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Original Research Article

Knowledge, attitude and practice of hand hygiene among healthcare providers in semi-urban communities of Sokoto State, Nigeria

ABSTRACT

Introduction: Healthcare providers have been identified as the most common vehicle for transmission of HAIs from patient to patient and within the healthcare environment. A large proportion of the infections acquired in the hospital is attributed to cross contamination and transmission of microbes from hands of HCPs to patients. Hand hygiene has been identified as the single most important, simplest and least expensive means of preventing HAIs. This study aimed to determine the knowledge, attitude and practice of hand hygiene among healthcare providers in semi-urban communities of Sokoto State, Nigeria

Methods: A cross-sectional study was conducted among 144 healthcare providers selected by a multistage sampling technique. Data was collected with a set of pretested self- and interviewer-administered, semi-structured questionnaire. Data were analyzed using IBM SPSS version 20 statistical package.

Results: The mean age of the respondents was 32.1 ± 7.4 years, and majority of them were aged 20 – 39 years (81.2%), females (59.0%) and married (65.3%). Most of the respondents (71.5%) were community health extension workers (CHEWs) and nurses/midwives. One hundred and thirty-two (91.7%) of the 144 respondents had good knowledge of hand hygiene; but about a third of respondents (31.9%) had the misconception that hand washing should be done before touching patients' files. Most of the respondents demonstrated positive attitude to hand hygiene. Most of them would attend workshop/training on hand hygiene (95.1%), and would advise their colleagues to do so (94.4%). One hundred and thirty-nine (96.5%) of the 144 respondents reported observing hand hygiene practices; of these, only two-thirds, 97 (69.8%) do so consistently. The main reasons cited for not observing hand hygiene practices consistently were unavailability of soap (88.1%) and irregular water supply (51.0%).

Conclusion: Although, knowledge, attitude and practice of hand hygiene were good among the respondents in this study, unavailability of soap and lack of constant water supply remain major constraints. Government and other stakeholders should provide adequate water, and materials for sanitation and hygiene in the healthcare facilities.

Keywords: Knowledge, attitude, practice, hand hygiene, healthcare providers

1. INTRODUCTION

Considering the tremendous advancement in medical care in the past few decades, it is strange that the health-care settings still remain unsafe for patients worldwide, principally as a result of hospital acquired infections (HAIs)[1]. Healthcare providers have been identified

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as the most common vehicle for transmission of HAIs from patient to patient and within the healthcare environment [2]. A large proportion of the infections acquired in the hospital is attributed to cross contamination and transmission of microbes from hands of HCPs to patients [3]. Numerous infections are still acquired from both patients and HCPs through poor hand hygiene, unsafe use of injections, medical devices and blood products, inadequate surgical procedures and deficiencies in medical waste disposal [4]. In addition to these factors, an unfavorable social background and population largely affected by malnutrition and other types of infection and/or disease contribute to the increased risk of HAIs in developing countries [5].

Multidrug– Resistant pathogens are commonly involved in such infections and render effective treatment difficult [6]. Prevalence studies of HAIs in developing countries have reported higher rates than developed countries [7]. The total number of hand exposures in a hospital may range from several tens to thousands per day [7]. With each hand-to-surface exposure, a two directional exchange of microorganisms occurs between hands and the touched object and the transient hand-carried flora is thus continuously changing [8]. It has also been found that a substantial proportion of the healthcare workers' hand flora gradually gets replaced by pathogenic microorganisms, which can spread throughout a health care environment in a short span of time [8].

Hospital acquired infections poses a very real and serious threat to all who are admitted in hospitals [9]. According to the World Health Organization, HAI affects an estimated 1.4 million patients at any time worldwide [10]. Hand hygiene has been identified as the single most important, simplest and least expensive means of preventing HAIs [6]. It is the practice which keeps the hands free from pathogens, or decreases the quantity of pathogen, prior to any procedure or touching the patient [11].

Evidence from studies has shown that improved hand hygiene has substantially reduced noso-comial infections and cross-contamination of multi resistant infection in hospitals [3]. It has also been shown to be associated with significant decrease in overall rates of HAIs and respiratory infections in particular [12]. Hand hygiene in the health care setting has been encouraged for generations and is recommended as the single most important procedure for preventing the transmission of infection [8]. Specifically, hand washing is recommended before and after every contact with patient to break the chain of infection [13]. Even though evidenced based guidelines for HCPs hand hygiene practices exist in many healthcare facilities, compliance with these are internationally low [14]; hand hygiene compliance rates among HCPs rarely exceeds 50% [9].

While lack of awareness and scientific knowledge regarding hand hygiene is believed to be a significant factor that could lead to inappropriate hand hygiene practices [15], misconceptions regarding hand hygiene are believed to contribute to low compliance; for instance, when gloves are used as an alternative to hand hygiene, or the notion that skin irritation arises from frequent hand hygiene practice [16]. Other factors that have been found to contribute to poor hand hygiene practices in the healthcare settings include increased workloads due to under-staffing, lack of organizational commitment to good hand hygiene practices, and inadequate or lack of hand hygiene products and facilities such as running water, sinks, antiseptic or non-antiseptic soaps, alcohol hand-rubs and hand paper towels [17]. It has been found that most wards in Nigerian hospitals lack adequate facilities for effective hand hygiene and use the bucket and bowl method as an alternative to running water [18].

Variations in the practice of hand hygiene across hospital wards and among different cadres of HCPs have been associated with good knowledge of hand hygiene, and it is believed that targeted educational programs may be useful in improving appropriate hand hygiene practices [19]. While previous studies across the globe including Nigeria and Egypt reported positive attitude towards hand hygiene by an overwhelming majority of healthcare providers [12,20], widely varied and lower proportions of healthcare providers showed good knowledge of hand hygiene [21,22], and/or engaged in appropriate hand hygiene practices [13,23]. This

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study was conducted to assess the knowledge, attitude and practice of hand hygiene among healthcare providers in semi-urban communities of Sokoto State, Nigeria. The findings would be invaluable in designing strategies for promoting compliance with appropriate hand hygiene practices among healthcare providers; and in preventing HAIs in the healthcare facilities.

2. MATERIAL AND METHODS

This cross-sectional descriptive study was carried out among health care providers in health facilities in Wamakko Local Government Area (LGA) of Sokoto state, Nigeria in November and December 2016. All healthcare providers in the government owned health facilities in Wamakko LGA were considered eligible for enrollment into the study. The sample size was estimated at 144 using the Fisher's formula for calculating the sample size for descriptive studies [24], a 91.0% prevalence of knowledge of good practice of hand hygiene from a previous study [12], precision level of 5%, and an anticipated 95% response rate. The eligible participants were selected by a 2-stage sampling technique. At the first stage, one health facility was selected from each of the 11 political wards in Wamakko LGA by simple random sampling using the balloting option. At the second stage, eligible participants were selected in each of the selected health facilities (in direct proportion to the number of staff in the respective health facilities) by systematic sampling technique using the staff list in the respective health facilities to constitute the sampling frame.

A semi-structured, self- and interviewer-administered questionnaire was developed and used to obtain information on respondent's socio-demographic characteristics, knowledge, attitude and practice of hand hygiene. The questionnaire was reviewed by senior researchers in the department to ascertain content validity. It was then pretested among 15 healthcare providers at Yar-Akija Primary Healthcare Centre, Sokoto South LGA of Sokoto. Some questions were rephrased for clarity based on the observations made during the pretesting. Four final year medical students and two medical records staff assisted in questionnaire administration after pre-training on conduct of survey research, the objectives, and questionnaire administration. Ethical clearance was obtained from the Ethical committee of Sokoto State Ministry of Health, Sokoto, Nigeria. Permission to conduct the study was obtained from the administration of Wamakko LGA, while informed written consent was also obtained from the participants before data collection.

Data was analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 20. Respondents' knowledge of hand hygiene was scored and graded on a 13-point scale. One point was awarded for a correct response, while a wrong response or a non-response received no points. This gives a minimum score of '0' and a maximum score of '13' points. Those that scored $\geq$ 7 of 13 points were considered as having 'good' knowledge, while those that scored < 7 of 13 points were graded as having 'poor' knowledge. Frequency runs were done for further editing and cleansing of the e-data. Frequency distribution tables were constructed; and cross tabulations were done to examine relationship between categorical variables. Chi-square and Fisher's exact tests of independent association was used to test for relationship between categorical variables. All levels of significance were set at $p < 0.05$.

3. RESULTS

3.1 Socio-demographic characteristics of respondents

All the 144 questionnaires administered were retrieved and analyzed. The ages of the respondents ranged from 18 to 57 years (mean = 32.1 $\pm$ 7.4 years), and majority of them were aged 20 – 39 years (81.2%), females (59.0%) and married (65.3%). Most of the respondents were Muslims (77.1%), community health extension workers (CHEWS) and

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nurses/midwives (71.5%), and majority of respondents have practiced for 5 years and above (55.6%) as shown in Table 1.

3.2 Respondents' knowledge of hand hygiene

One hundred and thirty-two (91.7%) of the 144 respondents had good knowledge of hand hygiene. A majority of the respondents (74.3%) knew hand hygiene to mean washing hand with soap and water or sanitizer before and after touching a patient; and most of them (89.6%) knew that it should be done consistently. Majority of respondents knew the materials needed for hand hygiene and the moments to observe it. However, about a third of respondents (31.9%) had the misconception that hand washing should be done before touching patients' files. Most of the respondents also knew the hazards of a contaminated hand (93.1%) and the benefits of observing proper hand hygiene (97.9%) as shown in Table 2. There was no association between good knowledge of hand hygiene and any of the respondents' socio-demographic variables.

3.3 Respondents' attitude to hand hygiene

Most of the respondents demonstrated positive attitude to hand hygiene. Most of them would attend workshop/training on hand hygiene (95.1%), and would advise their colleagues to do so (94.4%). Most of them believed it is important to observe hand hygiene before and after touching a patient (93.1%), and would advise their colleagues to observe same (93.1%). Majority of respondents (65.3%) believed there is need to wash hand with soap and water even if one has used a sanitizer (Table 3).

3.4 Respondents' hand hygiene practices

One hundred and thirty-nine (96.5%) of the 144 respondents reported observing hand hygiene practices; of these, only two-thirds, 97 (69.8%) do so consistently. Majority of respondents (87.8%) reported observing hand hygiene practices before and after attending to patients; and the most commonly used materials were soap, water and sanitizers (71.3%). Although, less than a half of the respondents (44.6%) observe hand hygiene practices before putting on gloves, most of them (93.5%) do so after removing gloves (Table 4). The main reasons cited for not observing hand hygiene practices consistently were unavailability of soap (88.1%) and irregular water supply (51.0%) as shown in Table 5.

4. DISCUSSION

The respondents in this study were of a relatively young population with a mean age of 32.1 $\pm$ 7.4 years, and majority of them (81.2%) were between the ages of 20 and 39 years. This could be due to the fact that close to half of them (44.4%) were newly recruited and have spent less than 5 years in service. While this compares well with the age distribution of respondents in a study conducted in Nigeria [12], in which majority of respondents were aged 25 to 34 years with a mean age of 31.3 $\pm$ 6.8 years, it differs from the finding in another study conducted in Ghana, that reported a much younger population, with majority of respondents between the ages of 20 and 29 years [23].

Majority of the respondents in this study (59.0%) were females, this could due to the fact that community health extension workers (CHEW), and nurses/midwives constitute a majority of respondents (71.5%), and these professions are generally considered to be women professions. Most of the respondents in this study (91.7%) demonstrated good knowledge of hand hygiene. This finding is in consonant with the findings in studies conducted in Lagos University Teaching Hospital, Lagos, Nigeria, and a Multispecialty Hospital in India that reported 91.2% and 90.0% prevalence of good knowledge of hand hygiene respectively. On

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the contrary, AbdElaziz et al [20], and Balafama et al [21] reported lower prevalence rates of 73.1% and 44.6% respectively.

Most of the respondents in this study showed positive attitude towards hand hygiene as they were willing to attend training workshop on hand hygiene (95.1%), and also encourage their colleagues to do so (94.4%). They also considered observing hand hygiene before and after touching a patient to be important (93.1%) and would advice their colleagues to do so (93.1%). These findings compare well with the findings in studies conducted in Nigeria, Egypt and Italy, that reported 96.7%, 96.0% and 86.2% prevalence of positive attitude towards hand hygiene respectively [10,12,20].

Although, an overwhelming majority of the respondents in this study (96.5%) observed hand hygiene practices, only about two-thirds (69.8%) do so consistently. However, this is substantially higher than the 67% and 62.5% prevalence of compliance with hand hygiene practices reported in studies conducted in Ghana and UK respectively. The barriers to compliance with good hand hygiene practices included unavailability of soap (88.1%), and lack of constant water supply (51.0%). Similar obstacles to the practice of hand hygiene were also reported in a study conducted in Ghana [23]. These findings corroborate the submission by the World Health Organization on the appalling state of water, sanitation and hygiene (WASH) services in health care facilities in low- and middle income countries [25], and they re-emphasizes the need for governments and other stakeholders to make provision of adequate water and materials for sanitation and hygiene in the health care facilities a top priority.

5. Conclusion

Although, knowledge, attitude and practice of hand hygiene was good among the respondents in this study, unavailability of soap and lack of constant water supply remain major constraints. Government and other stakeholders should provide adequate water, and materials for sanitation and hygiene in the healthcare facilities.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Tables

Table 1 : Socio-demographic characteristics of respondents
Table 2 : Respondents' knowledge of hand hygiene
Table 3 : Respondents' attitude to hand hygiene
Table 4 : Respondents' hand hygiene practices
Table 5 : Reasons for not observing hand hygiene practices consistently

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (%) (n = 144)
Age group (in years)	
Below 20	3 (2.1)
20 -29	53 (36.8)
30-39	64 (44.4)
40-49	20 (13.9)
50 and above	4 (2.8)
Sex	
Male	59 (41.0)
Female	85 (59.0)
Marital status	
Single	41 (28.5)
Married	94 (65.3)
Separated	5 (3.5)
Widowed	4 (2.8)
Religion	
Islam	111 (77.1)
Christianity	33 (22.9)
Cadre	
Doctor	19 (13.2)
Nurse/Midwife	49 (34.0)
Laboratory scientist	14 (9.7)
Community Health Extension Worker	54 (37.5)
Pharmacist	8 (5.6)
Working experience (in years)	
Below 5 years	64 (44.4)
5 years and above	80 (55.6)

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Table 2: Respondents' knowledge of hand hygiene

Variables	Correct response Frequency (%) (n = 144)
Meaning of hand hygiene	
Wash hand with soap and water or sanitizer before and after touching a patient	107 (74.3)
When to observe hand hygiene	
Always before and after touching a patient	129 (89.6)
Materials that are needed for hand hygiene	
Constant water supply	
Soap	95 (66.0)
Hand sanitizer	140 (97.2)
Hand gloves	123 (85.4)
	124 (86.1)
Moments to observe hand washing	
Before touching a patient	131 (91.0)
After body fluid exposure risk	131 (91.0)
After touching a patient	135 (93.8)
Before touching patient files	46 (31.9)
After touching patient surrounding	137 (95.1)
Contaminated hand can be a vehicle for transmitting infection between healthcare providers to patients	134 (93.1)
Proper hand hygiene can protect both the healthcare provider and the patient from contracting disease	141 (97.9)
Knowledge grade	**Frequency (%)**
Good	132 (91.7)
Poor	12 (8.3)

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Table 3: Respondents' attitude to hand hygiene

Variables	Frequency (%) (n = 144)
Would attend a workshop/training on hand hygiene if invited	137 (95.1)
Would advise colleagues to attend workshop/training on hand hygiene if invited	136 (94.4)
Believed it is important to observe hand hygiene before and after touching a patient	134 (93.1)
Would advise colleagues to observe hand hygiene before and after touching a patient	134 (93.1)
Believed there is need to wash hand with soap and water even if one has used a sanitizer	94 (65.3)

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Table 4: Respondents' hand hygiene practices

Variables	Frequency (%)
Observe hand hygiene practices while attending to patients (n = 144)	
Yes	139 (96.5)
No	5 (3.5)
How often hand hygiene is observed (n = 139)	
Always	97 (69.8)
Occasionally	42 (30.2)
When hand hygiene is observed (n = 139)	
Before attending to patient only	8 (5.8)
After attending to patient only	9 (6.4)
Before and after attending to patient	122 (87.8)
Materials used for hand hygiene (n = 139)	
Water only	2 (1.4)
Water and soap	21 (15.1)
Hand sanitizer only	17 (12.2)
Water, soap and sanitizer	99 (71.3)
Observe hand hygiene before putting on gloves (n = 139)	
Yes	62 (44.6)
No	77 (55.2)
Observe hand hygiene after removing gloves (n = 139)	
Yes	130 (93.5)
No	9 (6.5)

Table 5: Reasons for not observing hand hygiene practices consistently

*Reason(s)	Frequency (%) (n = 42)
Irregular water supply	20 (51.0)
Inconveniently located sink	11 (26.2)
Unavailability of hand sanitizer	17 (40.5)
Unavailability of soap	37 (88.1)

*Multiple responses allowed