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### Abstract

**Purpose:** The objective of this study was to determine the oral health status in HIV positive patients attending Port Reitz Hospital in Mombasa County.

**Methodology:** The study adopted a descriptive cross-sectional study design. Clients 18 years and above who are HIV positive at the comprehensive care clinic of the Port Reitz Hospital were the population under study. A total of 372 patients were interviewed. Clinical data was collected using a WHO oral health assessment questionnaire and observations on knowledge, attitudes and practice and social demographics were made using a second questionnaire. Data collected was cleaned and keyed into an MS Excel spread sheet then exported to SPSS version 20 for analysis. The findings were presented using frequency tables, bar charts and pie charts. Measures of association were computed at the corresponding 95% confidence intervals.

**Findings:** The prevalence of dental caries among patients at Port Reitz Hospital was 14.2% with the proportion experiencing - decay, missing and filled teeth due to caries being 11.1%, 7.1% and 9.1%, respectively. The DMFT index in this population was not significantly related to age, sex and ART status of the patients. Of the 368 patients, 39.3% had healthy teeth. Conversely, 5.8% had bleeding gums, 13.8% had calculus, 36.5% had pockets (4-5mm) and 0.2% had pockets (6 or more than 6mm). Findings indicated that 6.3% of the patients had access to information on HIV related oral diseases. With regard to knowledge on oral diseases, the three most commonly known oral disease related to HIV were bleeding gums (28.3%), cavities (17.0%) and ulcers (15.1%). 99.5% of patients in the study expressed a need for more information on oral diseases related to HIV. Most of the patients (98.9%) regarded treatment of oral diseases as important as treatment in other parts of the body. When asked about their practice, 63.6% Of clients in the study said that they cleaned their teeth more than once a day using tooth brushes (96.3%).

**Contribution to practice and policy recommendation:** The recommendation from the study is that oral health care and treatment should be included as part of comprehensive care for HIV patients. These patients should be given information on oral diseases related to HIV and oral health care and maintenance.

**Keywords:** *Dental caries, Periodontal disease– Human Immunodeficiency Virus – Oral Health Knowledge, Attitude and Practice*

## **1.0 BACKGROUND INFORMATION**

The HIV/AIDS epidemic is one of the most serious to have affected humanity. About 40 million people were infected with HIV in 2001, and millions have already died of AIDS. Many more people are affected because their parents, other family members, friends and co-workers have died of AIDS or are infected with HIV<sup>1</sup>. National programmes, international organizations, civil society, communities and individuals have responded to the epidemic. The initial efforts were often weak and scattered as the full nature and scope of the threat had not been fully understood. As the epidemic has progressed, understanding of its complex causes and effects has increased. The WHO Oral Health Programme can make important contributions to the early diagnosis, prevention and treatment of this disease. WHO oral health programme is a global oral health policy that emphasizes that oral health is integral and essential to general health and that oral health is a determinant factor for quality of life<sup>2</sup>. A number of studies have demonstrated that 40-50% of HIV-positive persons have oral fungal, bacterial or viral infections, often occurring in the early stages of the disease<sup>3</sup>.

Oral manifestations such as candidiasis and hairy leukoplakia are common lesions found in patients infected with human immunodeficiency virus<sup>4</sup>. Those who are on antiretroviral drugs may demonstrate various orofacial effects. Since the first reported case of HIV infection in the United States in 1981, a large body of research has propelled the accumulation of knowledge on many aspects of this disease. For dentists, the oral manifestations among HIV/AIDS patients in the pre-antiviral era have not been well recognized<sup>5</sup>.

Studies in patients receiving highly active antiretroviral therapy (HAART) have revealed a decreased prevalence of common oral lesions that previously defined HIV status. However, HIV salivary gland diseases and oral warts have reportedly been on the rise<sup>6</sup>. Immune reconstitution syndrome, a condition whereby the recovering immune system responds to previously acquired pathogens with an overwhelming inflammatory response, is also increasingly reported<sup>7</sup>. The effects of HAART on a patient's immune response require further investigation to determine the extent to which oral manifestations are attributable to adverse drug effects, and if so, to find means to mitigate these effects. Oral adverse effects from drugs, as well as oral manifestations in patients with immune reconstitution syndrome, need to be generously investigated in order to fully comprehend the effect of drugs for proper and safe usage in the future<sup>8</sup>.

## **2.0 MATERIALS AND METHODS**

### **2.1 Study Site**

The study was conducted at the Port Reitz County Hospital Comprehensive Care Clinic (CCC) located in Chagamwe Sub-County, Mombasa County. The hospital has a catchment Population of 68,000. Port Reitz Hospital was selected as a study site being the largest county referral facility in Mombasa County<sup>9</sup>. The hospital catchment population is varied and includes at risk populations such as long distance truck drivers, as well as employees of the various industries and container terminals. Port Reitz Hospital has departments such as maternity, maternal and child care, clinical care, comprehensive care clinic, support services, rehabilitative services,

nutrition, medical social work services, mental unit and nursing services. At the time of the study 2,360 patients were registered at the comprehensive care clinic.

## **2.2 Study Population**

The study population was adult patients between the ages of 18 and above, who were HIV positive attending the CCC at Port Reitz Hospital.

## **2.3 Target Population**

The target population were adult patients above the ages of 18 years who were HIV positive.

## **2.4 Study Design**

The study adopted a descriptive cross-sectional study design to determine the oral health status of HIV positive patients visiting the facility at that particular time.

## **2.5 Sample Size Determination**

The sample size was determined by using formula<sup>10</sup> for a population 10,000 and more, thus:-

$$n = \frac{Z^2 (P) (1-P)}{d^2}$$

Where n is the minimum sample size required, Z is the corresponding level of confidence desired which is (95%=1.96) for this study. P is the expected proportion of individuals in the sample with the characteristic of interest (default = 50%) d= maximum tolerable error=5% q=100-50=50%

$$n = \frac{(1.96)^2 * (0.5) * (0.5)}{(0.05)^2}$$

$$n = 385$$

## **2.6 Sampling Technique**

Systematic random sampling was used in order to provide HIV positive patients equal opportunity to participate in the study. The total number available as per a list pertaining to the age group under study was 2360. The sampling interval was 6.13 (2360/385) and hence every 7<sup>th</sup> patient who met the inclusion criteria was selected. The first participant was randomly selected among the first group of patients that arrived on the first day of sampling.

## **2.7 Data Collection tools**

Primary data from clinical examination was collected using a WHO Oral Health structured questionnaire on, history of dental diseases identified as variables in the study. Clinical examination was done with the help of an assistant. A second questionnaire was used to collect primary data on patient demographics, knowledge, attitudes and practice.

## **2.8 Data management and Analysis**

The questionnaires were inspected for completeness before data entry. Data was stored in password protected computer hard disk while the raw data was stored in lockable safes after data entry to ensure the security of the collected data. Quantitative data was cleaned and entered on MS- Excel spreadsheet then exported to Statistical Package for Social Sciences (SPSS) version 20 for analysis. In analysing data for the Likert scale questions, reliability of the responses was first tested and evaluated at Cronbach's<sup>11</sup> alpha=0.7. Cronbach's alpha is a measure of the

consistency or reliability of a test scale and is expressed as a number between 0 and 1 (Cronbach). Univariate analysis (descriptive statistics) and bi-variate analysis (chi square test) was carried out to show the interaction between various variables in the study.

## 2.9 Ethical Considerations

The study was approved by the Pwani University Ethics Review committee. The research procedures were undertaken in a way that ensured that ethical requirements were upheld. The major ethical issues considered were; no coercion, informed consent, privacy and confidentiality, anonymity and preservation of human dignity. Potential participants had the opportunity to make their decision to participate in the study based on adequate knowledge about the study, as provided for in the informed consent in Appendix 2. Participants benefitted by being made aware of their oral health status and treatment choices available at the hospital's dental clinic where they were referred for management. There was no physical and psychological risk or harm suffered by the participants in this study as the nature of questions asked were not likely to hurt feelings and the dental examination was done in a way that protected them from any physical harm.

## 3.0 RESULTS

Out of the calculated sample size of 385, the study successfully surveyed 368 and therefore a response rate of 95.6% was realised. Out of the 368 HIV positive patients recruited at Port Reitz Hospital, 231 (62.8%) were female while 137 (37.2%) were male. Most of the patients, 143 (39.4%) were aged 35-44 years, followed by those aged 45-54 93 (25.6%) and 25-34 years 86 (23.7%). With regard to marital status, 238 (64.5%) of these patients were married, 54 (14.6%) were single while 11 (3.0%) were divorced, 38 (10.3%) were separated and 28 (7.6%) were widowed.

Findings indicated that 102 (27.6%) of the patients were unemployed 121 (32.8%) were on full-time employment 13 (3.5%) were on part time employment and 130 (35.2%) were engaged in business as a source of income. In addition, majority 197 (53.4%) had studied up to primary level, 119 (32.8%) up to secondary level, 22 (6.1%) had tertiary level of education. Conversely, 6.9% had no formal education (Table 1).

In determining the prevalence of dental caries among the patients selected, crown and roots of selected teeth were examined. To begin with, the crown of the teeth of the sampled patients was examined and the findings indicate that in the 1<sup>st</sup> quadrant, 320 (92.2%), 244 (68.7%) of the 2<sup>nd</sup> and 7<sup>th</sup> teeth were found to be in sound condition. The same teeth (2<sup>nd</sup> and 7<sup>th</sup>) were found to be decayed in 20 (5.4%) and 98 (27.6%) of the respondents and missing in 7 (1.9%) and 12 (3.4%) respectively. The corresponding teeth (22 and 27) in the 2<sup>nd</sup> quadrant were found to be sound in 323 (93.6%) and 237 (66.8%) of the respondents respectively. Findings show that 46 (12.5%), 31 (8.9%) and 31 (8.9%) of the patients, 8<sup>th</sup>, 6<sup>th</sup> and 5<sup>th</sup> tooth were missing due to caries. In the second quadrant, 123 (34.4%), 99 (27.9%) and 43 (12.3%) of the patients, the 8<sup>th</sup>, 7<sup>th</sup> and 6<sup>th</sup> teeth were found to be decayed and 50 (14%), 17 (4.8%) and 40 (11.4%) of the same teeth were found to be missing as a results of caries.

In the 3<sup>rd</sup> quadrant, the 2<sup>nd</sup> and 7<sup>th</sup> teeth were sound in 326 (96.7%) and 204 (58%) of the respondents. In the 3<sup>rd</sup> quadrant, the 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> teeth were caries among 66 (18.8%), 103 (29.3%) and 125 (34.7%) of the patients with 50 (14.2%), 42 (11.9%) and 58 (16.1%) of the same set of teeth in the same quadrant missing due to carries as is shown in table 2 below. The 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> teeth in the 4<sup>th</sup> quadrant were carious among 63 (17.7%) 101 (28.3) 142 (38.5%), of the patients with the same set of teeth observed to be missing due to carries for 50 (14.1%), 39 (10.9%) and 54 (14.6%) of the patients respectively.

**Table 1: Socio demographic characteristics of the selected patients**

Socio Demographic characteristics:	Patients (frequency)	Proportions (%)
<b>Sex of the respondents (n=368)</b>		
Male	137	37.2
Female	231	62.8
<b>Age in Years (n=368)</b>		
18-24	19	5.2
25-34	86	23.7
35-44	148	40.2
45-54	93	25.6
55-64	16	4.4
65-74	5	1.4
75-84	1	.3
<b>Marital Status (n=368)</b>		
Married	237	64.4
Single	54	14.6
Divorced	11	3.0
Separated	38	10.3
Widowed	28	7.6
<b>Employment Status (n=368)</b>		
Employed Part time	13	3.5
Employed Full time	120	32.8
Unemployed	102	27.6
Business	130	35.2
Retired	1	.3
Student	2	.5
<b>Highest Level of education (n=368)</b>		
No formal Education	25	6.8
Primary Level	202	55.0
Secondary Level	119	32.3
Diploma	21	5.7
Degree	1	.3

**Table 2: Status of crown of the teeth among sampled patients**

Status of teeth crown:	Sound	Decayed	Filled, Caries	Missing, Caries
18 (n=368)	188 (51.0%)	134 (36.4%)	-	46 (12.5%)
17	244 (68.7%)	98 (27.6%)	-	12 (3.4%)
16	273 (78.7%)	43 (12.4%)	-	31 (8.9%)
15/55	285 (81.4%)	34 (9.7%)	-	31 (8.9%)
14/54	293 (79.2%)	35 (9.5%)	-	20 (5.4%)
13/53	328 (94.0%)	14 (4.0%)	-	7 (2.0%)
12/52	320 (92.2%)	20 (5.4%)	-	7 (1.9%)
11/51	313 (86.2)	23 (6.3%)	-	5 (1.4%)
21/61	311 (89.9%)	24 (6.9%)	-	7 (2.0%)
22/62	323 (93.6%)	16 (4.6%)	-	5 (1.4%)
23/63	326 (94.2%)	11 (3.2%)	-	8 (2.3%)
24/64	303 (87.6%)	26(7.5%)	-	16 (4.6%)
25/65	288 (82.8%)	29 (8.3%)	-	31 (8.9%)
26	266 (76.0%)	43 (12.3%)	-	40 (11.4%)
27	237 (66.8%)	99 (27.9%)	-	17 (4.8%)
28	175 (48.9%)	123 (34.4%)	1 (0.3%)	50 (14.0%)
48	161 (43.6%)	142 (38.5%)	-	54 (14.6%)
47	216 (60.5%)	101 (28.3%)	-	39 (10.9%)
46	241 (67.9%)	63 (17.7%)	-	50 (14.1%)
45/85	310 (89.9%)	29 (8.4%)	1 (0.3%)	4 (1.2%)
44/84	324 (95.0%)	14 (4.1%)	1 (0.3%)	1 (0.3%)
43/83	327 (96.2%)	10 (2.9%)	-	2 (0.6%)
42/82	326 (96.2%)	9 (2.7%)	-	2 (0.6%)
41/81	325 (95.9%)	11 (3.2%)	-	2 (0.6%)
31/71	323 (95.6%)	12 (3.6%)	-	1 (0.3%)
32/72	326 (96.7%)	7 (2.1%)	-	1 (0.3%)
33/73	330 (97.6%)	6 (1.8%)	-	1 (0.3%)
34/74	327 (96.5%)	10 (2.9%)	-	1 (0.3%)
35/75	306 (90.0%)	26 (7.6%)	-	7 (2.1%)
36	233 (66.4%)	66 (18.8%)	1 (0.3%)	50 (14.2%)
37	204 (58.0%)	103 (29.3%)	2 (0.6%)	42 (11.9%)

38                      165 (45.8%)      125 (34.7%)      2 (0.6%)                      58 (16.1%)

**Table 3: Recommended treatment based on the status of the crown and root**

<b>Treatment recommended:</b>	<b>One surface filling</b>	<b>Two Surfaces</b>	<b>Veneer</b>	<b>Crown for any reason</b>	<b>Extraction</b>	<b>Other Care</b>
18 (n=368)	75 (25.1%)	2 (0.7%)	-	-	8 (2.7%)	1 (0.3%)
17	63 (22.1%)	1 (0.4%)	-	-	3 (1.1%)	4 (1.5%)
16	22 (7.7%)	-	-	-	12 (4.2%)	13 (4.6%)
15/55	14 (4.9%)	-	-	-	9 (3.2%)	16 (5.6%)
14/54	20 (7.1%)	1 (0.4%)	-	-	7 (2.5%)	8 (2.9%)
13/53	3 (1.1%)	-	-	-	1 (0.4%)	3 (1.1%)
12/52	5 (1.8%)	-	-	1 (0.4%)	1 (0.4%)	6 (2.1%)
11/51	14 (5.0%)	1 (0.4%)	-	-	2 (0.7%)	2 (0.7%)
21/61	5 (1.8%)	-	1 (0.4%)	3 (1.1%)	4 (1.4%)	-
22/62	6 (2.1%)	-	-	1 (0.4%)	1 (0.4%)	2 (0.7%)
23/63	1 (0.4%)	-	-	-	1 (0.4%)	3 (1.1%)
24/64	8 (2.8%)	-	-	-	3 (1.1%)	7 (2.5%)
25/65	12 (4.3%)	1 (0.4%)	10 (3.6%)	-	9 (3.2%)	-
26	22 (7.9%)	-	-	-	11 (3.9%)	15 (5.4%)
27	54 (19.1%)	1 (0.4%)	-	-	4 (1.4%)	12 (4.2%)
28	72 (25.7%)	-	-	-	9 (3.2%)	11 (4.0%)
48	76 (24.8%)	2 (0.7%)	-	-	6 (2.0%)	5 (1.6%)
47	61 (21.2%)	2 (0.7%)	-	-	4 (1.4%)	11 (3.8%)
46	27 (9.5%)	1 (0.4%)	-	-	7 (2.5%)	16 (5.6%)
45/85	18 (6.4%)	1 (0.4%)	-	-	-	2 (0.7%)
44/84	7 (2.5%)	1 (0.4%)	-	-	-	-
43/83	3 (1.1%)	-	-	-	-	3 (1.1%)
42/82	1 (0.4%)	-	-	-	-	3 (1.1%)
41/81	1 (0.4%)	-	-	-	-	2 (0.8%)
31/71	3 (1.1%)	-	-	-	-	1 (0.4%)
32/72	1 (0.4%)	-	-	-	1 (0.4%)	1 (0.4%)
33/73	-	-	-	-	-	-
34/74	3 (1.1%)	-	-	-	-	1 (0.4%)
35/75	16 (5.8%)	-	-	-	2 (0.7%)	1 (0.4%)
36	32 (11.5%)	3 (1.1%)	-	-	7 (2.5%)	21 (7.6%)
37	64 (22.9%)	3 (1.1%)	-	-	3 (1.1%)	14 (5.0%)
38	68 (24.2%)	2 (0.7%)	-	-	9 (3.2%)	8 (2.9%)



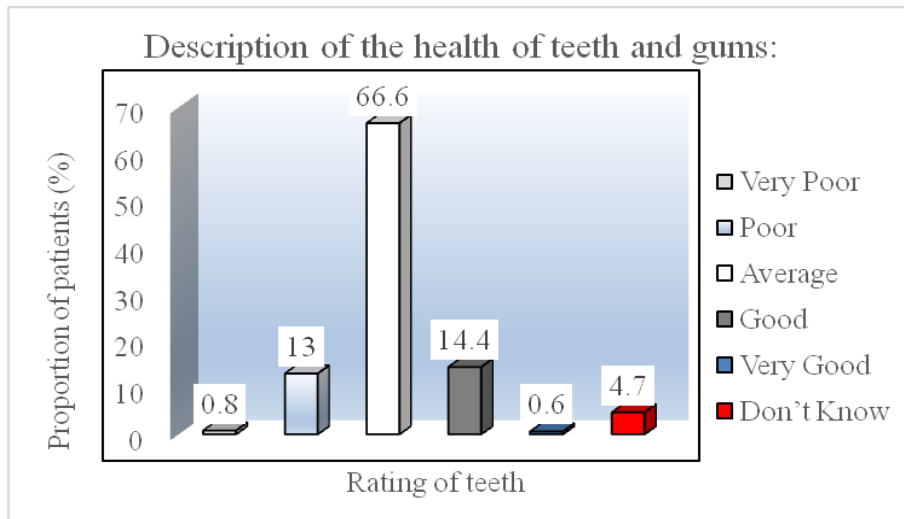
After examination of the selected teeth of sampled patients, treatment was prescribed based on the observed and recorded status of each of the teeth. Majority of the patients received one surface filling as treatment for their dental status in the 7<sup>th</sup> (22.1%, 75) and 8<sup>th</sup> 63(22.1%) teeth in the 1<sup>st</sup> quadrant, 7<sup>th</sup> 54(19.1%) and 8<sup>th</sup> 72(25.7%) teeth in the 2<sup>nd</sup> quadrant, 7<sup>th</sup> 64 (22.9%), 8<sup>th</sup> 68(24.2%) in the 3<sup>rd</sup> quadrant and 7<sup>th</sup> 76 (24.8%), 8<sup>th</sup> 61 (21.2%) in the 4<sup>th</sup> quadrant.

Findings in the study indicated that the following teeth needed two surface fillings; 8<sup>th</sup>, 7<sup>th</sup>, 4<sup>th</sup> and 1<sup>st</sup> teeth in the 1<sup>st</sup> quadrant, the 5<sup>th</sup> and 7<sup>th</sup> teeth in the 2<sup>nd</sup> quadrant, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> teeth in the 3<sup>rd</sup> quadrant and the 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> teeth in the 4<sup>th</sup> quadrant required two surface fillings. The average number of decayed teeth was 3.12 (SD=2.45), missing teeth 2.56 (SD=1.98) and filled teeth 1.33 (SD=0.58). The DMFT index was 3.98 (SD=3.21). These indices were based on a rating where 0 to 4.9 was considered very low, 5 to 8.9 was considered low, 9 to 13.9 moderate and 14 to either 28 or 32 were interpreted as high as recommended by Cappelli *et al.* (2007).

Bi-variate analysis (chi square) was conducted to find out if there were any significant relationships between the DMFT indices and age, sex and whether or not the patients had already been enrolled on ARTs. At 5% level of significance, DMFT index among the patients was established not to be significantly related to age ( $\chi^2$  (18) = 17.556, p=0.485), sex ( $\chi^2$  (3) = 3.669, p=0.300) and ART status of the patients ( $\chi^2$  (3) = 2.158, p=0.540).

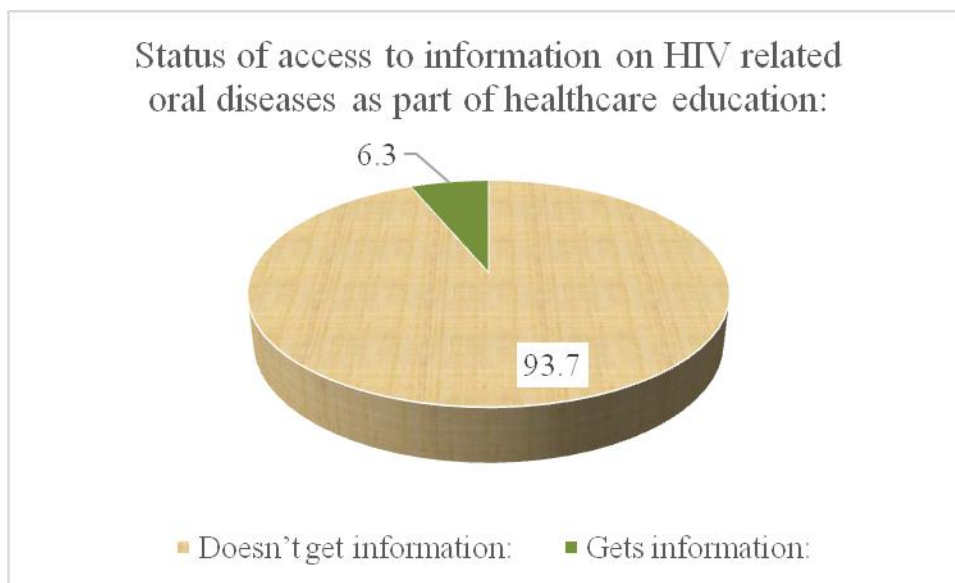
Selected teeth as per the WHO oral assessment questionnaire were examined for periodontal diseases. In the 1<sup>st</sup> quadrant, the 1<sup>st</sup>, 6<sup>th</sup> and 7<sup>th</sup> teeth were selected; in the 2<sup>nd</sup> quadrant it was the 6<sup>th</sup> and 7<sup>th</sup> teeth; in the 3<sup>rd</sup> quadrant, it was the 1<sup>st</sup>, 6<sup>th</sup> and 7<sup>th</sup> teeth and finally in the 4<sup>th</sup> quadrant, it was the 6<sup>th</sup> and the 7<sup>th</sup> teeth examined. Findings in the 1<sup>st</sup> quadrant for the 6<sup>th</sup> and 7<sup>th</sup> teeth indicate that 111(30.0%) were healthy, 26 (7.1%) had bleeding gums and 200 (54.5%) had pockets 4-5mm. In the 2<sup>nd</sup> quadrant the same teeth, 112 (30.5%) were found to be healthy, while 28 (7.6%) had bleeding gums and 195 (53.1%) had pockets 4-5mm. Still on the 6<sup>th</sup> and 7<sup>th</sup> teeth but in the 3<sup>rd</sup> quadrant, 93 (25.3%) of patients had healthy teeth, 30 (8.2%) had bleeding gums, 20 (5.4%) had calculus, and 202 (55.0%) had pockets 4.5mm. Findings on the same set of teeth, the 6<sup>th</sup> and 7<sup>th</sup>, in the 4<sup>th</sup> quadrant, show that 100 (27.2%) healthy teeth, 27 (7.4%) had bleeding gums, 24 (6.5%) had calculus and 195% (53.1%) patients had pockets 4.5mm in size as shown in table 4.4 below. The mean number of teeth with healthy gums was 2.36 (SD=1.82), bleeding gums were 0.35 (SD=1.10), with calculus were 0.83 (SD=0.98), pockets 4-5mm 2.19 (SD=1.73), and pockets 6 or more than 6mm were 0.01 (SD=0.14).

When the respondents were examined for the condition of the oral mucosa and particularly for candidosis the study revealed that 6 (1.8%) of the respondents had oral candidosis. The majority 355(96.4%) of the respondents were found in the study to have no abnormal conditions. The study found that for the majority 241 (66.6%), the health of their teeth and gums was average, good 52 (14.4%) and poor 47 (13.0%) as shown in figure 1 below.



**Figure 1: Patients’ description of the health of their teeth and gums**

The study findings were that 341(93.7%) of the patients did not have access to such information while 23 (6.3%) of the patients had access to information as is shown in figure 2 below.



**Figure 2 Access to information on HIV related oral diseased as part of health education**

The respondents were then exposed to 5 -3 point likert statements. The study indicated that for 360 (99.4%), teeth were an important part of the body whereas for 351(97.1%) daily cleaning of the teeth prevented dental caries. The study also found that for 347(95.9%), regular visit to the dentist helped to keep teeth in healthy state and 322 (89.0%) stated that consuming sweetened

food products or drinks could cause dental caries. When asked if using fluoridated toothpaste was good for the teeth 253(69.7%) said the statement was true though 101(27.8%) of patients did not know whether or not using fluoridated toothpaste was good for their teeth.

In regards to the quality of life affected by the oral health status in the 6 months preceding the study, majority 289 (78.3%) did not experience any difficulty in eating and chewing food while 329 (89.4%) did not experience problems with cleaning their teeth. The study found that 322 (87.7%) had no difficulty in sleeping and relaxing and 352 (96.2%) were able to smile and show their teeth without embarrassment. 296 (80.9%) of the respondents had no difficulty maintaining usual emotional state, 352 (95.9%) enjoying contact with other people and 328(89.4%) carrying out major work and social roles.

The study however found that 40 (10.8%) did have difficulty in eating and chewing food on a daily basis, 14 (3.8%) of the patients less than once in a month, 14 (3.8%) once or twice a week and 12 (3.3%) of the patients once or twice a month within the 6 months before the study. Difficulty in cleaning teeth were experienced by 23 (6.3%) of the patients on a daily basis, 8 (2.2%) of the patients less than once a month, 6 (1.6%) of the patients once or twice a month and by 2 (0.5%) of the patients once or twice a week. The study showed that difficulty in sleeping and relaxing were experienced by 14 (3.8%) of the patients on a daily basis, by 12 (3.3%) of the patients less than once a month, 13 (3.5%) of the patients once or twice a month and by 6 (1.6%) of the patients once or twice a week. Difficulty in smiling and showing teeth without embarrassment were experienced by 9 (2.5%) of the patients on a daily basis, by 3 (0.8%) of the patients less than once a month, 1 (0.3%) of the patients once or twice a month and by 1 (0.3%) of the patients once or twice a week.

## **4.0 DISCUSSION, CONCLUSION AND RECOMMENDATION**

### **4.1 Discussion**

The study assessed the oral health status in human immunodeficiency virus positive patients attending Port Reitz Hospital.

The study revealed that in Port Reitz Hospital, there were twice as many female as male HIV patients who visited the facility to seek comprehensive care. Majority of these patients were aged between 45 and 54 years while more than 6 out of 10 were married. The results of the present study showed two trends of the AIDS epidemics: the aging of the infected population due to higher survival rates<sup>12</sup> and the feminization<sup>13</sup>. Similar studies in Africa showed a higher proportion of females than males<sup>14,15</sup>. The study showed that majority of the respondents were in some form of employment, full time, part time or business. More than half of the respondents had gone up to primary level of education compared to the few who have gone beyond primary and secondary level of education.

Most of these patients have sound teeth translating into low DMFT index (3.98) with the majority of the patients having lower than 5 decayed, missing and filled teeth due to caries. On average just 3.12 (SD=2.45) teeth were decayed, 2.56 (SD=1.98) teeth were missing teeth and 1.33 (SD=0.58) teeth had been filled due to caries among all the patients whose teeth were

examined. This is in contrast to a study in Brazil<sup>16</sup> which observed a high prevalence of caries with a mean DMFT = 23 (D = 12; E = 7.5; Ei = 1.5; F = 2) in 123 adult patients of both sexes.

On the periodontal index the study revealed that a large number of the respondents had no abnormal conditions, while a lower percentage had bleeding gums, calculus on their teeth, and gingival pockets 4.5mm. The majority had pockets more than 6mm and thus the majority had periodontitis. The study revealed that a low proportion of respondents had oral candidosis. The majority of the clients had no abnormal conditions detected. The introduction of highly active antiretroviral therapy may have led to the decreased incidence of oral candidiasis<sup>17</sup>.

Majority of the patients were already on ART at the time of the study. Majority of the patients considered the health of their teeth and gums as average with a few of the patients having access to information on HIV related oral diseases as part of health care education. Majority of the respondents had no knowledge of any oral diseases associated with HIV. A study<sup>18</sup> showed that 37 % of patients were reported as knowledgeable while 63% of patients were non knowledgeable on HIV associated oral diseases.

The three most commonly known oral disease related to HIV is bleeding gums cavity and ulcers though mention was made of decaying, painful teeth, sensitivity, tooth ache, gum disease, bad breath, dental pain, fluorosis and rushes. Close to all the patients desire more information on oral diseases related to HIV. Majority of the patients considered oral health care as a high priority with a similar proportion considering treatment in the oral cavity as important as treatment in other parts of the body. For the majority of the respondents, cleaning of teeth was something they did more than once a day using tooth brush as opposed to other methods such as charcoal.

The study shows that the majority of the patients had in the previous 12 months before the study not visited a dentist, with the three main reasons being their own neglect of the pain they experienced, while some said they had not experienced painful teeth and others did not see the need to visit a dentist. A study in Malaysia on people living with HIV associated oral lesions found that two thirds of patients (66%) reported that they would seek professional care while 34% patients reported not seeking professional care<sup>18</sup>. This is in contrast to this study finding which may be attributed to lack of knowledge on the part of the respondents.

The respondents who used tobacco products were 11% while 7.8% used other products such as alcohol, bhang and mirraa. Studies done in the pre ART era had demonstrated increased HIV related complications in HIV positive smokers<sup>19</sup>. The impact of tobacco use on outcome in HIV patients has not been examined post ART era<sup>20</sup>. Cessation of smoking and other related products by HIV patients would however result in improved outcomes<sup>21</sup>.

Majority of the patients felt that teeth are an important part of the body and daily cleaning of the teeth could prevent dental caries. Regular visit to the dentist helped to keep their teeth in healthy state while consuming sweetened food products or drinks caused dental caries and finally that using fluoridated toothpaste was good for teeth. Oral health is seen from a health perspective as a balance between destructive factors such as sugar-rich diet, tobacco use, and poor oral hygiene

versus protective factors including good oral hygiene and the application of fluoride, whether in toothpaste, rinses or varnishes, or in community drinking water<sup>22</sup>.

Access to information was significantly related to knowledge of oral diseases related to HIV perceptions towards oral healthcare as a priority and to frequency of cleaning teeth. Most of the patients who had access to information on HIV related oral disease as part of healthcare education knew at least some oral disease related to HIV and treated oral health care as a priority. Those who did not have access to information did not know any oral disease related to HIV. Empowering patients with knowledge is associated with adherence to a variety of medical recommendations, including those for HIV clients. Providers should ensure that each patient has the information needed for reasoned decision-making<sup>23</sup>.

#### **4.2 Conclusion**

For the majority of the respondents the teeth were sound with but there was increased prevalence of caries in the posterior teeth compared to the anterior teeth. Majority of the clients had more posterior teeth missing than the anterior teeth. Overall the DMFT index was lower than due to lower occurrence of decay missing and filled teeth. The common periodontal condition was bleeding gums and periodontal pockets found in a high number of respondents. These are conditions that can be prevented with patient education on appropriate oral practices. The fewer number of respondents with oral candidosis may be attributed to the use of HAART for management of HIV virus. Oral health education is not adequately provided as the majority did not know there were oral diseases associated with HIV. Improving knowledge for the respondents would lead to improved attitudes and practice towards oral health care

#### **4.3 Recommendations**

There is need for oral health care to be integrated as part of HIV care for all patients. Structured educational programs and that can empower patients with knowledge and ensure that the patient has an access to the right information needed for decision-making should be developed. It is recommended to provide the PLWHA with the proper knowledge in regards to the HIV/AIDS associated oral lesions and oral health.

A more detailed study should be carried out among the HIV patients at Port Reitz Hospital to establish the clinical factors that may have contributed to the patients on ARV having lower rates of oral conditions.

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