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Knowledge Gap and Poor Satisfaction as Barriers to Hand Hygiene in a Teaching Hospital in South-South Nigeria

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Abstract: Health care associated infection remains a global problem and hand hygiene has been identified as an effective strategy for its control. Adherence to hand hygiene among healthcare workers, however, is low across the world. The aim of this study was to determine the level of knowledge of hand hygiene among healthcare workers and identify reasons for poor hand hygiene practice in our hospital. A 19-point questionnaire was administered to available health workers in February 2018 to assess availability of hand hygiene materials, frequency of performing hand hygiene, satisfaction with hand hygiene materials, and knowledge of infection transmission dynamics, efficacy and proper use of hand hygiene methods. Eighty-five healthcare workers participated in this study. Mean knowledge score of participants was 37.87 ± 13.45. Most participants reported performing hand hygiene up to 90% of the time and there were high rates of dissatisfaction among participants with hand hygiene products and their availability. This study shows that there is poor knowledge of some aspects of hand hygiene among healthcare workers in our hospital and there is general dissatisfaction with current hand hygiene products.

Keywords: Hand Hygiene, Knowledge, Satisfaction, Nigeria

1. Introduction

Hand hygiene, defined as either washing the hands with soap and water or hand antisepsis with an alcohol-based hand-rub, [1] has been described as the single most important practice to reduce the transmission of infectious agents in healthcare settings. [2] In hospitals, spread of infectious agents occur mainly through hands of caregivers. [3] Historically, institution of handwashing was associated with reduced incidence of puerperal sepsis in a maternity ward. [4] Healthcare associated infections (HAI) are responsible for thousands of deaths worldwide every year. In developed countries HAI affects from 5% to 15% of hospitalized patients in regular wards and as many as 50% or more of patients in intensive care units (ICUs) while in developing countries, the magnitude of the problem remains underestimated or even unknown largely because HAI diagnosis is complex and surveillance activities to guide interventions require expertise and resources. [5] The pooled prevalence in mixed patient populations of HAI in low- and middle-income countries was found to range from 10.1% to 15.5%. [6]

In spite of this, studies continue to show that rates of adherence to hand hygiene among healthcare workers is low. [2, 7–9] One major reason for low adherence levels is poor knowledge among healthcare workers of risks and procedures. [10] Raising the level of knowledge of healthcare workers on transmission of infection and hand hygiene can be seen as a first step towards improving practice in this regard. [11] Consequently, education and training are recommended because they promote adherence. [12, 13]

Lack of appropriate equipment has also been identified as another major obstacle to adherence with hand hygiene measures among healthcare workers [10, 14] especially in resource limited settings. In Italy, availability of hand hygiene products in wards was found to be associated with increased hand hygiene compliance. [15] Increasing

availability of Alcohol Hand Sanitizers has also been noted to have the potential to address other barriers to hand hygiene. [14].

We conducted this survey to determine the level of knowledge of hand hygiene among healthcare workers and identify reasons for poor hand hygiene practice in our hospital in preparation for the introduction of a locally produced hand sanitizer to promote hand hygiene.

2. Methods

2.1. Study Design and Study Area

This was a cross sectional survey conducted at a 500-bed tertiary hospital serving a population of about five million people in Akwa Ibom and neighbouring states in Southern Nigeria. The staff strength of this facility includes 450 nurses and 420 doctors.

2.2. Study Instrument and Study Participants

The study instrument was a structured self-administered 19-point questionnaire which was adapted from the WHO "Saves Lives" Hand Hygiene Knowledge Questionnaire for Healthcare Workers (2009). It was administered to all health workers available in the main wards of the hospital in the month of February 2018. Questions covered availability of hand hygiene materials, frequency of performing hand hygiene, satisfaction with hand hygiene materials, and knowledge of infection transmission dynamics, efficacy and proper use of hand hygiene methods.

2.3. Data Analysis

Knowledge questions were structured as best answer questions or true/false (or yes/no) questions. For each correct answer, one point was awarded and overall scores were expressed in percentage. Satisfaction questions were graded on a scale of 1-10 and recoded as 1-3 not satisfied, 4-6 neither satisfied nor dissatisfied and 7-10 dissatisfied. Data was entered and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 22 and summarized using proportions/percentages and presented using frequency tables.

2.4. Ethical Considerations

Informed consent was obtained from participants. Ethical approval was not sought as hospital patients were not included in this study.

3. Results

3.1. Participants

Eighty-five healthcare workers participated in this study most of whom were female nurses (87.1%). Their departments are shown in figure 1. Majority of respondents (88.2%) reported having received previous training on hand hygiene.

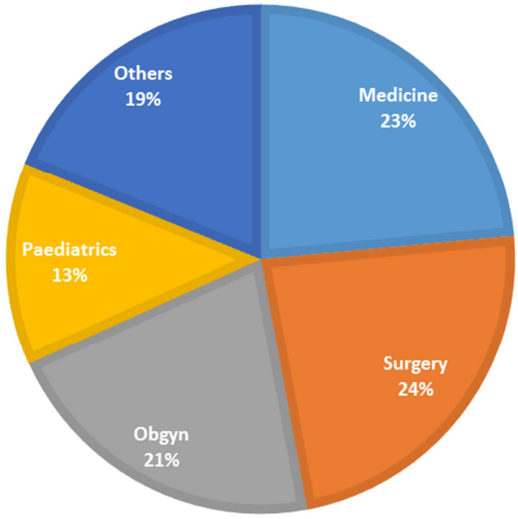

Figure 1. *Department of study participants.*

3.2. Knowledge

The scores of participants ranged from 3.23% to 70.97% with a mean score of 37.87 ± 13.45 and a median score of 38.70 (Table 1). The knowledge of transmission of infectious agents was generally low particularly the question about the most common source of germs associated with healthcare-associated infections. Knowledge of hand hygiene had relatively higher scores but there were some questions with low rate of correct answers. Among the questions on selection of hand hygiene products, only two had rate of correct answers above 50%.

Table 1. *Hand hygiene Knowledge scores of participants by section.*

Statistic	Total score	Transmission of infectious agents	Hand hygiene	Selection of appropriate hand hygiene product
Mean	38.33	28.57	57.58	27.38
Median	38.71	33.33	63.64	28.57
Std. Deviation	12.87	14.77	23.84	14.91
Minimum	3.23	0.00	9.09	0.00
Maximum	70.97	66.67	90.91	64.29

3.3. Practice

Majority of participants (58.8%) reported performing hand hygiene up to 90% of the time after touching contaminated surfaces (Table 2). The major reasons for not performing hand hygiene reported by participants were "Alcohol hand rub is not usually available" (49.4%), "Heavy workload"

(24.7%) and "Already used gloves" (8.2%) (Table 3). Majority of participants (56.5%) agreed that introduction of sanctions would increase compliance with hand hygiene.

Table 2. *Frequency of Cleaning Hand.*

Frequency of hand hygiene	No (%)
25%	3 (3.5)
50%	6 (7.1)
75%	18 (21.2)
90%	50 (58.8)
100%	8 (9.4)

Table 3. *Major reasons for non-performance of hand hygiene by participants.*

Reason	No. (%)
Alcohol hand rub is not usually available	42 (49.4)
Heavy workload (too busy)	21 (24.7)
Hand rubs are poorly located	6 (7.1)
Hands don't look dirty	2 (2.4)

3.4. Satisfaction Survey

There were high rates of dissatisfaction among participants with 66.7% dissatisfied with hand hygiene products and 77.4% dissatisfied with availability of hand hygiene products (table 4). The most commonly available hand hygiene products according to participants were non-antibacterial soap (32.9%), alcohol hand rub carried by individuals (24.7%) and antibacterial soap (17.7%) (Table 5).

Table 4. *Satisfaction of participants with hand hygiene products and availability.*

	Satisfaction with products	Satisfaction with availability
	NO. (%)	NO. (%)
Yes	5 (6.0)	3 (3.6)
Neither satisfied nor dissatisfied	20 (23.8)	14 (16.7)
No	56 (66.7)	65 (77.4)
No response	3 (3.6)	2 (2.4)

Table 5. *Available hand hygiene products reported by participants.*

Product	No. (%)
Non-Antibacterial Soap	28 (32.9)
Individual Alcohol hand rub	21 (24.7)
Antibacterial soap	15 (17.7)
Hand lotion	10 (11.8)
Alcohol hand rub	(4.7)

4. Discussion

In this study, we found that knowledge of healthcare workers varied in different aspects of hand hygiene. While knowledge on general hand hygiene was fair, knowledge of transmission of infections and selection of hand hygiene was much lower. This finding highlights the tilted nature of hand hygiene trainings which focus more on performance but fail to address the science underlying hand hygiene practice. Among healthcare workers, these gaps in knowledge could lead to lower compliance with hand hygiene protocol as lack of scientific information of definitive impact of improved hand hygiene on health-care–associated infection rates has been found to be a factor associated with poor adherence to hand hygiene guidelines. [16] One possible consequence of poor understanding of the rationale for hand hygiene is the finding from several studies that more healthcare workers perform hand hygiene after patient contact than before patient contact. [9, 17–19]

Participants in this study also performed poorly in selection of proper hand hygiene methods for different situations. Different modalities for hand hygiene viz hand washing and hand rubbing are appropriate in different situations and healthcare workers' ability to select the correct method for each situation is key to effective hand hygiene.

Although most participants reported high levels of compliance with hand hygiene, it has been found that in surveys of healthcare personnel, self-reported adherence are usually generally higher than that reported in observational studies. [12] Moreover, healthcare workers perception of their compliance being better than it actually is, has been identified as a barrier to hand hygiene compliance among physicians. [20]

In this study we found low satisfaction with hand hygiene materials available in the hospital. Alcohol hand rubs and antibacterial soap were reported to be less available than non-antibacterial soaps. It is well established that alcohol-based hand rubs are the most efficacious agents for reducing the number of bacteria on the hands of personnel, followed by antiseptic soaps and detergents, and non-antimicrobial soaps are the least effective. [2] Alcohol hand rub are largely unavailable in most hospitals in Nigeria due to cost constraints. A recent development looking to mitigate this in Nigeria is in-house production of alcohol-based hand sanitizers. [21] This has the potential to reduce cost and improve availability of hand hygiene materials.

A slight majority of participants in this study were in favour of the use of sanctions and rewards to improve compliance with hand hygiene in the hospital. Administrative sanctions for non-compliance together with rewards for compliance is one of the newer strategies for improving adherence to hand hygiene. [22] The absence of these sanctions and incentives may pose a barrier to appropriate hand hygiene. [2, 18]

5. Conclusion

This study shows that there is deficiency in knowledge in certain areas of hand hygiene among healthcare workers in our hospital. There is also general dissatisfaction with current hand hygiene products. This justifies the need for the intended introduction of locally produced hand sanitizer which will be more available due to reduced cost.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest.

Contribution of the Author

AEE was involved in the concept and design of the study, data acquisition and analysis and drafting of manuscript. OBM was involved in design of the study, data analysis revision of manuscript. NFI was involved in the concept and design of the study and revision of manuscript.

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