

# Oral Health Practices and Oral Hygiene Status of Undergraduate Students at Ile-Ife, Nigeria

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## ABSTRACT

**Background:** Good oral hygiene is necessary for optimal oral health and sound systemic health. Oral hygiene practices of undergraduates in various disciplines are well documented, but little is known about their oral hygiene status in relation to the oral hygiene practices.

**Objective:** The objective of the present study was to determine the oral hygiene status and practices of undergraduate students at the Obafemi Awolowo Obafemi University, Ile-Ife, Nigeria.

**Methods:** Demographic details and oral health practice information were obtained from consenting participants using structured, examiner-administered questionnaires. The participants were randomly selected from all the university undergraduate students and examined. Oral hygiene status was determined using simplified Green and Vermilion Oral Hygiene Index (OHI). Data were analysed using STATA 11 statistical software.

**Results:** A total of 150 participants, comprising 78 (52.0%) females and 72 (48.0%) males, participated in the study. The mean (standard deviation) age of the participants was 22.8 (2.7) years with a median age of 23 years. Seventy-three (48.7%) of the 150 participants had good oral hygiene with mean OHI of 0.86 (0.9). Majority (148, 98.7%) of the participants cleaned their teeth with toothpaste and toothbrush. Seventy (46.6%) attended dental care only on account of pain. Faculty of Dentistry had the highest proportion of students with good oral hygiene.

**Conclusions:** Less than 50% of the participants had a good oral hygiene. This was rather not encouraging for undergraduate students. The fact that Faculty of Dentistry had the highest proportion of students with good oral hygiene suggests that long-term exposure to oral health education and knowledge of good oral health practices are important for oral health hygiene. This was supported by the fact that those with longer stay in university had higher proportion of students with oral hygiene.

**Key words:** Oral hygiene practices, oral hygiene status, students

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## INTRODUCTION

Good oral health implies freedom from orofacial pain, oropharyngeal cancer, oral tissue lesions, orofacial birth defects and other diseases affecting the craniofacial complex. Good oral health, therefore, has more far-reaching implications than merely having 'good teeth' and is essential to optimal general health.<sup>1,2</sup>

Several documented factors, including socioeconomic, environmental, biologic, behavioural factors as well as access to health care facilities, have influences on oral health. A person's oral health status is the result of a delicate interplay of these pro-oral health and anti-oral health factors and practices.

Although may have far-reaching general implications, oral health problems are often neglected and often diagnosed as a result of accidental discovery.<sup>3</sup> Such neglected unmet dental needs are a common phenomenon in countries with poor oral health awareness, and many patients only attend for dental care on account of unbearable pain.<sup>4</sup>

Education plays an important role in the utilisation of dental services. Unfortunately, education seems to be irrelevant unless oral health education is available and is accessed by an 'educated' population. Given the educational level of university

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students, it is expected that the concept and importance of oral health would be easily understood and applied irrespective of the discipline.<sup>4</sup> This is, however, not always the case as exemplified by the result of a recent study which found that about six of every ten undergraduates had never visited a dentist.<sup>1</sup>

Oral hygiene behaviour of undergraduates is well documented among students across several disciplines including dentistry,<sup>5-7</sup> medicine,<sup>8</sup> engineering<sup>9</sup> and other disciplines.<sup>10</sup> Most of these studies, however, did not specifically evaluate the oral hygiene status of the students, thus necessitating the current study to evaluate the oral hygiene status and practices of undergraduate students in a leading Nigerian university.

## MATERIALS AND METHODS

This was an analytic cross-sectional survey conducted from October 2014 to February 2015. The study was conducted among students of Obafemi Awolowo University, Ile-Ife in southwestern Nigeria. The university offers professional training in Dentistry, Medicine, Nursing, Engineering and Law. Being a foremost federal university, it admits students from all nooks and crannies of Nigeria with the total number of over 35,000 students. A large percentage of the students reside in the university hostels.

### Sample size determination

The prevalence of good oral hygiene previously reported among dental students of 87.8% (P1)<sup>11</sup> with that of other university students in comparison with the postulated prevalence of 55% (P2) in the present study formed the basis for the sample size calculation. Alpha was set at 5%, power at 80% and  $n_2/n_1$  of 5. The resultant estimated sample size using STATA statistical software<sup>12</sup> with two sample comparison of proportions was 22 ‘dental students’ = (n1) and 110 ‘other students’ = (n2). The estimated sample size was, therefore, 132 with an additional 18 participants to account for attrition. This brought the total estimated sample size to 150.

### Participants

Participants were consecutive students of Obafemi Awolowo University, Ile-Ife, who consented to participate in the study. Participants were selected using a simple random sampling technique.<sup>13</sup> The sampling procedure involved researchers staying at the entrance linking the major halls of residence to the academic areas. Recruitment was carried out from 8 am to 10 am each day. The timing of the recruitment exercise was based on the assumption that the majority of students attended lectures in the academic areas and will pass through this entrance around the stipulated time. Randomisation was performed using a box containing wrapped papers with concealed ‘YES’ or ‘NO’ inscriptions. Each consenting student was allowed to pick one wrapped paper, and upon opening, those who picked ‘YES’ were recruited into the study. Participants were allowed to rescind their decision to participate at any stage of the study.

### Study instrument

Information was collected from the participants using a structured questionnaire consisting of three sections. Section A comprised questions on biodata, namely, age, sex, marital status and ethnicity. Section B enquired for information on general oral hygiene practices with questions such as ‘what do you use to clean your mouth?’, ‘how often do you visit the dentist?’, ‘which type of toothbrush do you use?’ and ‘which method of brushing do you use?’; while Section C was used for recording the results of clinical oral examination. Oral health status was determined using the simplified Oral Hygiene Index (OHI) of Green and Vermilion which was calculated by adding the average of plaque and calculus index.<sup>14</sup> OHI scores of 0–1.1 were graded as good, 1.2–2.9 as fair and more than 3.0 graded as poor oral hygiene.

### Data analysis

Data were analysed using Stata 11 statistical software (Statacorp, College Station, Texas, USA). The mean, median and interquartile range were determined for continuous variables such as age and OHI, these variables were also subjected to normality tests. For categorical variables such as sex, marital status and faculties, simple frequency and percentages were determined. Comparison statistics of the variations in the mean OHI between the faculties were performed using ANOVA test. Level of statistical significance was set at  $P < 0.05$ .

## RESULTS

### Sociodemographic data of the respondents

A total of 150 students comprising 78 (52.0%) females and 72 (48.0%) males participated in the study. Table I shows the sociodemographic distribution of the respondents. Yoruba ethnic group was the largest comprising 130 (86.7%) of the participants. The other small ethnic groups were Igbo (7.3%) and Hausa (6.0%).

The ages of the participants ranged between 17 and 31 years with mean (standard deviation [SD]) of 22.8 (2.7) years. The median age was 23 years and the interquartile range 25 (Q3)–21 (Q1) was 4. The largest age group was 21–30 years, accounting for 113 (75.3%) of the participants. Only 2 (1.3%) of the participants were older than 30 years. One hundred and forty-eight (96.7%) were single while only 2 (1.3%) were married. Thirty nine (26.0%) of the students were in their 2<sup>nd</sup> year of study accounting for the largest group.

### Distribution of participants by the faculty

Students were recruited from all faculties within the university community. Table II shows the distribution of participants by the faculties. The highest number of the respondents 27 (18.0%) were from the Faculty of Social Sciences and the least number of 4 (2.67%) were from the Faculty of Environmental Design and Management.

### Oral hygiene practices of respondents

Table III shows the distribution of oral hygiene practices among the respondents. One hundred and forty-eight (98.5%)

**Table I: Sociodemographic distribution of the respondents**

Variables	n (%)
Sex	
Male	72 (48.0)
Female	78 (52.0)
Age (years)	
Ranged	Between 17 and 31
Mean (SD)	22.8 (2.71)
Age distribution	
<20	35 (23.3)
21-30	113 (75.3)
31	2 (1.3)
Marital status	
Single	148 (96.7)
Married	2 (1.3)
Ethnicity	
Yoruba	130 (86.7)
Igbo	11 (7.3)
Hausa	9 (6.0)
Level of education (level)	
100	12 (8.0)
200	39 (26.0)
300	29 (19.3)
400	32 (21.3)
500	13 (8.7)
600	25 (16.7)

**Table II: Participants by faculty**

Faculty	n (%)
Agriculture	6 (4.0)
Administration	15 (10.0)
Arts	10 (6.7)
Basic medical science	5 (3.3)
Medicine	10 (6.6)
Dentistry	22 (14.7)
Education	7 (4.7)
Environmental studies	4 (1.7)
Pharmacy	7 (4.6)
Science	12 (8.0)
Social science	27 (18.0)
Technology	16 (10.7)
Law	9 (6.0)
Total	150 (100.0)

of the 150 participants used tooth paste and toothbrush to clean their teeth. Medium textured toothbrush was preferred by many 87 (58.0%) of the respondents. Ninety four (63.1%) of respondents were changing their toothbrush every 3 months while 32 (21.3%) retained their toothbrush for as long as it was still 'useful.' One hundred and sixteen (77.3%) of respondents cleaned their mouth once daily with 67 (44.9%) preferring the vertical method. A total of 142 (94.6%) of respondents frequently consumed refined carbohydrates.

Thirty eight (25.3%) of the respondents had never visited dentist before, while 70 (46.7%) of the respondents visited the dentists only on account of pain or other compliant while 6 (4.0%) visit the dentist every 6 months.

### Relative mean oral hygiene index and distribution of oral hygiene status among students in various faculties

Table IV shows the oral hygiene status of students in various faculties that participated in the study. This is also illustrated in Figure 1. A total of 73 (48.7%) of the 150 students had good oral hygiene while the proportions with fair and poor oral hygiene were 68 (45.3%) and 9 (6.0%) respectively. Faculty of Dentistry with mean (SD) OHI of 0.3 (0.6) had the highest proportion of students with good oral hygiene status with 17 (77.3%) of the 22 dental students having good oral hygiene. The mean (SD) of OHI of participants from Faculty of Science was 0.4 (0.7) with 9 out of 12 participants (75.0%) from that faculty having oral good hygiene status. Similar proportions of participants with good oral hygiene were also seen among the students from the Faculties of Administration and Science where 9 out of 15 (60.0%) and 5 out of 9 (55.5%) participants respectively had good oral hygiene. Students from the Faculty of Environmental Design and Management had the highest mean OHI of 1.9 (1.4) with only 1 (25.0%) the four students having good oral hygiene.

Figure 2 shows the percentage distribution of oral hygiene status at various educational levels. The figure showed that the proportion of students with good oral hygiene increased with the number of years of study in the university from 1<sup>st</sup> to 4<sup>th</sup> year and thereafter reduced in among 5<sup>th</sup> year students, though the association with year of study was not statistically significant ( $P = 0.556$ , Fisher's exact). Highest proportion of students with poor oral hygiene was documented among part V students.

## DISCUSSION

Oral health, an integral part of general health is often neglected<sup>15</sup> as a result of ignorance, poverty, non-availability of dental facilities and inadequate dental personnel. Another reason for the neglect of oral health is the burden of general ill-health. Poor general health often overwhelms patients with real or perceived more life-threatening conditions.<sup>16</sup> The question is, should these reasons undermine the overwhelming merits of keeping good oral health? Maybe not, especially because good oral health imparts positively on general quality of life and social interaction and improves response to treatment of underlying systemic diseases.<sup>17,18</sup> Unfortunately, the case of oral health often plays the second fiddle in the minds of most individuals.<sup>19</sup>

The frequency, pattern and efficiency of oral hygiene practices differ across different groups of people. The present study found that almost 99% of the respondents used toothpaste and toothbrush to clean their teeth, corroborating the results of previous studies.<sup>17-19</sup> Ready availability and low cost

probably account for the growing popularity of toothpaste and toothbrush. In addition, unlike abrasives and tooth-cleaning sticks, erroneously called chewing sticks, the toothpaste and toothbrush combination is considered more convenient, efficient and is generally advocated by oral health professionals.

Medium-textured toothbrushes are considered gum and oral tissue friendly.<sup>20</sup> The use of medium-textured toothbrushes by close to 60% of the respondents in the present study was encouraging and is in line with professional dental advice.<sup>21</sup> Only 20% of the respondents in the present study brushed twice daily despite the emphasis on twice a day in most public dental awareness programmes.<sup>22</sup> Setia *et al.*<sup>7</sup> in a study of 277 students, reported that only 54.4% brushed their teeth twice daily. Though this was much higher than the finding in the present study, these disappointing results might be a reflection of the general negative attitude of the public to their own oral health care.

**Table III: Oral health and oral hygiene practices among respondents**

	<i>n</i> (%)
What was used to clean the mouth	
Toothbrush and toothpaste	148 (98.7)
Chewing stick	2 (1.3)
Types of toothbrush used	
Hard textured	25 (16.7)
Medium textured	87 (58.0)
Soft textured	37 (24.6)
Not using toothbrush	1 (0.7)
Frequency of changing toothbrush	
Every month	8 (5.3)
Every 3 months	94 (62.7)
Every 6 months	16 (10.7)
As long as it is still useful	32 (21.3)
Frequency of daily brushing the teeth	
Once	116 (77.3)
Twice	30 (20.0)
After every meal	3 (2.0)
Occasionally	1 (0.7)
Method used in brushing the teeth	
Horizontal	51 (34.0)
Vertical	67 (44.7)
Other methods not specified	32 (21.3)
Time spent in brushing the teeth	
<1 min	21 (14.0)
Between 1 and 4 min	93 (62.0)
>4 min	36 (24.0)
Frequency of visits to the dentist	
Every month	7 (4.7)
Once in 3 months	1 (0.7)
Once in 6 months	6 (4.0)
Anytime I feel like	28 (18.7)
Anytime there was pain/complaints	70 (46.6)
Had never been to the dentist before	38 (25.3)
Frequency of taking refined sugar	
At least once a day	143 (95.3)
Occasionally	7 (4.7)

A good brushing technique is essential to maintaining good oral hygiene. Only about half of the respondents in the present study used the recommended vertical brushing method, corroborating the results of previous studies.<sup>21,23</sup> Sadly, this method was not popular among the respondents in the present study this is inspite of it being more efficient and less traumatic than the horizontal, scrubbing and other wrong brushing methods practiced by some of the respondents.

The present study also corroborated the belief that the culture of twice-yearly dental visits was not popular as only about 4% of the respondents visited the dentist twice a year. Close to 50% of the respondents in the present study visited dentists only for the relief of pain or other dental complaints reflecting their poor altitude to oral health care. This probably explained the late diagnosis and poor prognosis of many oral lesions.<sup>24</sup> In the present study only about 25% of the respondents had never visited the dentist despite the frequent consumption of refined carbohydrates by more than 95% of them. These finding were unlike the findings of Lawal *et al.*<sup>25</sup> and Kumar<sup>1</sup> who reported that about 40% and 58% of students respectively did not have previous dental visits. This attitude might not be unrelated to the general delay in health seeking behaviour until problems arises.<sup>26</sup>

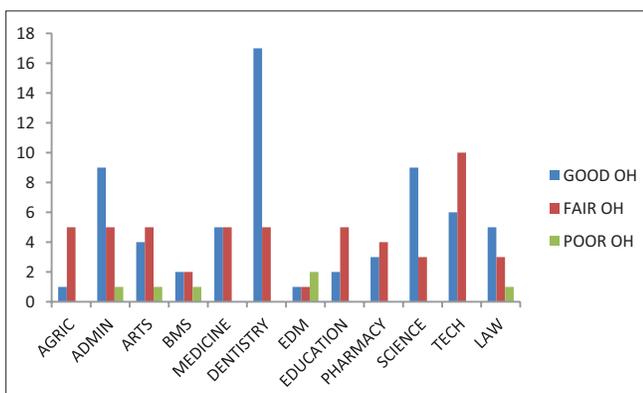
Previous studies had established a strong relationship between health behaviour and the individual's immediate environment.<sup>6,27</sup> This might partly explain the differences students in oral hygiene status displayed in various faculties. There is a paucity of studies comparing the oral hygiene status of undergraduates between various faculties. In the present study, the prevalence of good oral hygiene was highest among dental students, followed students in the Faculties of Science, Administration and Law. The professional training of dental students appeared to have positively influenced their oral health practices corroborating a previous study among dental surgeon assistant students.<sup>25</sup> In that study, Lawal *et al.*<sup>25</sup> reported that about 90% of the students had good oral hygiene. Next to dental students in proportion of students with good oral hygiene were students in Faculties of Science, Administration and Law which may be due to their general altitude to health. It was however surprising that medical students who were generally believed to be well informed about their general health, apart from oral health, had poor knowledge of and altitude to oral health in agreement to reports by previous workers.<sup>8,28,29</sup> This probably accounted for the low prevalence of good oral hygiene among medical students in the present study. Generally however, poor oral hygiene is not common among undergraduate students in the present study probably as a result of their knowledge and environment influence.

The number of years spent in the university is another factor that has been found to influence oral hygiene practices and oral hygiene status.<sup>30,31</sup> The present study showed that the proportion of respondents with good oral hygiene increased progressively from 100 level to 400 with a slight drop at 500 level and a sharp increase in 600 level. This was probably due to fact that the longer the student stays in the university

**Table IV: Oral hygiene status of students in various faculties**

Faculty	Mean OHI (SD)	Oral hygiene status			Total, n (%)
		Good, n (%)	Fair, n (%)	Poor, n (%)	
Agricultural science	1.3 (0.6)	1 (16.7)	5 (83.3)	0	6 (100.0)
Administration	0.7 (0.9)	9 (60.0)	5 (33.3)	1 (6.7)	15 (100.0)
Arts	1.1 (1.0)	4 (40.0)	5 (50.0)	1 (10.0)	10 (100.0)
Basic medical science	1.2 (1.2)	2 (40.0)	2 (40.0)	1 (20.0)	5 (100.0)
Medicine	0.8 (0.8)	5 (50.0)	5 (50.0)	0	10 (100.0)
Dentistry	0.3 (0.6)	17 (77.3)	5 (22.7)	0	22 (100.0)
Environmental design and management	1.9 (1.4)	1 (25.0)	1 (25.0)	2 (50.0)	4 (100.0)
Education	1.1 (0.73)	2 (28.6)	5 (71.4)	0	7 (100.0)
Pharmacy	0.9 (0.8)	3 (42.9)	4 (57.1)	0	7 (100.0)
Science	0.4 (0.7)	9 (75.0)	3 (25.0)	0	12 (100.0)
Socials sciences	1.2 (1.0)	9 (33.3)	15 (55.6)	3 (11.1)	27 (100)
Technology	0.9 (0.6)	6 (37.5)	10 (62.5)	0	16 (100.0)
Law	0.8 (1.1)	5 (55.6)	3 (33.3)	1 (11.1)	9 (100.0)
Total	0.9 (1.0)	73 (48.7)	68 (45.3)	9 (6.0)	150 (100.0)

ANOVA for comparing mean oral hygiene index between faculties, this gives  $P=0.0305$  (which is statistically significant) and df of 12. Oral OH assessment done using simplified green and vermilion OHI. Participants with oral hygiene index scores of 0-1.1 were graded as good oral hygiene status, those with 1.2-2.9 as fair and  $>3.0$  graded were poor oral hygiene status. ANOVA: Analysis of variance, df: Degree of freedom, OHI: Oral hygiene index, OH: Oral health, SD: Standard deviation

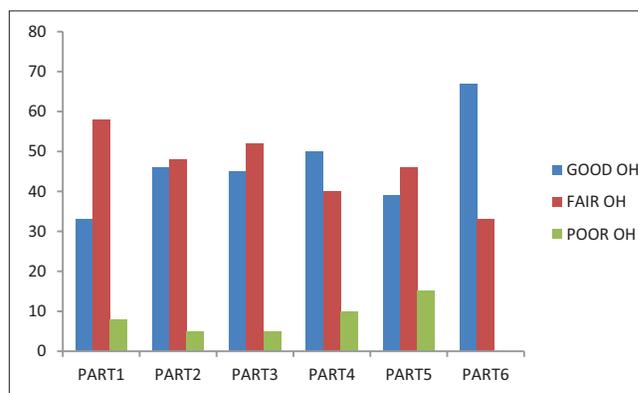


**Figure 1:** Relative oral hygiene of the students by faculties

the more they get used to the university lifestyle, including the clean environment and personal hygiene.<sup>32</sup> In addition, majority of the year six students were dental students who by virtue of their training, had a good exposure to dental practice in their training and hence tends to keep good oral hygiene practices.

## CONCLUSIONS

The present study showed that less than half of the participants had good oral hygiene. This was rather discouraging because dental hospital is located within the university environment with opportunity for better assess for good oral care. The results of the present study also showed that nearly all the students were using toothbrush and toothpaste as tooth cleaning aid, but less than half of them were using the recommended vertical methods of tooth brushing in cleaning their mouth. Faculty of Dentistry had the highest proportion of participating students with good oral hygiene. This probably resulted from their



**Figure 2:** Percentage distribution of oral hygiene status at various educational levels

dental training and exposure to recommended good dental practice. Moreover, students who had spent 6 years in the university had the best oral hygiene status since they would have had more exposure to oral health education and practice in the university environment. A very high proportion of the participants were frequently consuming refined sugar which probably contributed to high proportion of students with just fair and poor oral hygiene status. In addition, the majority of students visit dentists only when they had pain and complaints and therefore did not avail themselves with preventive oral health care.

Since good oral hygiene practices are essential to optimal oral and general health, oral health education efforts should continue to emphasise the importance of good oral hygiene practices. This will help to fill the gap between oral health knowledge, good oral health practices and good oral hygiene. This is even more imperative in Nigeria where access to and

cost of dental treatments still remain a great challenge to dental services utilisation.

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### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Kumar S. Oral hygiene awareness among two non professional college students in Chennai, India – A pilot study. *Adv Life Sci Technol* 2012;5:31-6.
2. World Health Organisation. World Health Report 1999; Making a Difference. Geneva, Switzerland: WHO; 1999.
3. Vargas CM, Dye BA, Hayes KL. Oral health status of rural adults in the United States. *J Am Dent Assoc* 2002;133:1672-81.
4. Oyetola EO, Oyewole T, Adedigba M, Aregbesola ST, Umezudike K, Adewale A. Knowledge and awareness of medical doctors, medical students and nurses about dentistry in Nigeria. *Pan Afr Med J* 2016;23:172.
5. Al-Wahadni A, Al-Omari MA. Dental diseases in a Jordanian population on renal dialysis. *Quintessence Int* 2003;34:343-7.
6. Komabayashi T, Kwan SY, Hu DY, Kajiwara K, Sasahara H, Kawamura M. A comparative study of oral health attitudes and behaviour using the Hiroshima University – Dental Behavioural Inventory (HU-DBI) between dental students in Britain and China. *J Oral Sci* 2005;47:1-7.
7. Setia S, Pannu P, Gambhir RS, Galhotra V, Ahluwalia P, Sofat A. Correlation of oral hygiene practices, smoking and oral health conditions with self perceived halitosis amongst undergraduate dental students. *J Nat Sci Biol Med* 2014;5:67-72.
8. Al-Hussaini R, Al-Kandari M, Hamadi T, Al-Mutawa A, Honkala S, Memon A. Dental health knowledge, attitudes and behaviour among students at the Kuwait University Health Sciences Centre. *Med Princ Pract* 2003;12:260-5.
9. Doshi D, Baldava P, Anup N, Sequeira PS. A comparative evaluation of self-reported oral hygiene practices among medical and engineering university students with access to health-promotive dental care. *J Contemp Dent Pract* 2007;8:68-75.
10. Kirtiloglu T, Yavuz US. An assessment of oral self-care in the student population of a Turkish university. *Public Health* 2006;120:953-7.
11. Mranali KS, Karthik S, Bijju T, Ramya S, Shilpa S. Oral hygiene status and gingivitis among undergraduate dental students a descriptive survey. *J Med Sci Clin Res* 2014;2:2589-93.
12. Corp S. Stata Statistics/Data Analysis. Version 10, Special Edition. Texas, USA; 1984-2007. Available from: <http://www.stata.com>. [Last assessed 2015 Dec 20].
13. Suresh K, Thomas SV, Suresh G. Design, data analysis and sampling techniques for clinical research. *Ann Indian Acad Neurol* 2011;14:287-90.
14. Greene J, Vermillion J. The oral hygiene index; a method for classifying oral hygiene status. *J Amer Dent Association* 1960;60:29-35.
15. Zwiach R, Bruzda-Zwiach A. Does oral health contribute to post-transplant complications in kidney allograft recipients? *Acta Odontol Scand* 2013;71:756-63.
16. Proctor R, Kumar N, Stein A, Moles D, Porter S. Oral and dental aspects of chronic renal failure. *J Dent Res* 2005;84:199-208.
17. Suliman NM, Johannessen AC, Ali RW, Salman H, Aström AN. Influence of oral mucosal lesions and oral symptoms on oral health related quality of life in dermatological patients: A cross sectional study in Sudan. *BMC Oral Health* 2012;12:19.
18. Esra G, Hilai U, Bahar T, Dilek T. Oral health related quality of life and periodontal health status in patients undergoing haemodialysis. *JADA*. 2009;140.
19. Judith TK, Brenda MK. The dental health status of dialysis patients *Journal of the Canadian Dental Association* 2002;68:34-8.
20. Robinson PJ, Maddalozzo D, Breslin S. A six-month clinical comparison of the efficacy of the Sonicare and the Braun Oral-B electric toothbrushes on improving periodontal health in adult periodontitis patients. *J Clin Dent* 1997;8:4-9.
21. Rapley JW, Killoy WJ. Subgingival and interproximal plaque removal using a counter-rotational electric toothbrush and a manual toothbrush. *Quintessence Int* 1994;25:39-42.
22. Lam OL, McMillan AS, Samaranyake LP, Li LS, McGrath C. Randomized clinical trial of oral health promotion interventions among patients following stroke. *Arch Phys Med Rehabil* 2013;94:435-43.
23. Warren PR. Development of an oscillating/rotating/pulsating toothbrush: The Oral-B professionalCaretrade mark series. *J Dent* 2005;33S1:1-9.
24. Potter JL, Wilson NH. A dental survey of renal dialysis patients. *Public Health* 1979;93:153-6.
25. Lawal FB, Olawole WO, Sigbeku OF. Self rating of oral health status by student dental surgeon assistants in Ibadan, Nigeria – A pilot survey. *Ann Ib Postgrad Med* 2013;11:12-7.
26. Alebiosu CO. Detrimental effects of late referral for dialysis. *Afr J Health Sci* 2001;8:89-92.
27. Lankarani KB, Heydari ST, Aghabeigi MR, Moafian G, Hoseinzadeh A, Vossoughi M. The impact of environmental factors on traffic accidents in Iran. *J Inj Violence Res* 2014;6:64-71.
28. Sarumathi T, Saravanakumar B, Datta M, Nagarathnam T. Awareness and knowledge of common oral diseases among primary care physicians. *J Clin Diagn Res* 2013;7:768-71.
29. Nwhator SO, Olojede CO, Ijarogbe O, Agbaje MO. Self-assessed dental health knowledge of nigerian doctors. *East Afr Med J* 2013;90:147-55.
30. Shah AH, ElHaddad SA. Oral hygiene behavior, smoking, and perceived oral health problems among university students. *J Int Soc Prev Community Dent* 2015;5:327-33.
31. Ali DA. Assessment of oral health attitudes and behavior among students of Kuwait University Health Sciences Center. *J Int Soc Prev Community Dent* 2016;6:436-46.
32. Batidzirai JM, Heeren GA, Marange CS, Gwaze AR, Mandeya A, Ngwane Z, *et al.* Wake-up. A health promotion project for Sub-Saharan University Students: Results of focus group sessions. *Mediterr J Soc Sci* 2014;5:254-346.