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Research Article

Hand Hygiene: Knowledge and Practice of Dental Therapists in Abuja, Nigeria

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Abstract

Objective: This is a study that seeks to assess the knowledge of Hand Hygiene among Dental therapist in Abuja and establish if there is a relationship between knowledge and practice of the therapist.

Methods: A cross-sectional survey consisting of dental therapists working in three tertiary health institutions randomly selected in the Federal Capital Territory (FCT) and two secondary health institutions also randomly selected. The sample population included dental students in their third year and final industrial attachment at dental health institutions, graduated students on internship and those on the National Youth Service Corps (NYSC). Close-ended questions such as "Your hands might become contaminated by simply touching the patient's intact skin" were asked to access Knowledge. Using a five point Likert scale, respondents were scored on answers such as "agree, strongly agree, don't know, disagree and strongly disagree". Data were recorded and analysed statistically using SPSS 20 version. Chi-square and Fisher's Exact Test were calculated.

Results: The result indicated that 55.3% of dental therapists strongly agreed with 38.3% who agreed that the hands might become contaminated by simply touching patient's skin. Also, 36.2% strongly agreed with 31.9% who agreed that inanimate objects belonging to patients such as bags, cell phones and newspapers are sources of infections. A high number, 83%, reported washing hands before and after donning hand-gloves.

Conclusion: Within the limitations of this study, the dental therapists in Abuja have a good knowledge of Hand Hygiene and they are putting that knowledge to practice.

Keywords: Hand Hygiene; Dental Therapist; Knowledge; Practice

Abbreviations

FCT: Federal Capital Territory; IBM: International Business Machines; HH: Hand Hygiene; SPSS: Statistical Package for the Social Sciences; USA: United States of America; WHO: World Health Organization

Introduction

The Dental clinic is an ideal area for cross-contamination of infection and when not properly controlled, may result in the transmission of infection from the dental staff including the dental therapist who are exposed to infectious materials such as poorly sterilized instruments, contaminated work surfaces, polluted water and air, to the patients who come into this environment with infectious body fluid, various undisclosed illness and their individual contaminants such as cell phones, bags, clothes and shoes. The transmission of infection between patients and clinical staffs or vice versa is known as cross-infection [1]. Research carried out reported that threats of infection are present in the dental clinic and that lots of infections are transmitted by blood or saliva through direct or indirect contact, droplets, aerosols and contaminated dental instruments [2].

According to the British association of Dental therapist, in their campaign to "Make Hand Hygiene go Viral", they gave a report from the European Centre for Disease Prevention and Control which stated that, "Healthcare-acquired infections affect more than four million patients a year in Europe and cost as much as seven billion euros (£5.5 billion) in additional healthcare and direct financial losses" [3]. Nevertheless, increasing evidence has shown that hand hygiene (HH) is a very effective method by which health care associated infections (HCAIs) are reduced [4,5]. Researchers have reported that strict observance of hand hygiene (HH) practices has considerably reduced the chances of acquisition of pathogens on hands and has ultimately reduced the rates of HCAIs in hospitals [6-11]. The significance of hand hygiene was apparent during the outbreak of the Ebola virus in Nigeria, when the public was encouraged to increase hand hygiene practice in schools, offices, hospitals and homes; the result was that the spread of the Ebola virus was curtailed and eliminated [12].

The World Health Organisation (WHO) has suggested guidelines for hand hygiene (HH) and the principal focus of the guidelines is to practice hand washing with soap and water when the hands are clearly dirty or soiled with blood or other body fluids or after using the toilet [13]. An alcohol-based hand rub/sanitizer with concentration of alcohol (Isopropanol or ethanol) ranging from 62% to 95% can be used when the hands are not visible soiled and these have been reported to reduce the growth of microorganisms, but are not able to penetrate and destroy bacterial [13,14]. In addition, the WHO has identified five areas of focus when HH should be practiced. These areas are: 1. before touching a patient; 2. before clean/aseptic procedures; 3. after body-fluid exposure event; 4. after touching patient; 5. after touching patient's surroundings [15].

In Nigeria, the dental therapist undergoes a training program that covers a period of forty months which culminates in the award of the Higher National Diploma (HND) [16]. Also, the dental therapist in Nigeria plays a similar role in the management of patients comparable to the role played by the dental hygienist in the United States of America [16]. A survey carried out in the United States of America reported that approximately half of the dental hygienists in a study indicated use of alcohol-based hand gels for hand hygiene and they had good knowledge of infection control guidelines (ICG) [17].

Objective of the Study

The Objective of this study is to assess the knowledge and practice of dental therapists in Abuja, the Federal Capital Territory (FCT) of Nigeria, if it meets internationally acceptable standards. Two main research questions are expected to be answered namely:

1. Does the dental therapist in Abuja, Nigeria have the knowledge of hand hygiene?
2. Is there any relationship between his practice of hand hygiene and his knowledge of hand hygiene?

Material and Methodology

Ethical permission was applied for and approved by the Federal Capital Territory (FCT) health and ethics committee, Abuja FCT. This is a cross-sectional survey consisting of the entire dental therapists working in three tertiary health institutions randomly selected in the Federal Capital Territory (FCT) namely: University of Abuja Teaching Hospital Abuja, National Hospital Abuja, Garki General Hospital Garki Abuja, and two secondary health institutions also randomly selected namely: State House Medical Centre, Aso Rock Abuja and General Hospital Kubwa, Abuja. All the institutions selected have standard Dental Clinics with facilities for training dental therapist students on industrial training and graduated students on internship.

The sample population included dental therapist students in their third year and final industrial attachment in their chosen health institutions, graduated students on internship and those on the National Youth Service Corps in Nigeria NYSC (a compulsory one year service to the country for those below 30 years of age, above 30 years are granted exceptions). Also included are dental therapists who were working as staffs in the sampled health institutions. Excluded from this study were students of schools of dental therapy who are in their first and second year on industrial training, retired dental therapist and all who have left the practice of dental therapy for more than 6 (six) months. Structured questionnaires were used to get biodata of respondents and years of experience, close-ended questions such as "Your hands might become contaminated by simply touching the patient's intact skin" and "Normal routine hand hygiene removes organism which are on the superficial layers of the skin only" were asked to access knowledge. Using a five point Likert scale [18], respondents were scored on answers such as "agree, strongly agree, don't know, disagree and strongly disagree". Strongly disagree was scored 1, while strongly agree was scored 5 with a maximum score of 50; scores 1 - 10 was regarded as poor, 11 - 20 as fair, 21 - 30 as good, 31 - 40 as very good, 41 - 50 as excellent. To access practice, close-ended questions such as "Which of the following is the most appropriate method of Hand hygiene in the Dental Clinic?" and "the best time to perform hand hygiene is?" were asked and the Likert scale [18] was also used here with respondents required to pick the most appropriate answers from options A-E provided. Correct answers got a score of 1 while wrong answers were scored 0; maximum score was 10 and minimum score was 0, 0 - 3 was scored as poor; 4 - 6 as fair, 7 and above was scored as good. Data were recorded and analysed statistically using SPSS 20 version. (IBM Corp., Armonk, NY, USA). Chi-square test statistics was done to compare the two variables and Fisher's Exact Test was calculated with 95% confidence interval.

Results

Sampled population was 47 consisting of 59.6% female, 40.4% male. The higher number of females in the study had no statistical significance in this study. Details in table 1.

Variable	Frequency (n = 47)	Percentage
Age group (years)		
≤ 25	20	42.6
26 - 35	14	29.8
> 35	13	27.7
Gender		
Male	19	40.4
Female	28	59.6
Years of practice		
≤ 5	30	63.8§
> 5	17	36.2

Table 1: Socio-demographic characteristics of respondents
§: A high percentage, 63.8% had less than 5% years of practice as dental therapist which could be interpreted to mean that the number of years of practice has no effect on their knowledge and practice of Hand Hygiene although this was not statistically significant in this present study.

About 55.3% of the respondents strongly agreed with 38.3% who agreed that the hands might become contaminated by simply touching patient's skin while 36.2% strongly agreed with 31.9% who also agreed that inanimate objects belonging to patients such as bags, cell phones and newspapers are sources of infection in the dental clinic. See details in table 2 below.

Dental therapists in Abuja are reported to be practicing internationally acceptable method of hand hygiene in the dental clinic by effectively washing hands with soap before and after donning the hand-gloves. They also reported never to be in a hurry to carry out effective hand hygiene practice as shown in table 3 below.

n = 47	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Hand might become contaminated by simply touching patients skin	26 (55.3)†	18 (38.3)	3 (6.4)	0 (0.0)	0 (0.0)
Normal routine hand hygiene removes organism which are on the superficial layer on skin only	26 (55.3)†	14 (29.8)	2 (4.3)	2 (4.3)	3 (6.4)
Inanimate objects belonging to patients such as bag, cell phone and newspaper can contaminate hands	17 (36.2)	15 (31.9)	4 (8.5)	3 (6.4)	8 (17.0)
Cell phone, wedding rings wristwatches and nails are reservoir of contaminant	26 (55.3)†	18 (38.3)	0 (0.0)	2 (4.3)	1 (2.1)
Good hand hygiene practice is the single most important and cost effective means of reducing cross-infection in the dental clinic	18 (38.3)	23 (48.9)†	2 (4.3)	3 (6.4)	1 (2.1)

Table 2: Knowledge of hand washing.

†: Respondents have good knowledge of Hand Hygiene

Variable (n = 47)	Frequency	Percentage
Most appropriate method of hand hygiene in dental clinic (Multiple response)		
Hand rubbing with disinfectant	39	83.0
Hand washing with soap	41	87.2¶
Cleaning the hand with white handkerchief	4	8.5
Best time to perform hand hygiene (Multiple response)		
At beginning of work	13	27.7
After gloving	15	31.9
When hand visibly soiled	13	27.7
Before and after gloving	39	83.0¶
Best practice to keep the hand clean (Multiple response)		
Washing with water and plain soap	14	29.8
Washing with water antimicrobial soap	43	91.5¶
Washing with water and hand lotion	0	0.0
Alcohol based hand rub only	14	29.8
Important hand part that should be washed (Multiple response)		
The wrist only	0	0.0
The palm, between finger, the back surface of the hand and the wrist	44	93.6¶
The palm and back surface of the hand only	9	19.1
The palm, the back surface of the hand and the wrist	10	21.3
When many patients waiting		
Wash the hand gloves without removing them and move to next patients	0	0.0
Wash hand with antimicrobial soap ad see the next patients without putting on hand gloves	0	0.0
Dust hand clean with white paper, put on gloves, put o gloves and see the next patients	0	0.0
Change gloves quickly and see patients	4	8.5
Wash hand, wear gloves and see next patients. when you finish, wash your hand and repeat process for each patients	43	91.5¶

Table 3: Dental therapist practice.

¶: A high percentage of the dental therapist in this present study were performing internationally accepted Hand Hygiene Practice.

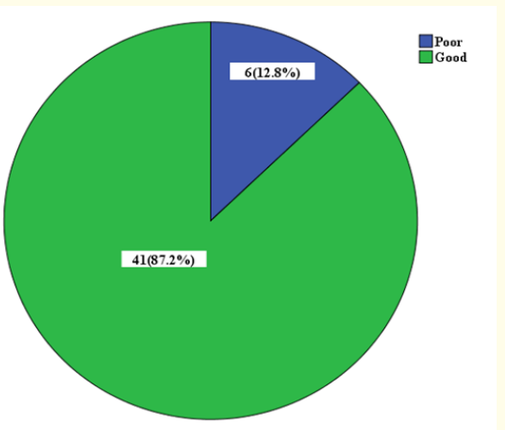

Figure 1: Practice of hand washing among dental therapist.

Discussion

The number of dental therapist that participated in this study was 47 and this consisted of 59.6% female, 42.6% male. It was noticed that 42.5% of the respondents were less than 25 years of age while 63.8% had less than 5 years of experience in the practice of dental therapy, although there was no statistical significance of respondent's age and years of practice.

A good number of the respondents, as shown in table 1, about 55.3% strongly agreed that being in contact with patients skin can contaminate the hands of the dental therapist and 55.3% again strongly agreed that normal routine HH removes organism that are on the superficial layer of the skin only. Interestingly, 6.4%, a small percentage though does not agree that normal routine HH removes organism that are on the superficial layer of the skin only. Nevertheless, it is generally accepted that according to the world Health Organization (WHO), the identified five main areas when HH should be practiced in a clinical setting are: 1. before touching a patient; 2. before clean/aseptic procedures; 3. after body-fluid exposure event; 4. after touching patient; 5. after touching patient's surroundings [15]. Furthermore, the result in this study as shown in table 2 reveals that 38.3% strongly agreed and 48.9% agreed with the statement that a good HH practice is the single most important and cost effective means of reducing cross-infection in the dental clinic. This statement is in consonance with the research of Martín-Madrazo., *et al*. who categorically mentioned that HH is the most effective measure for preventing healthcare associated infections and added that HH influence on the reduction of infections was estimated at 50% [19].

While merely reporting on the standard of practice of HH is not enough to prove conformity with best practices [20], it suffices to state here that the dental therapists in this research reported an excellent level of HH in conformity with internationally acceptable practice in the dental clinic. The practice of washing hands before and after donning hand-gloves was carried out by 83% of the dental therapists. This habit is encouraged because the gloves do not completely protect the hands on their own. Also, hand-gloves may have microscopic pores when they are stretched [21], thus it is important to wash the hands before donning hand-gloves to prevent and control cross-infection in the dental clinic that may occur through these microscopic pores. Moreover, hand-gloves may infect the hands when they are removed especially the already perforated ones [20]; hence it is in strict compliance to the HH protocols internationally practiced and recommended that the hands should be disinfected before and after contacting patients and before and after removing the gloves [20-22]. This recommended good practice of hand hygiene among dental therapist is reported to be carried out among the 87.2% in this present study as shown in figure 1.

Conclusion

This study set out to investigate whether the dental therapist in Abuja has knowledge of hand hygiene (HH). At the end of this research, the result has shown that the dental therapist in Abuja has an adequate and acceptable level of knowledge of hand hygiene (HH). The dental therapist in Abuja has been able to bridge the gap between knowledge and practice because the result also indicates that they are putting their knowledge to practice.

Of note here is that this study was conducted with a small population of dental therapist and this might have affected the results since a larger population would give depth and stronger results. The results of HH practices were completely reported by respondents without supervision and they could have influenced one another. Further studies should be carried out and Hand hygiene compliance rates should be measured using structured observational method. With this method, each person should be observed during a continuous period of care for at least 30 minutes and the observation with the validation of observers should be conducted according to the WHO Guidelines on HH in Health Care (part III) (2009).

Finally, this study is an opportunity for dental therapist and trainers to undergo continuous dental education on HH and to sustain the quality of HH practice.

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Conflict of Interest

There is no conflict of interest to declare. No financial support was received for this paper.

Questionnaire

Hand Hygiene: Knowledge and Practice of Dental Therapist.

Dear respondent,

We are carrying out a research which would help us in carrying out infection control in the Dental office. Your kind attention to these questions is appreciated. Be assured of our utmost confidentiality in this research. THANK YOU!!!

Section A:

AGE:…….. SEX: Male……..; Female……..;

DESIGNATION: Dental therapist……, IT Students…... Intern……..., Youth Corper…….

YEARS OF PRACTICE:……

Section B:

Please tick one box per question only.

No.s	Questions	I agree	I strongly agree	I don't know	I strongly disagree	I disagree
	Your hands might become contaminated by simply touching the patient's intact skin.					
	Normal routine hand hygiene removes organism which are on the superficial layers of the skin only.					
	Inanimate objects belonging to the patients such as bags, cell phones and newspapers can contaminate your hands.					
	Your cell phones, wedding rings, wristwatches and nails are reservoirs of contaminants.					
	Good hand hygiene practice is the single most important and cost effective means of reducing cross-infection in the dental clinic.					

Section C:

Please tick only one answer you feel is correct:

1. Which of the following is the most appropriate method of Hand hygiene in the Dental Clinic?
    a. Hand rubbing with disinfectant
    b. Hand washing with Soap
    c. Cleaning the hands with a white handkerchief
    d. A and B are correct
    e. A and C are correct

2. The best time to perform hand hygiene is
    a. At the beginning of work
    b. After gloving
    c. When the hands are visibly soiled
    d. Before and after gloving
    e. All of the above

3. Which of the following is the best practice to keep the hand clean?
    a. Washing with water and plain soap
    b. Washing with water and antimicrobial soap
    c. Washing with water and hand lotion
    d. Alcohol based hand rubs only
    e. All of the above

4. Which of the following parts of the hand should be washed?
    a. The wrist only.
    b. The palm, between the fingers, the back surface of the hand and the wrist.
    c. The palm and between the fingers only.
    d. The palm and the back surface of the hand only.
    e. The palm, the back surface of the hand and the wrist.

5. When you have a lot of patients waiting, it is acceptable to:
    a. Wash the hand-gloves without removing them and move to the next patient
    b. Wash your hands with antimicrobial soap and see the next patient without putting on hand gloves
    c. Dust your hands clean with a white tissue paper, put on your glove and see the next patient
    d. Change the gloves quickly and see the next patient
    e. Wash your hands, wear your gloves and see the next patient. When you finish, remove your gloves, wash your hands and repeat the same process for each patient.

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Volume 2 Issue 5 May 2018