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## HAND HYGIENE AMONGST DENTAL PROFESSIONALS IN A TERTIARY DENTAL CLINIC

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**Running title:** Hand hygiene among dental professionals.

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### ABSTRACT

**Objective:** To evaluate hand washing attitude and practices among Dentists and Dental Students treating patients in a Nigerian Tertiary Dental Clinic.

**Materials and Methods:** A cross-sectional survey of Dentists and Dental Students treating patients in University of Benin Teaching Hospital was conducted between February and March 2010. Data collection tool was a 28-item, self-administered questionnaire, which elicited information on demography, handwashing practices, material used for handwashing, methods of drying hands after washing, attitudes towards prevention of spread of infection by handwashing measures in dental practice, barrier to regular hand washing, information need on handwashing and mode in which they would desire to receive the needed information.

**Results:** One-quarter (25.7%) of the respondents washes their hands before wearing gloves and 98.1% wash their hands when they are visibly soiled. Less than half (46.7%) washed their hand when the worn gloves are torn. Majority strongly agreed that hand washing helps to prevent transmission of infection to patients (91.4%), health workers (92.4%) and health workers family members (89.5%). The main barriers to regular hand hygiene were inadequate facilities, forgetfulness and lack of time. About 69.5% desired more information on hand hygiene with the most indicated area of information needs being the indications and steps in hand washing in form of seminars and pamphlets.

**Conclusion:** This study revealed positive attitude to hand washing, inadequate hand washing practices and poor monitoring of hand hygiene in the health institution. The studied dental professionals however know that hand washing plays an important role in the prevention of cross infection.

**Keywords:** hand hygiene, dental professionals, tertiary, dental clinic, infection control

### INTRODUCTION

Direct contact transmission is one of the most frequent means of transmission of infectious diseases in healthcare setting worldwide (1). The role of a health worker's contaminated hand in this form of infection transmission was recognized since the mid-1800s by Ignaz Semmelweis in Vienna, Austria and Oliver Wendell Holmes in Boston, USA (2, 3). Health care workers' hands get contaminated by touching body secretions, excretions, wounds of patients, intact skin of patients and environmental surfaces in the immediate vicinity of the patients (4). To avoid prolonged hand contamination, it is important to perform hand hygiene.

Hand hygiene is the single, most critical measure for reducing the risk of transmitting organisms to patients and health care providers. It has been cited as the most effective measure for preventing healthcare associated infections, and its impact on the reduction of these infections is estimated at 50% (5). The value of hand hygiene extends beyond health care setting as it helps in preventing chemically related occupational hazards and up to 80% of infections, including influenza, in the community setting (6). Hand hygiene compliance among health care workers is low

despite the fact that hand hygiene is one of the simplest and most important aspects of infection control<sup>7</sup>. Noncompliance with hand hygiene practices is associated with health care-associated infections, the spread of multi-resistant organisms, and has been a major contributor to outbreaks of infectious diseases.

Hand hygiene is very important in dentistry because of the ease of contamination of hands by blood, body fluids and saliva. The Centers for Disease Control (CDC) in 2003 guidelines for infection control in dentistry listed the specific instances when hand hygiene should take place (8). Studies on hand hygiene have been conducted on different groups of health workers including dental professionals in different parts of the world (9-18). To the best knowledge of researchers, none of such study on Nigerian dental professional exists in indexed literature.

The objective of the study was to evaluate attitude to and practices of hand washing among Dentists and Dental Students treating patients in a Nigerian Tertiary Dental Clinic.

## MATERIAL AND METHODS

This survey was conducted between February and March 2010 at the Dental clinic of the University of Benin Teaching Hospital. University of Benin Teaching Hospital is located in Ugbowo, Benin City, capital of Edo State, Nigeria. It was established in 1973 as the sixth 1<sup>st</sup> generation Teaching Hospitals in Nigeria. The study population was Dentists and Dental Students treating patients who attend the University of Benin Teaching Hospital dental clinic. Data collection tool was a 28-item, self-administered questionnaire, which elicited information on demography, hand washing practices, materials used for hand washing, methods of drying hands after washing, attitudes towards prevention of spread of infection by hand hygiene measures in dental practice, barrier to regular hand washing, information need on hand washing and mode in which they would desire to receive the needed information. Informed consent was obtained from participants after educating them on the study and its objectives. Ethical approval for the study was obtained from the University of Benin Teaching Hospital Ethics and Research Committee. The collated data was analyzed with SPSS version 15.0 and chi square was used to test for statistical significance which was set at  $p < 0.05$ .

## RESULTS

Majority (87.6%) of the respondents were in 21-30 year age group. Two-thirds of the respondents were male. Only 16.2% were married. About one-third (32.4%) of the respondents were of Bini tribe. Three-tenth (30.5%) of the respondents were Dentists. A total of 16 (15.2%) of the respondents wear ring of which 11 (10.5%) were smooth in nature while the remaining 5 (4.8%) were serrated in nature (**Table 1**).

**TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS**

Characteristics	Frequency	Percent
<b>Age (years)</b>		
21-30	92	87.6
31-40	12	11.4
>50	1	1.0
<b>Sex</b>		
Male	70	66.7
Female	35	33.3
<b>Marital Status</b>		
Single	88	83.8
Married	17	16.2
<b>Religion</b>		
Christianity	101	96.2
Islam	2	1.9
Trad religion	2	1.9
<b>Tribe</b>		
Bini	34	32.4
Esan	18	17.1
Igbo	16	15.2
Yoruba	9	8.6
Urhobo	9	8.6
Etsako	6	5.7
Isoko	4	3.8
Igala	3	2.9
Others	6	5.7
<b>Status</b>		
Dentist	32	30.5
Dental student	73	69.5
<b>Ring</b>		
Smooth ring	11	10.5
Serrated ring	5	4.8
No ring	89	84.8
<b>Total</b>	<b>105</b>	<b>100</b>

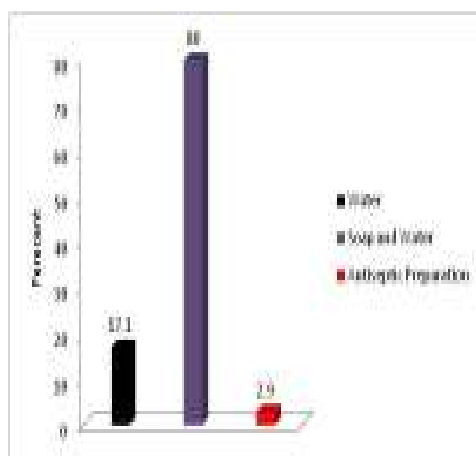
Majority (93.3%) of the respondents reported that hand washing is important in dentistry. One-quarter (25.7%) of the respondents wash their hands before wearing gloves. Almost all the respondents (98.1%) wash their hands when they are visibly soiled. Less than half (46.7%) wash their hand, after removing torn gloves, before re-gloving (**Table 2**). There was no significant difference in the handwashing practices of dentists and dental students in this study ( $P > 0.05$ ).

Majority (80%) of the respondents wash their hand regularly with soap and water (**Figure 1**).

**TABLE 2: HAND WASHING PRACTICES AMONG THE RESPONDENTS**

Practice	Yes	No	No response
Before gloving	27 (25.7%)	78 (74.3%)	0 (0%)
After gloving	91 (86.7%)	13 (12.4%)	1 (1.0%)
Torn glove	49 (46.7%)	53 (50.5%)	3 (2.9%)
Before leaving Operatory	69 (65.7%)	36 (34.3%)	0 (0%)
Contaminated hand	93 (88.6%)	12 (11.4%)	0 (0%)
Visibly soiled hand	103 (98.1%)	2 (1.9%)	0 (0%)
Before lunch	57 (54.3%)	44 (41.9%)	4 (3.8%)
After using restroom	83 (79.0%)	20 (19.0%)	2 (1.9%)

**FIGURE 1: MATERIALS UTILIZED BY RESPONDENTS FOR HAND WASHING**

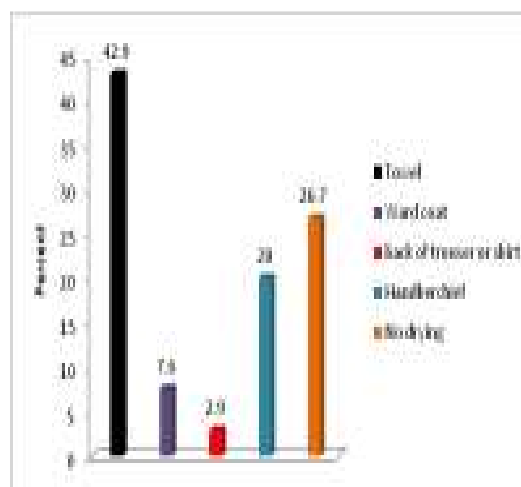


Drying of washed hands is done using hand towel by 42.9% of the respondents. One-fifth (20%) of the respondents dry their hand using a personal handkerchief. More than one-quarter (26.7%) do not dry their hands after washing (Figure 2).

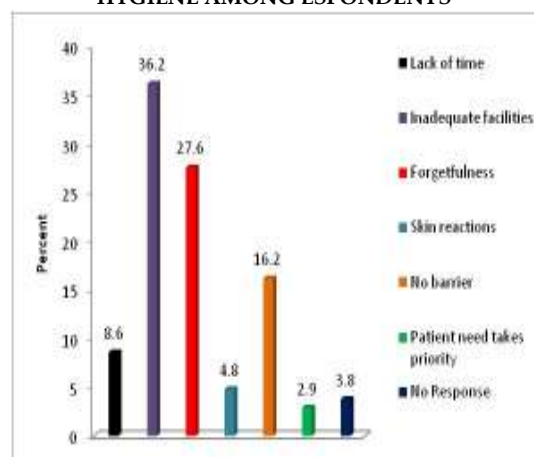
Majority (91.4%, 92.4% and 89.5%) of the respondents strongly agreed that hand washing helps to prevent spread of infection to the patients, health workers and family of health worker respectively (Table 3).

The identified barriers to regular hand hygiene among the respondent were inadequate facilities, forgetfulness and lack of time (Figure 3).

**FIGURE 2: WAYS OF DRYING HANDS AFTER WASHING AMONG THE RESPONDENTS**



**FIGURE 3: BARRIERS TO REGULAR HAND HYGIENE AMONG ESPONDENTS**

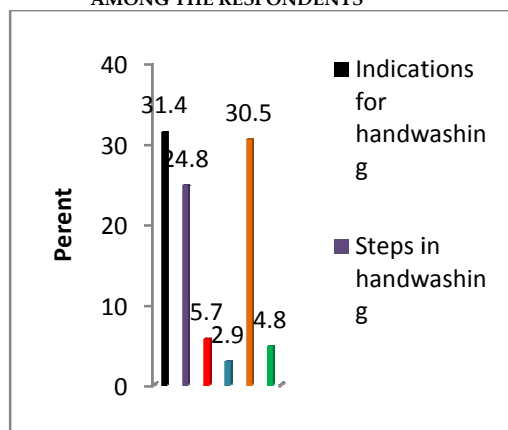


**TABLE 3: ATTITUDE OF THE RESPONDENTS ON THE PREVENTION OF SPREAD OF INFECTION BY HAND WASHING**

Questions	STA	SOA	UNS	SOD	STD	NOR
Hand washing helps to prevent the spread of infection to patients?	96(91.4%)	8(7.6%)	0(0%)	0(0%)	0(0%)	1(1.0%)
Hand washing helps to prevent the spread of infection to family of health worker?	94(89.5%)	8(7.6%)	1(1.0%)	0(0%)	1(1.0%)	1(1.0%)
Hand washing helps to prevent the spread of infection to health worker?	7(92.4%)	5(4.8%)	2(1.9%)	0(0%)	0(0%)	1(1.0%)
My institution monitors hand washing?	7(6.7%)	9(8.6%)	28(26.7%)	16(15.2%)	43(41%)	2(1.9%)

Key to the table: STA-Strongly Agree, SOA - Somewhat Agree, UNS-Unsure, SOD - Somewhat Disagree, STD-Strongly Disagree, NOR- No Response

FIGURE 4: INFORMATION NEEDS ON HAND HYGIENE AMONG THE RESPONDENTS



## DISCUSSION

Hand hygiene is critical in the prevention of hospital-acquired infections which contribute to the death of nearly 90,000 hospital patients per year and \$4.5 billion in medical expenses (19). Hand washing is also the single most effective way to reduce the spread of microorganisms in dentistry (8). In this study, majority of the respondents (93.3%) knew that hand washing is important in dentistry. This high percentage is encouraging and it may imply that many of the respondents will be willing to carry out hand hygiene in their practice. Wearing of rings can increase the possibility for hand contamination in dental and medical settings. The skin of hospital personnel underneath rings is more heavily colonized than comparable areas of skin on fingers without rings (8,20,21). The presence of ring impedes the removal of microorganisms by routine hand hygiene, resulting in prolonged and persistent periods of microbial contamination (8,22). A total of 16 respondents (15.2%) wear rings at work, 10.5% of which are smooth nature and 4.8% serrated in nature. These group of people may not be able to achieve optimal hand hygiene since difficulty of gloving and the high rate of glove tear associated with rings, especially serrated ones, result in contamination of the skin around the ring area<sup>23</sup>

The study revealed that many of the respondents will not wash hands before putting on gloves or before changing gloves in the event of torn gloves. The drive to deliver dental care as quickly as possible, despite inadequate facilities, is a possible reason for not carrying out the recommended hand decontamination before gloving and in the event of torn glove. It may also be that the respondents are ignorant of the fact that high microbial load on the hand is significant enough to cause cross-infection.

A total of 73 (69.5%) indicated their need for more information on hand hygiene. The indicated areas of information needed by the respondents were indications for hand washing and steps in hand washing (Figure 4). Most of the respondents will prefer the information to be given in form of Seminars.

A total of 65.7% usually leave dental operatory without washing their hands and little more than half (54.3%) of the respondents would not wash hand before lunch. It may be proper to say that the respondents have deficient personal hygiene, as hand washing stands out prominently as a measure of personal hygiene.

Hand hygiene can be performed by washing hand with plain soap and water, and this has been the standard practice in dentistry. The use of a persistent-level antimicrobial hand wash or an alcohol-based hand rub is also acceptable. In this study, 80% of the respondents wash their hands with soap and water and only 2.9% of the respondents wash their hands with antiseptic preparations. Unacceptable practice of washing hands with only water was reported among 17.1% of the respondents. This further reflects bad practice among the studied health professionals. Drying of hands is an important aspect of Hand hygiene. The use of electric hand dryers is not so common in a developing country like Nigeria with epileptic power supply. Respondents mostly use hand towels provided by the clinic, personal handkerchiefs or they allow the hands to dry up naturally. The hand towels provided are usually not disposable and so there is a possibility of reuse and therefore contamination. The use of personal handkerchief for drying or leaving the hands to dry up naturally may also result in unexpected contamination.

Hand washing is an important indicator of safety and quality of care delivered in any health-care setting, because there is a substantial evidence to demonstrate the correlation between good hand hygiene practices and low health care associated infection rates (24). It substantially reduces the number of microbes that may be shared between patients and health care

personnel or between health care personnel and contaminated surfaces. In this study, majority strongly agreed that hand washing helps to prevent transmission of infection to patients, health worker and health workers family members. However, a reasonable number of respondents strongly disagreed that there exists any monitoring of hand washing to ensure compliance in the health institution. Formulation of policy geared at monitoring hand hygiene compliance in this institution is therefore desirable. There are a number of known factors affecting compliance with hand hygiene such as lack of time, high patient workload, patients' need taking priority, forgetfulness, lack of knowledge of importance of hand hygiene in preventing cross infection, poor access to handwashing facilities, lack of institutional commitment and skin irritation to hand hygiene products<sup>9-11</sup>. In this study, the main barriers to regular hand hygiene in descending order were lack of adequate facilities, forgetfulness and lack of time. Lack of time has also been cited as a barrier to hand hygiene among nursing students (11). Many of

the respondents realize that there is a need for more information on hand hygiene. This signifies that there is a self perception of deficiency in hand hygiene among the respondents. The indicated areas of information needed were the indications for hand washing and steps in hand washing. These are two key areas and if properly taught, a lot of ground would have been covered in hand hygiene.

## CONCLUSION

This study revealed high knowledge of the role of hand washing in the prevention of cross infection but inadequate hand washing practices and poor monitoring of hand hygiene in the health institution. There is an important need for educational and motivational intervention targeted at Dentist and Dental Students mostly in form of seminars and pamphlets. There is also a need for Institutional reforms which would facilitate the procurement of hand hygiene facilities, eliminate barriers to handwashing, formulate and implement policy to monitor hand hygiene compliance.

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