



Research Article

A survey of hand hygiene knowledge, attitude and practices among health care workers in a tertiary hospital, Southwestern Nigeria

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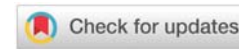
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Abstract

Background: Improper hand hygiene practices among Healthcare Providers (HCPs) are a common risk factor for and interventions to improve hygiene have proven to be effective strategy in reducing nosocomial infection. Hand hygiene has been described as the single most important, simplest and least expensive means of preventing nosocomial infections.

Aim/Objectives: The studied was carried out to determine the knowledge, attitude and practice of hand hygiene among healthcare workers in a tertiary health facility.

Materials/Methods: A cross- sectional study was conducted among 368 doctors, nurses and ward attendants using multistage sampling technique. Data were collected with a set of self- administered, modified WHO questionnaire and analyzed using IBM and SPSS version 25 statistical package.

Results: The mean age of respondents was 35.2±9.3 years, and majority of them were between 36-45years (33.6%). The male to female ratio was 1.6: 1. Most of the respondents were nurses (41.5%) and 370 (98.95%) of the respondents had a good knowledge of hand hygiene. Washing of hands before and after contact with patients was 44.65% and 56.2% respectively. Most of them have received training on hand washing in the last three years (53.4%), 222 (62.7%) respondents routinely used alcohol based hand rub. The main reason cited for not observing hand hygiene practices consistently were lack of running water (53.4%), unavailability of alcohol based hand rub(26.6%), and dirty water sinks (24.0%).

Conclusion: Although knowledge, attitude and practice of hand hygiene were good among respondents in this study, lack of running water and unavailability of alcohol based hand rub remain major constraints. Hospital management should therefore provide adequate water supply and materials for sanitation and hand hygiene in healthcare facilities.

Introduction

Hand hygiene has been identified as an effective means of infection prevention and control in the hospital and even outside of the hospital environment as exemplified by the preventive strategies employed to tackle the corona virus

(Covid-19) pandemic ravaging the world [1,2]. Healthcare workers have been identified as the most common vehicle for transmission of Hospital Acquired Infection (HAI) from patient to patient and within the healthcare environment [3,4]. Since Australian- Hungarian physician Ignaz Semmelweis discovered the importance of hand wash in 1858, good hand hygiene is



considered to reduce infection transmissibility in the hospital setting [5,6]. Although hand hygiene can be described as an effective, simple, cheap and not time consuming HAI control strategy most studies show low compliance rate of between 40% and 70% [7,8]. HCW have reported several factors that negatively impact their adherence with recommended practices including but not limited to; inadequate knowledge and lack of awareness, hand washing agents cause irritation and dryness, sinks are inconveniently located, lack of soap and paper towels, not enough time, over workload with understaffing, lack of knowledge of guidelines/protocols, and forgetfulness [9-12].

According to WHO an estimate 1.4 million patients acquire HAI at any time and improper hand hygiene accounts for about 40 % of this incidence [13]. The prevalence of HAI varies from one region of the world to another. It affects 5-15% of hospitalized patients in developed country with higher figures quoted for developing countries [14,15]. Diarrhoea diseases and respiratory tract infections are among the leading contributors to the global burden of disease and poor water supply related to hand hygiene represents 7% of the risk factors [7].

The fact that hand hygiene significantly reduces nosocomial infection is important in our environment where health facilities are ill-equipped to provide comprehensive support in terms of molecular diagnosis of infectious diseases and high antibiotic resistance due to widespread over the counter procurement [16].

The study was conducted to assess the knowledge, attitude and practice of hand washing among HCW at the Federal Teaching Hospital Ido Ekiti which is a tertiary health centre in Southwestern Nigeria. The study further aimed to identify factors hampering the practice of hand washing among the respondents. The finding of this study would help the management as well as the infection control unit of the hospital to institutionalized appropriate measures to increase the compliance rate of hand hygiene thereby with the ultimate aim of reducing the prevalence of HAI.

Materials and methods

Setting

The study was conducted at the Federal Teaching Hospital, Ido –Ekiti (FETHI), located in Southwestern Nigeria. The hospital was established in 1954 as a general hospital, upgraded to a Federal medical centre in 1988 and became a teaching hospital in 2014. It serves as a referral centre for all other health institutions in Ekiti and neighbouring states. The hospital comprises of 300 bed spaces including Intensive Care Unit (ICU).

Study population

This consists of 260 doctors, 400 nurses and 500 ward attendants as at when the study was carried out. All the doctors, nurses and ward attendants working in the hospital at the time of study and willing to participate were included in the sampling frame. HCW who declined consent and those with injuries, bandages or any other barrier to hand washing were excluded.

Study design

This was questionnaire based cross sectional descriptive study. A multistage sampling technique was used to select participants.

First stage

Six departments (Paediatric, Obstetric and Gynaecology, Community Medicine, Family Medicine, Psychiatry and Internal Medicine) were randomly selected from 11 clinical departments of the hospital using table of random numbers.

Second stage

At the departmental level, HCW in each department were stratified in to doctors, nurses and ward attendants. Questionnaire allocated to each department were subsequently allocated to each stratum.

Third stage

The list of HCW in each stratum was obtained via the departmental Heads and the questionnaire was then administered to participants using systematic random sampling after determining the sampling fraction.

Sample size determination

Sample size was determined using the Fishers formula to obtain a total of 368 based on 95% confidence interval and 5% margin of error. The sampling was limited to doctors, nurses and ward attendants whose hand hygiene practices can either minimize or perpetuate the transmission of infections.

Data collection

Data collection was done using a pretested, structured and self-administered questionnaire. The questionnaire consisted of 4 sections: with section A) exploring the socio-demographic characteristics, B) consisting of questions on the level knowledge and attitude of hand washing, C) consists of the prevalence and practice of hand washing and D) limitations and solutions to problems of hand washing practices. The investigators personally delivered the questionnaires to the participants after a detailed explanation of the study was provided. Written consent was obtained from those who consented and confidentiality was ensured throughout the study.

Data analysis

Data was analysed using IBM and SPSS (statistical package for the social sciences) statistical version 25 using inferential statistics. The data was presented in percentages and frequency table. Results were interpreted and conclusions were drawn.

Ethical

Ethical approval was obtained from the Ethics and Research committee of the hospital.



Results

A total of 368 questionnaires were administered and 354 were appropriately completed and analyzed. The response rate was 96.2 %, out of which 126 (35.6%), 147(41.5%) and 81 (22.9%) were doctors, nurses and ward attendants respectively. There were 134 (37.9%) males and 220 (62.1%) females respectively. Their ages ranged from 17–59 years with a mean of 35.5 ± 9.3 years. The HCW were fairly uniformly distributed across the 6 departments with the highest proportion (20.1%) from Internal Medicine (Tables 1–3).

All the respondents are aware of hand hygiene practices and a large proportion (72.3%) was informed by HCW while in training. Only 53.4% of the participants had ever received any form training on hand washing in the use preceding 3 years however 62.7% routinely alcohol -based hand rub for hand hygiene. Less than half (45.5%) of the HCW under study knew the estimates of hospitalized patients who may develop HAI and only 47.5% of them knew that hand hygiene was very highly effective in preventing HAI.

Eighty –two percent knew that hand washing could prevent respiratory tract infections 96% diarrhoea diseases. Only about 29.7 % of them responded in the affirmative that hand washing was given a high priority in the studied institution, 42.7% said they did not know the average percentage of situations that they actually performed hand rubbing and about two fifth (40.4%) declared that at least one minute is needed for alcohol-based hand-rub to kill germs.

Majority of the respondents chose hand washing over rubbing as a better hygiene method before palpation of patients (61.6%), giving an injection(75.5%), after emptying a bedpan (92.7%), after removing examination gloves (82.2%),

Table 1: Socio- demographic characteristics of the respondents.

Variable	Frequency n=354	Percentage (%)
Age (years)		
15-25	67	18.9
26-35	115	32.5
36-45	119	33.6
≥46	53	15
Gender		
Male	134	37.9
Female	220	62.1
Level of education		
School certificate	66	18.6
Undergraduate	64	18.1
Graduate	224	63.3
Profession		
Ward attendant	81	22.9
Nurse	147	41.5
Doctor	126	35.6
Department		
Internal medicine	71	20.1
Psychiatry	45	12.7
Community medicine	55	15.5
Family medicine	50	14.1
Obstetrics and Gynaecology	66	18.6
Paediatrics	67	18.9

Table 2: knowledge and attitude of hand washing among respondents.

Variable	Frequency n=354	Percentage (%)
Ever heard about hand washing practices		
Yes	354	100.0
Sources of information		
Media	129	36.4
Health workers	256	72.3
Lectures	186	52.5
Friends/ Relatives	91	25.7
Ever received training in hand hygiene in the last 3 years		
Yes	189	53.4
No	165	46.6
Routinely use alcohol- based hand –rub for hand hygiene		
Yes	222	62.7
No	132	37.3
Percentage of patients who develop a HAI		
≤ 10%	62	17.5
11-30	72	20.3
31-50	23	6.5
>51	4	1.1
Don't know	193	54.5
Effectiveness of hand hygiene in preventing		
Very low	6	1.7
Low	18	5.1
High	162	45.8
Very high	168	47.5
What hand can prevent *		
Malarial	91	25.7
Diarrhoea diseases	340	96.0
Pneumonia	242	68.4
Respiratory tract infection	290	81.9
How important is hand washing to your institution		
Low priority	66	18.6
Moderate priority	20	5.6
High priority	163	46.0
Very high priority	105	29.7

*Multiple responses

after making patient bed (77.4%) and after visible exposure to blood (92.7%).

About 57.6% washed their hands over 5 times during their shift and 44.6% practiced hand-washing occasionally before interacting with patients while 56.2% said they practiced it always after having patient interactions. Lack of water was the most identified reason (53.45%) limiting hand washing practice. In fact, about 60% of the HCW said water and soap were only readily available for hand –washing in their department's occasionally. However, 76.6% , 78.5%, and 57.3% of the respondents asserted that their heads of departments, colleagues and patients respectively attached a very high importance to optimal hand hygiene. Also, about 72.3 % thought that they always require substantial efforts to perform good hand hygiene.

Finally on how to improve hand-washing amongst HCWs at the studied centre, 68.1%, 52.8%, 34.7%, and 14.4% suggested provision of adequate alcohol-based sanitizers, provision of adequate soap and water supply, lectures and seminars on hand washing and formulation of firm hand-washing policies respectively.

Table 3: Practices of hand washing among respondents.

Variable	Frequency n=354	Percentage (%)
Average percentage of situations you actually perform hand washing		
≤20%	7	2.0
21-40%	15	4.2
41-60%	23	6.5
61-80%	53	15.0
81-100%	105	29.7
Don't know	151	42.7
Number of times you wash hands		
1-2times	55	15.5
3-5times	95	26.8
Over 5 times	204	57.6
How often do you practice hand-washing before interacting with patients		
Never	44	12.4
Always	133	37.6
Occasionally	158	44.6
No response	5	1.4
How often do you practice hand-washing after interacting with patients		
Never	20	5.6
Always	199	56.2
Occasionally	128	36.2
No response	7	2.0

Discussion

This study assessed the knowledge, attitude and practice of hand washing among HCW in a tertiary hospital setting unlike most previous studies which were community based.

HAIs are an important causes of morbidity and mortality in clinical practice and pose ethical challenge to healthcare delivery (“nonmaleficence –first, don no harm”) [17]. One of the easily identified routes of transmission of HAI is the hands of HCW [18,19]. HAI are a burden to both physicians and patients, as they lead to complications in therapy, overall increase in admission days, increase healthcare costs and may result in mortality [4,20].

All respondents interviewed were aware of hand washing practices. About 99% of the respondents in this study demonstrated good knowledge and attitude to hand- washing practices which are in agreement with other studies in Sokoto, also in Lagos University Teaching Hospital Nigeria and a tertiary healthcare in India that reported 91.7%, 83% and 74% respectively [1,8,21]. The good knowledge of hand hygiene among most of the respondents in this study and others conducted in different populations across Nigeria is likely due to their training in school and the public campaign on hand hygiene in the country as result of recent Ebola virus disease and perennial Lassa fever infection.

Also, the findings from this study show that the rates of compliance in our hospital are still very low as only 29.7% of the HCW could claim to have actually performed hand-washing on an average of 81 to 100% of situations and an alarming 42.7% of them could not even remember. Similarly, only about 56.2% practiced hand-washing after interacting with patients and 5.6% said they never did. The reasons for

this could include lack of continuous educational programme on hand hygiene; unfortunately, HCW in developing countries such as ours consider such programme as mundane. A similar study shows that despite the various advancement in infection control, HCW still do not fully adhere to the recommended hand hygiene practices and as such compliances was still low [5]. In a systematic review by Erasmus, et al. [22], on hand hygiene practices, it was discovered that in ICUs and general wards, the compliance rate was 40% among physicians. This goes to show that even in critical care units in hospitals compliance with hand hygiene is still a topical issue.

The limiting factors in the practices of hand-washing before and after patients contact mentioned by the respondents like lack of water, unavailability of alcohol-based hand-rub, dirty water sinks, forgetfulness among others were in congruous with reports from an earlier study [21]. Hand hygiene has therefore been promoted as one of the tools that will help to mitigate rise in antimicrobial resistance [23].

In this present study, we observed that several personnel did not perform hand hygiene before conducting an invasive procedure but simply went on to don their gloves. This finding buttress the fact that for them hand hygiene was basically for their own protection and not that of the patient or immediate environment.

The behavioural pattern is also seen on our study with low levels of compliance with the WHO five moments of hand hygiene [24,25]. A worrisome trend is the high noncompliance rates of hand hygiene after touching patients at hands of HCW could then become reservoir for the transmission of pathogens among patients. The several infection causing microorganisms are regularly mutating and as such antimicrobial resistance rates are higher in HAI compared to the community [14,26,27]. Such pathogens may therefore enter into the local community via 3 means : HCW, discharged patients who become asymptomatic carrier or the relatives who had visited the hospital.

At the moment, the situation in developing countries is such that hand-washing facilities are suboptimal [28]. Non availability of sufficient sinks and running water are also recognized impediment. In addressing hand hygiene, however, alcohol-based hand rubs are become handy. Furthermore, educational programmes must also be supplemented with the presence of an effective infection control team. There must also be active surveillance system in place to rapidly detect cases of HAI and nip further ones in the bud [29-31]. Such surveillance system may also use personnel who have high rates of patient contact to drive the process.

The highest rates of direct patient contact in this study were in the nurses and the anaesthetists. These two categories of HCW are points of easy access to both patients and other healthcare personnel and as such interventional measures may be designed around them.

The WHO has recommended guidelines [2,30], for hand hygiene and its central theme is to wash hands with soap and water when it is visibly dirty or soiled with blood or other body



fluids or after toilet use. The guidelines recommend washing with water and soap or an alcohol-based hand rub. Studies on efficacy of alcohol-based hand rub show that they have good efficacy when the concentration of alcohol ranges from 62% to 95% thus ensuring that they are rapidly bactericidal [32].

Promoting the use of alcohol-based hand rubs in hospital in developing countries such as ours may help drive down the rates of HAI as running water is not always available. Such alcohol-based hand rubs can be constituted in local pharmacies and made available on a regular basis for hospital use.

Conclusion

This study established that the participants have good knowledge of hand hygiene but compliance needs to be improved upon. The main identified limitations are non availability of hand washing kits; soap, running tap water, alcohol rub, and towel or hand dryers.

We recommend the provision of these basic needs as well educational sessions to further drive the importance of hand washing to the care givers and patients which will go a long way in improving their attitude towards hand hygiene. This we believe would curb preventable infections, reducing hospital stay and cost.

Therefore, information, education, and communication should be intensified among HCW in clinical settings to reduce HAI.

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