colonized surface	30 (39.0)	
	Sharing non-invasive objects	9 (11.7)	
What is the most frequently source of germs responsible for health care associated infections?	Hospital's water system	3 (3.9)	X ² = 9.210 P = 0.162
	The hospital's air	5 (6.9)	
	Germs already present on or within the patient	10 (13)	
	The hospital environment (surfaces)	59 (76.6)	

Table 3. Transmission of germs in relation to health care associated infections, values in parenthesis indicate the frequency of respondents expressed in percentage.

		Response		X ² and P-values
		Yes	No	
Which of the following hand hygiene actions prevents transmission of germ to the patient?	Before touching a patient	72 (93.5)	5 (6.5)	X ² =4.456 P=0.108
	Immediately after a risk of body fluid exposure	73 (94.8)	4 (5.2)	X ² =11.251 P=0.004
	After exposure to the immediate surroundings of the patient	71 (92.2)	6 (7.8)	X ² =9.151 P=0.010

	Immediately before clean/aseptic procedure	69 (89.6)	8 (10.4)	$\chi^2=0.487$ P=0.784
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Table 4: Hand hygiene actions in relation to transmission of germ. Values in parenthesis indicate the frequency of respondents expressed in percentage.

Variables	Response		χ^2 and P-values
	True	False	
Hand rubbing is more rapid for hand cleaning than hand washing.	58 (75.3)	19 (24.7)	$\chi^2=0.564$ P=0.754
Hand rubbing causes skin dryness more than hand washing.	66 (85.7)	11 (14.3)	$\chi^2=3.269$ P=0.159
Hand rubbing is more effective against germs than hand washing.	10 (13.0)	67 (87.0)	$\chi^2=6.206$ P=0.045
Hand washing and hand rubbing are recommended to be performed in sequence.	75 (97.4)	2 (2.6)	$\chi^2=2.888$ P=0.236

Table 5: Variation in choice of disinfection between alcohol based hand rub and hand washing with soap and water, values in parenthesis indicate the frequency of respondents expressed in percentage.

Variables	Response			χ^2 and P-values
	Rubbing	Washing	None	
Before palpation of abdomen	30 (39.0)	43 (55.8)	4 (5.2)	$\chi^2=14.976$ P=0.005
Before giving injection	14 (18.2)	53 (68.8)	10 (13.0)	$\chi^2=5.092$ P=0.278
After emptying a bed pan	5 (6.5)	72 (93.5)	0 (0)	$\chi^2=3.770$ P=0.152
After visible exposure to blood	5 (6.5)	72 (93.5)	0 (0)	$\chi^2=7.520$ P=0.023

Table 6: Hand hygiene method required for certain situations, values in parenthesis indicate the frequency of respondents expressed in percentage.

Table 7 shows the perception associated with likelihood of HAIs linked to colonization of hands as a result of certain personal behaviors/behavioral attitudes. Majority responded to a likelihood of certain attitudes linked to colonization by germs. Greater percentage agreed that wearing jewelries (88.3%) and fixing of artificial nails (100%) increases the risks of microbial colonization of hands of HCWs. Tables 8 and 9 show the Hand hygiene attitude and practice among HCWs. All the HCWs (100%) attested to washing their hand after patient contact or beside procedure and at the close of work.

Variables	Response		χ^2 and P-values
	Yes	No	
Wearing jewelries	68 (88.3)	9 (11.7)	$\chi^2=8.493$ P=0.014
Washing skin	11 (14.3)	66 (85.7)	$\chi^2=7.000$ P=0.030
Artificial fingernail	77 (100)	0 (0)	—
Regular use of hand cream	37 (48.1)	40 (51.9)	$\chi^2=0.312$ P=0.855
Do you need to clean your hand with towel after washing?	50 (64.9)	27 (35.1)	$\chi^2=0.123$ P=0.940

Table 7: Attitude and practices associated with increased likelihood of colonization of hands, values in parenthesis indicate the frequency of respondents expressed in percentage.

Discussion

Hand washing with soap/detergent is an important means of preventing HAIs. Ignorance, inaccessible wash sinks and workloads are major barriers to hand hygiene compliance [8-10]. This study revealed that more than half (53.2%) of the HCWs did not receive formal training on hand hygiene in the last 3 years and majority lacked the knowledge of good hand washing techniques as 76.6% don't routinely use an alcohol based hand rub for hand hygiene.

Our findings are similar to a similar study at a Teaching Hospital in Port Harcourt, south southern Nigeria in which 55.4% of the HCWs lacked good knowledge of hand washing [10]. Alcohol based method of disinfection were not the major choice amongst the participants who also had formal training on hand hygiene as 46.8% of the HCWs combines the Alcohol based method with other washing techniques.

Variables	Response					X ² and P-values
	Strongly agree	Agree	Indifferent	Disagree	Strongly disagree	
Hand washing can be protective to HCWs	41 (53.2)	31 (40.3)	-	-	5 (6.5)	X ² =2.650 P=0.618
Hand washing should be done when in contact with all patients and patient's deformities	52 (67.5)	20 (26.0)	-	-	5 (6.5)	X ² =5.515 P=0.238
Hand washing is often not adhered to because of busy work schedule in between patients	27 (35.1)	32 (41.6)	5 (6.5)	8 (10.4)	5 (6.5)	X ² =14.759 P=0.064
HCWs are motivated to wash their hands because of fear of contracting disease	47 (61.0)	21 (27.3)	4 (5.2)	-	5 (6.5)	X ² =24.270 P=0.0005
Hand washing can be improved by administrative order and continuous health education	60 (77.9)	10 (13.0)	2 (2.6)	3 (3.9)	2 (2.6)	X ² =13.876 P=0.085

Table 8: Attitude of respondents towards hand washing, values in parenthesis indicate the frequency of respondents expressed in percentage.

	Response		X ² and P-values
	Yes	No	
Wash hands before patients contact or beside procedure	69 (89.6)	8 (10.4)	X ² =11.276 P=0.004
Wash hand after patient contact or beside procedure.	77 (100)	0 (0)	
Dry hands after washing	63 (81.8)	14 (18.2)	X ² =11.828 P=0.003
Washing of hands after the close of day's work	77 (100)	0 (0)	
Total	71.5 (92.85)	5.5 (7.15)	
			X ² = 178.00 p-value= 0.0005

Table 9: Hand hygiene practice among HCWs, values in parenthesis indicate the frequency of respondents expressed in percentage.

A similar low acceptance of alcohol based hand rubs as a suitable alternative for HH has been reported in Jamaica by Alison et al. [3]. They stated that the HCWs were not aware of the efficacy of the alcohol based hand rubs in comparison with soap and water. The HCWs also attributed their poor acceptance to the smell and feel of the alcohol based hand sanitizers [11]. WHO Consensus recommendations indicated an alcohol-based hand rub as the preferred means for routine hand antisepsis in all other clinical situations provided the hands are not visibly soiled [5,8,9,12,13]. However, when the alcohol-based hand rub is not obtainable, hand washing with soap and water is recommended [5]. Many (93.5%) admitted that hand hygiene actions before touching a patient prevents

transmission of germ to the patient. A positive attitude towards hand washing was also demonstrated in this study (Table 8). A Similar high positive attitude has been previously reported in other studies [6,13].

Our findings (Tables 8 and 9) have also shown that HCWs are motivated to wash their hands because of fear of contracting disease as such tend to wash their hands more often after contact with patients then before contact and also after performing a procedure (100%) than before such procedure (89.6%). Similarly 100% respondents attested to washing of hands after the close of day's work. This is in agreement with the findings of other studies [6,9,8,14]. This observation therefore under-scores the urgent need for administrative order, continuous

health education and interventional measures by hospital management with respect to hand washing policies, emphasizing the need for hand washing before patients-HCWs interaction or any procedure. Adequate Hand hygiene is critical for preventing HAIs. The most important tool in the HCW approach for preventing infection transmission is effective HH practices. The basic rule in hospital is to wash hands between patient contacts [7]. Clean Care is a Safer Care [4] campaign was launched in 2005 as the first Global Patient Safety Challenge aimed at reducing HAIs. Thus the patients are protected from infections if all HCWs comply, practice good and adequate hand hygiene [7,8]. Compliance rates should be optimized and encouraged if the hand hygiene procedure is simple, accessible, comfortable and of short duration. Similarly Compliance rates would be higher when HCWs are sensitized of the impacts of hand hygiene on HCAI's and effective reminders are provided [3]. Few of the wards had reminders, in the form of posters majority of which were very faded and would have lost their impacts. Other strategies of hand hygiene improvement interventions include audits of hand hygiene practices and performance feedback, improvement of water and soap availability etc. [15,16]. The hospital had not recently engaged in any activities aimed at auditing Hand Hygiene. It has been severally been reported that a planned audits of HH compliance with feedback have positively influenced hand hygiene compliance [16]. Similarly providing a regular HH training programme to HCWs is crucial in creating sensitivity and renewing knowledge on the subject. Good knowledge and attitude are fundamental to improved HH compliance [6,9,16-18]. Excellent percentage of study participants (81.8%) indicated that they dry their hands after washing. This is commendable and essential as wet hands have been reported to significantly increase risk of cross-transmission [10].

Conclusion

Conclusively hand washing was higher after patient contact than before contact. Busy work schedule in between patients militates against good practice of hand washing. Artificial fingernail is associated with increased likelihood of microbial colonization of hands. Hand washing can be improved by administrative order and continuous health education. We thus recommended that introduction of administrative orientation/interventional and educational measures such as HH campaign, promotion of hand sanitizers, planned audits of HH/compliance should be encouraged and promoted within the hospital. A limitation of the study is that it could not compare any risk perception/attitude differences between or among Doctors, Nurses, and lab scientists.

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Conflict of Interest

None.

References

1. Birnbach DJ, Rosen LF, Fitzpatrick M, Thomas ER, Arheart KL (2017) A ubiquitous but ineffective intervention: Signs do not increase hand hygiene compliance. *J Infect Public Health* 10: 295-298.
2. Akingbola OA, Singh D, Srivastav SK, Plunkett DS, Combs MM (2016) The impact of hand hygiene posters on hand hygiene compliance rate among resident physicians: A brief report. *Clin Pediatr* 1: 1-2.
3. Nicholson AM, Tennant IA, Martin AC, Ehikhametalor K, Reynolds G, et al. (2016) Hand hygiene compliance by health care workers at a teaching hospital, Kingston, Jamaica. *J Infect Dev Ctries* 10: 1088-1092.
4. Magill S, Edwards J, Bamberg W, Beldavs Z, Dumyati G, et al. (2014) Multistate point-prevalence survey of health care-associated infections. *N Engl J Med* 370: 1198-120.
5. World Health Organization (2009) WHO guidelines for hand hygiene in health care. World Health Organization, Geneva, Switzerland.
6. Ekwere TA, Okafor PI (2013) Hand hygiene knowledge and practices among healthcare providers in a tertiary hospital South West Nigeria. *Int J Infect Control* 9: 1-9
7. Manfred M, Balkhyb HH, Tannous EB, Jong MT (2013) Physician 'defiance' towards hand hygiene compliance: Is there a theory-practice-Ethics gap? *J Saudi Heart Assoc* 25: 203-208.
8. Hart BA and Opara PI (2011) Hand-washing practices amongst health workers in a teaching hospital. *Am J Infect Dis* 7: 8-15.
9. Pittet D, Hugonnet S, Harbarth S, Mourouga P, Sauvan V, et al. (2000) Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *Infection Control Programme. Lancet* 356: 1307-1312.
10. Yawson AE, Hesse AA (2011) Hand hygiene practices and resources in a teaching hospital in Ghana. *J Infect Dev Ctries* 7: 338-347.
11. Maury E, Alzieu M, Baudel JL, Haram N, Barbut F, et al. (2000) Availability of an alcohol solution can improve hand disinfection compliance in an intensive care unit *American Journal of Respiratory and Critical Care Medicine* 162: 324-327.
12. Picheansathian W (2004) A systematic review on the effectiveness of alcohol-based solutions for hand hygiene. *International Journal of Nursing Practice* 10: 3-9.
13. Elaziz KM, Bakr IM (2008) Assessment of knowledge attitude and practice of hand-washing among healthcare workers in Ain Shams University Hospital Cairo. *J Prev Med Hyg* 50: 19-25.
14. Thompson BL, Dwyer DM, Ussery XT, Denman S, Vacek P, et al. (1997) Hand-washing and gloves use in a long-term care facility. *Infect Control Hosp Epidemiol* 18: 97-103.
15. Bischoff WE, Reynolds TM, Sessler CN, Edmond MB, Wenzel RP (2000) Hand-washing compliance by health care workers. The impact of introducing an accessible, alcohol-based hand antiseptic. *Arch Intern Med* 160: 1017-1021.
16. Pittet D (2001) Compliance with hand disinfection and its impact on hospital-acquired infections. *J Hosp Infect* 48 Suppl A: 40-46.
17. Erkan T, Findik UY, Tokuc B (2011) Hand-washing behaviour and nurses' knowledge after a training programme. *Int J Nurs Prac* 17: 464-469.
18. Shah N, Sa'nchez CE, Charani E, Drumright LN, Holmes AH (2015) Towards changing healthcare workers' behaviour: A qualitative study exploring non-compliance through appraisals of infection prevention and control practices. *J Hosp Infect* 90: 126-134.