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Awareness and method of oral health care among people living with human immunodeficiency virus infection and acquired immune deficiency syndrome attending Federal Medical Centre, Abeokuta, Nigeria

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Original Article

Abstract

BACKGROUND AND AIM: Oral health knowledge and oral health seeking behavior among people living with human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) (PLWHA) have been found to be very low. The importance of education to improve awareness and oral health practices cannot be overemphasized. The study determined the level of awareness, perceived oral status and practices of oral health care among PLWHA attending Federal Medical Centre Abeokuta (FMCA), Nigeria.

METHODS: This descriptive cross-sectional study recruited 204 participants using systematic random sampling technique. The self-designed, pre-tested questionnaire was interviewer-administered by trained research assistants in October 2014 for 4 weeks. All research protocols were strictly adhered to. The data were analyzed with SPSS, chi-square, ANOVA, Fischer's exact test and P value was calculated.

RESULTS: Out of 204 patients, 191, predominantly females 100 (52.4%); married 120 (62.8%), participated, with a response rate of 93.6%. The age range was 18-69 years with a mean of 37.64 ± 11.30 years. Oral health awareness was low 47 (24.6%), but 138 (72.3%) were aware of the role of fluoride toothpaste. Awareness on oral health was statistically significant with the level of education (P < 0.050). The majority 189 (99.0%); 168 (88.9%) used toothbrush, fluoride toothpaste, respectively, 69 (36.1%) brushed at least twice daily, none used dental floss, 14 (7.3%) had visited the dentist within 6 months, and 123 (64.4%) never received dental care.

CONCLUSION: The limited awareness on oral health and its practices can be improved by oral health information and education among the respondents, and further help reduce the severity of some further complications.

KEYWORDS: Oral Health; Awareness; Method; PLWHA

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Oral health remains a problem in many communities around the world particularly among underprivileged groups in developed and developing countries.[1] Some oral problems occur almost exclusively among people living with human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) (PLWHA) while other oral problems have been found to be more severe among PLWHA.[2] A recent study found, the prevalence of oral manifestations associated with HIV to be 30-48%.[3]

Poor oral hygiene increases the risk of oral complications of HIV disease which may result in poorer physical and mental health status.[4] Out of 174 million, about 2.9 million people in Nigeria are estimated to be living with HIV and AIDS.[5] Oral health knowledge and oral health seeking behavior among PLWHA have been found to be very low,[6]

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and poor oral health can significantly affect ones physical and emotional wellbeing.[7] Immune suppressive nature of the disease makes PLWHA a more susceptible to tooth decay and oral manifestations. Oral health awareness and practice were found to be considerably high in studies done in the developed countries.[8,9] Whereas, in Jordan a lower than acceptable level of awareness of periodontal diseases was found among adults;[10] adequate level of knowledge was recorded among a high proportion of Tanzanian students,[11] and among pregnant women in Nigeria.[12] Oral health education is believed to be a cost-effective method for promoting awareness and practice of oral health care.[13] The study determined the level of awareness, perceived oral health status, method of oral healthcare among PLWHA and factors that affect utilization of oral healthcare services.

Methods

Federal Medical Centre Abeokuta (FMCA), a 250-bedded regional specialist hospital is located in one of the 15 wards, Idi-Aba, Abeokuta South Local Government Area of Ogun State, Nigeria.[14] The Department of Community Medicine and Primary Care (CMPC) offers affordable health services including HIV/AIDS, treatment and control of pulmonary and extrapulmonary tuberculosis through community outreach programs, in collaboration with governmental and non-governmental organizations.[14]

As at September 1st 2014, registered PLWHA was 2063, comprising of: 1924 adults and 139 children. Approximately, an average number of patients seen monthly, weekly and daily were 1000, 250, and 50 patients, respectively.

The descriptive cross-sectional survey of registered PLWHA, 18 years and above attending FMCA, recruited 204 eligible, consenting respondents based on calculated minimum sample size.[15] Ethical clearance was obtained from the Health Research and Ethics Committee of the Lagos University Teaching Hospital (ADM/DCST/HREC/APP/2049). All other research protocols were strictly adhered to and confidentiality of respondents assured.

Based on the daily sample frame a clinic day, a systematic random sampling technique was used to administer the self-designed (aided by literature search), pre-tested interviewer-administered study tool by trained research assistants in October 2014 for a period of 4-week.

Data obtained were analyzed using SPSS software (version 17, SPSS Inc., Chicago, IL, USA), frequency, percentage, mean, chi-square, Fischer's exact, ANOVA, and probability were calculated. The questions on awareness were multiple-choice, the answers were dichotomised, and score of one (1) was given to correct response and score of 0 was given to wrong response. Respondents with 0-4 correct responses were regarded to have inadequate awareness while respondents with 5-10 correct responses were regarded to have adequate awareness on the oral health.

Results

A total of 204 participants were recruited into the study with a response rate of 93.6%, and were predominantly female 100 (52.4%) and married 120 (62.8%). The age range was 18-69 years with a mean of 37.64 ± 11.30 years. Almost half 84 (44.0%); 85 (44.5%) and 87 (45.5%) were self-employed; had secondary and tertiary education, respectively (Table 1).

Up to 82 (42.93%) and 73 (38.2%) knew sugar is changed by bacteria into acid which harms the tooth and sugar directly harms tooth enamel, respectively. Concerning plaque, 77 (40.3%) and 67 (35.1%) recognized it as germ containing substance and a harmless substance that can be removed completely with brushing, respectively. Up to 138 (72.3%) were aware of the importance of fluoride in toothpaste, regular flossing 37 (19.4%) but 59 (30.9%) did not know what flossing is. A low proportion of the

respondents correctly cited gingivitis as gum inflammation 58 (30.4%); the most-friendly time to eat sugary treat was along with a meal 36 (18.9%); removal of food and germs as goal of brushing 86 (45.0%); and brushing twice daily and flossing once a day as the two most important dental habits 13 (6.8%). However, 117 (61.3%) could not link gum diseases with associated diseases. The overall perception was low as only 47 (24.6%) demonstrated adequate awareness (Table 2).

Table 1. Distribution of socio-demographic characteristics of respondents

Variable	n (%)
Age (year)	
≤ 20	5 (2.6)
21-30	53 (27.8)
31-40	68 (35.6)
41-50	29 (15.2)
51-60	30 (15.7)
61-70	6 (3.1)
Gender	
Male	91 (47.6)
Female	100 (52.4)
Marital status	
Married	120 (62.8)
Single	49 (25.7)
Separated	7 (3.7)
Divorced/widow	15 (7.8)
Employment status	
Employed	72 (37.7)
Self employed	84 (44.0)
Unemployed	2 (1.0)
Retired	5 (2.6)
Student	28 (14.7)
Level of education	
No formal education	4 (2.1)
Primary school	8 (4.2)
Secondary	85 (44.5)
College/university	87 (45.5)
Postgraduate	7 (3.7)
Total	191 (100)

A large proportion of the respondents 175 (91.6%); 165 (86.4%) and 160 (83.8%); perceived they had 20 or more natural teeth; believed their teeth and gums were above average as it pertains to oral health status. Concerning dentures, 9 (4.7%), 5 (2.6%), and 5 (2.6%) alleged they had partial, full upper and full lower dentures, respectively. Methods of oral healthcare adopted were a clean mouth with toothbrush and paste 189 (99.0%); use fluoride toothpaste 168 (88.9%); and none used dental floss. More than half 109 (57.1%) of the respondents brushed their mouth once a day and 69 (36.1%) twice or more per day. Nearly, two-thirds 123 (64.4%) never received dental care, 14 (7.3%) had visited the dentist within the last 6 months. Reasons for visit were dental problems, treatment and consultation/routine check-up, 24 (35.3%), 10 (14.7%) and 8 (11.8%), respectively (Table 3).

Concerning factors affecting utilization of oral health care, 144 (75.4%) did not access needed dental care. Main reasons for not utilizing needed care were: None affordability of services 17 (11.8%), perceived self-resolution of dental problems 21 (14.6%) and unable to take time off work 7 (4.9%) (Figures 1 and 2).

There was no significant association between oral health awareness and socio-demographics except for the level of education (P = 0.028) (Table 4). Using ANOVA, the mean awareness level was 3.380 ± 1.591 (from the maximum score of 10). A statistically significant relationship was observed between oral health awareness and level of education (P = 0.002). The highest mean awareness on oral health was found among respondents that never cleaned their mouth (5.00) and those that cleaned their mouth only once a week (5.00). Mean awareness was the highest among participants that had visited the dentist within 1-2 years (4.29) followed by those that had visited within the last 6 months (4.14). Participants with a higher education were most aware of oral health when compared with respondents with secondary and primary education for post-hoc test (Table 5).

Discussion

Overall oral health awareness in this study of 47 (24.6%) is lower than 45.5% reported in India,[16] Pakistan (34.5%)[17] but slightly higher than in Nigeria (15.7%).[18] The mean score of

awareness of oral health of the participants was 3.38 (from a maximum score of 10) which is in contrast to the 5.2 (from a maximum score of 8) and 7.2 (from a maximum score of 12) in studies done in Iran,[19] and Peshawar Pakistan,[17] respectively. This difference could be attributed to the study population of these studies which were students. No statistically significant relationship was observed between level of awareness of oral health and age of participants of this study (P = 0.060), in consonance with studies done in Kuwait (P = 0.120),[20] Tanga Tanzania (P < 0.050)[11] and Nigeria (P = 0.573),[18] between the awareness on oral health and the gender (P = 0.838) in line with Nigeria (P = 0.108)[18] and Pakistan.[17]

Table 2. Respondents' oral health awareness

Variable (n = 191)	n (%)
Sugar contribute to tooth decay because	
Sugar directly harm tooth enamel	73 (38.2)
Sugar combines with proteins in saliva to create hard layer on teeth	36 (18.9)
Sugar is changed by bacteria into acid that harms tooth surface	82 (42.9)
Plaque	
The protective coat that naturally occurs on teeth	23 (12.0)
Harmless substance removable by brushing	67 (35.1)
A germ-containing substance on the surface of teeth	77 (40.3)
A whitening substance that makes the teeth shine	24 (12.6)
Flossing	
Regular flossing is an important part of your dental health routine	37 (19.4)
Don't know what flossing is	59 (30.9)
Flossing is bad for your teeth	30 (15.7)
It is ok to floss but must stop if gum bleeds	65 (34.0)
Gingivitis	
Poor support of the bone that supports the teeth	7 (3.7)
A condition where the teeth stain	21 (11.0)
Inflammation of the gums that involves swelling and bleeding !	58 (30.4)
Don't know	105 (54.9)
Most tooth-friendly time to eat sugary treat	
First thing in the morning or last thing at night	53 (27.7)
Along with a meal!	36 (18.9)
As a snack on its own	27 (14.1)
Any time, no difference	75 (39.3)
Goal for tooth brushing	
To remove germ (bacteria) from all tooth surfaces	75 (39.3)
To remove food from tooth surface	9 (4.7)
Not necessarily to remove germ and food	21 (11.0)
To remove germs and to remove food!	86 (45.0)
Link with gum disease	
Low birth weight babies (premature babies)	10 (5.2)
Diabetes	12 (6.3)
Heart disease and stroke	20 (10.5)
None of the above	117 (61.3)
All of the above!	32 (16.7)
The two most important dental health habits	
Brushing twice daily and rising with mouthwash after each brushing	139 (72.8)
Brushing after every meal and using a water-pick device daily	25 (13.1)
Brushing twice daily and flossing once a day !	13 (6.8)
Flossing every day and rising with mouthwash after each flossing	14 (7.3)
Fluoride in toothpaste makes a difference to the health of your teeth	
No it isn't safe	14 (7.3)
Yes improves oral health by decreasing cavities	138 (72.3)
Toothpaste without fluoride is just as effective at preventing cavities	15 (7.9)
Nobody really knows	24 (12.6)

Table 3. Respondents' perceived oral health status and method of oral care

Perceived oral health status	n (%)
Number of natural teeth	
No natural teeth	10 (5.3)
< 20 teeth	6 (3.1)
20 teeth or more	175 (91.6)
Pain or discomfort in the mouth in the past 12 months	
Yes	69 (36.1)
No	122 (63.9)
Teeth status	
Above average	165 (86.4)
Average	22 (11.5)
Poor	9 (4.7)
Type of dentures	
Partial denture	9 (4.7)
Full upper denture	5 (6.2)
Full lower denture	5 (6.2)
Method of oral care	
Frequency of cleaning the mouth	
Never	3 (1.6)
Once a month	4 (2.1)
Once a week	2 (1.0)
2-6 times a week	4 (2.1)
Once a day	109 (57.1)
Twice or more a day	69 (36.1)
Material used to clean the mouth (multiple responses)	
Tooth brush	189 (99.0)
Wooden tooth picks	31 (16.2)
Plastic toothpicks	6 (3.1)
Dental floss	0 (0.0)
Charcoal	3 (1.6)
Chewing stick	17 (8.9)
Use of toothpaste to clean mouth	
Yes	189 (99.0)
No	2 (1.0)
Use of fluoride toothpaste	
Yes	168 (88.9)
No	16 (8.5)
Don't know	5 (2.6)
Last dental visit	
< 6 months	14 (7.3)
6-12 months	4 (2.1)
> 12 months	11 (5.8)
Never	123 (64.4)
Reason for last visit (multiple responses) (n = 68)	
Consultation/advice	8 (11.8)
Treatment	34 (50.0)
Routine check-up	8 (11.8)

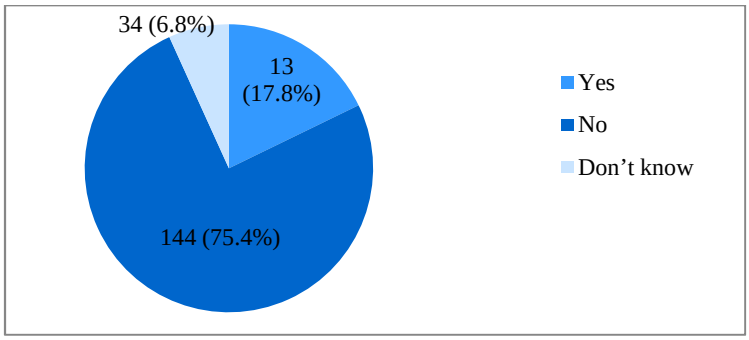

Figure 1. Need for oral health services

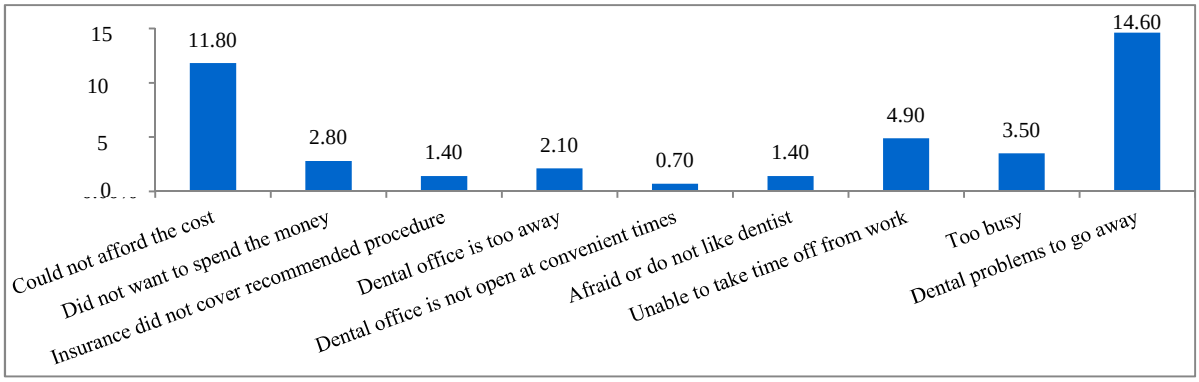

Figure 2. Reasons for not utilizing oral health services

Table 4. Association of level of oral health awareness with some variables

Variable	Awareness [n (%)]		Total [n (%)]	P
	Inadequate	Adequate		
Age group (year)				
≤ 20	5 (100.0)	0 (0.0)	5 (100)	0.060*
21-30	34 (64.2)	19 (35.8)	53 (100)	
31-40	49 (72.1)	19 (27.9)	68 (100)	
41-50	26 (89.7)	3 (10.3)	29 (100)	
51-60	24 (80.0)	6 (20.0)	30 (100)	
61-70	6 (100)	0 (0.0)	6 (100)	
Sex				
Male	68 (74.7)	23 (25.3)	91 (100)	0.838**
Female	76 (76.0)	24 (24.0)	100 (100)	
Employment status				
Employed	52 (72.2)	20 (27.8)	72 (100)	0.306*
Self-employed	67 (79.8)	17 (20.2)	84 (100)	
Unemployed	2 (100)	0 (0.0)	2 (100)	
Retired	5 (100)	0 (0.0)	5 (0)	
Student	18 (64.3)	10 (35.7)	28 (100)	
Level of education				
No formal education	4 (100)	0 (0.0)	4 (100)	0.028*†
Primary school	6 (75.0)	2 (25.0)	8 (100)	
Secondary school	72 (84.7)	13 (15.3)	85 (100)	
College/University	58 (66.7)	29 (33.3)	87 (100)	
Postgraduate	4 (57.1)	3 (42.9)	7 (100)	
Cleaning mouth with toothpaste				
Yes	143 (75.7)	46 (24.3)	189 (100)	0.433*
No	1 (50.0)	1 (50.0)	2 (100)	
Use of fluoride toothpaste				
Yes	125 (74.4)	43 (25.6)	168 (100)	0.597*
No	14 (87.5)	2 (12.5)	16(100)	
Last dental visit				
< 6 months	6 (42.9)	8 (57.1)	14 (100)	0.058*
6-12 months	3 (75.0)	1 (25.0)	4 (100)	
1-2 years	5 (71.4)	2 (28.6)	7 (100)	
2-5 years	10 (83.3)	2 (16.7)	12 (100)	
> 5 years	27 (87.1)	4 (12.9)	31 (100)	
Never	93 (75.6)	30 (24.4)	123 (100)	
Materials used to clean the mouth (multiple responses)				
Toothbrush	143 (75.7)	46 (24.3)		0.001*†
Wooden toothpicks	20 (10.5)	11 (5.8)		
Plastic toothpicks	2 (1.0)	4 (2.1)		
Charcoal	3 (1.6)	0 (0.0)		
Chewing stick	9 (4.7)	8 (4.2)		
Total	144 (75.4)	47 (24.6)	191 (100)	

*Fisher's exact P value, **Chi-square P value, †Statistically significant

Table 5. Analysis of variance of oral health awareness and some variables

Variable	n	Mean ± SD	F	P
Age (year)				
≤ 20	5	2.20 ± 0.447	2.243	0.052
21-30	53	3.83 ± 1.707		
31-40	68	3.46 ± 1.501		
41-50	29	2.97 ± 1.210		
51-60	30	3.17 ± 1.895		
61-70	6	2.67 ± 1.033		
Gender				
Male	91	3.41 ± 1.619	0.041	0.840
Female	100	3.36 ± 1.573		
Marital status				
Married	120	3.31 ± 1.494	1.695	0.170
Single	49	3.55 ± 1.803		
Separated	7	4.43 ± 1.397		
Widowed	15	2.93 ± 1.580		
Employment status				
Employed	72	3.57 ± 1.471	1.161	0.329
Self-employed	84	3.12 ± 1.609		
Unemployed	2	3.00 ±0.000		
Retired	5	3.40 ± 1.342		
Student	28	3.71 ± 1.863		
Level of education				
No formal education	4	1.00 ± 1.155*	4.458	0.002†
Primary school	8	2.75 ± 1.753**		
Secondary school	85	3.16 ± 1.454**		
College/University	87	3.71 ± 1.606***		
Postgraduate	7	4.00 ± 1.528***		
Frequency of cleaning mouth				
Never	3	5.00 ± 1.000	2.192	0.057
2-3 times a month	4	4.00 ± 2.309		
Once a week	2	5.00 ± 0.000		
2-6 times a week	4	3.50 ± 1.000		
Once a day	109	3.52 ± 1.507		
Twice or more a day	69	3.00 ± 1.663		
Use of toothpaste				
Yes	189	3.37 ± 1.595	0.997	0.319
No	2	4.50 ± 0.707		
Use of fluoride toothpaste				
Yes	168	3.48 ± 1.555	3.057	0.050
No	16	2.50 ± 1.506		
Don't know	7	3.00 ± 2.160		
Dental visit				
< 6 months	14	4.14 ± 1.703	1.958	0.0870
6-12 months	4	3.25 ± 1.893		
1-2 years	7	4.29 ± 1.254		
2-5 years	12	3.42 ± 1.084		
> 5 years	31	2.81 ± 1.833		
Never	123	3.39 ± 1.529		
Total	191	3.38 ± 1.591		

*, **, *** not significant different at 0.05. †ANOVA P value, participants with higher education were most aware of oral health when compared with respondents with secondary and primary education

Almost three-quarter of the study population 138 (72.2%) were aware of the importance of fluoride in toothpaste, slightly less than the 92.3% observed in the study done in Kuwait[20] but far greater than the 5.0% in China.[21] Almost half (46.0%) of the respondents of an Indian study were aware of dental flossing[22] which is higher compared to the 37 (19.4%) that were aware of dental flossing in this study. The difference can be attributed to the level of dental health services and awareness in study locations.

Less than half 82 (42.9%) of the participants were aware of the harmful effect of sugar on the teeth when converted by bacteria to acid, compared to 62.3% reported in the Belarus study,[23] which consisted of school teachers and mothers, who perhaps better informed with up to date oral health information. The proportion of participants 77 (40.3%) that recognized plaque as a germ containing substance that collects on the surface of the teeth, is in line with the study done in Kuwait (40.6%)[20] but much higher than China (16.0%)[21] and North Jordan (14.9%).[24] The observed difference could be attributed to a greater sample size in these studies (577 in the North Jordan study and 4398 in the Chinese study). Again, less than half 86 (45.0%) of the respondents were aware of the goal of tooth brushing, which may be a reflection of the low level of dental care services and client education when compared with 89.0% reported in a study in the United States.[25] In the United States study, only 22.0% were aware of the most "tooth friendly" time to take sugar or sugar treat,[25] almost at par with this study 36 (18.8%). The best ways to perform oral hygiene were recognized by only 13 (6.8%) of the respondents, and this is a pointer to the very low awareness when compared to the Brazilian study with 95.0%.[26]

The slightly higher proportion of respondents that were aware of gingivitis in Batangas City, Philippines (48.4%)[27] compared to 58 (30.4%) in this study may be due to better oral health awareness/client education. A lot more needs to be done, as only 32 (16.8%) of the study population could link low birth weight, heart diseases and diabetes with gum disease, compared with the United States of America study with 37.0%,[25] which perceivably is also considering the higher level of oral health services, awareness and education.

The majority of participants 163 (86.4%) perceived the condition of their teeth as above average, this is slightly higher than India, (66.0%)[28] but lower still (36.8%) in the United States.[29] This difference may be due to dietary differentials and larger sample sizes. More than half 109 (57.1%) brushed their teeth once a day comparable with the Iranian study (55.0%).[19] One-third 69 (36.1%) brushed their mouth twice or more a day as generally recommended in consonance with studies in India[20] and Kuwait.[28] However, the higher figure found in the Saudi Arabian study (66.5%)[30] may be attributed to better awareness and higher level of dental services; India (81.9%)[16] may be due to the urban community, and the Philippines (75.2%)[27] was due to assess to the Dental Health Program of a dental school. The use of toothbrush 189 (99.0%) and fluoride toothpaste 168 (88.9%) was a gold standard for cleaning the mouth by the respondents, in line with the Iranian study with (92.3%).[19] None of the respondents had ever used dental floss and its underutilization was reported in North Jordan (2.0%)[24] and China (4.0%)[31] as well. A high proportion 123 (64.4%) of the respondents had never visited the dentist for dental care, as reported in a Nigerian study.[32] Among those that visited, only 14 (7.3%) visited the dentist within the last 6 months, a big disparity with Pakistan (42.5%);[20] obviously due to a better dental practice and awareness.

Up to 34 (17.8%) of the respondents did not have access to needed oral health services which is in line with the 11.8% in North Jordan,[24] the reason of which high cost of

dental treatment was cited by 17 (11.8%) of the participants in this study, in consonance again with North Jordan[24] and Philippines[27] (11.7 and 12.9%), respectively. There was no statistically significant relationship observed between oral health awareness and dental visits, cleaning the mouth and use of toothpaste; which are similar with studies done in Pakistan,[20] India[16] and Nigeria,[33] respectively.

Conclusion

Oral health awareness was low. However, 138 (72.3%) of the respondents were aware of the importance of fluoride toothpaste, 168 (88.9%) used fluoride toothpaste, only 69 (36.1%) brushed at least twice daily, and none of the participants used dental floss. Utilization of dental service was low. Comprehensive oral health education program for all PLWHAs and wider dental care coverage by health insurance are programs for improvement.

Conflict of Interests

Authors have no conflict of interest.

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