Factors Contributing To Oral Diseases and Treatment Needs amongst Mental Patients at Chainama Hills College Hospital, Lusaka, Zambia

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ABSTRACT:

Objective: This study was to determine the factors contributing to oral diseases amongst the mental patients and their treatment needs at Chainama Hills College Hospital (CHCH), Lusaka, Zambia.

Methods: A hospital based descriptive study was conducted from April to June, 2017 on both institutionalized and non-institutionalized patients of above 18 years who were accessing mental health services at CHCH. A simple random sampling technique was executed to collect data. A total of 162 participants were interviewed and intra oral examinations were done to measure indices of oral health: Decayed, Missing, and Filled Teeth (DMFT) index and Community Periodontal Index (CPI). Oral examination was performed using disposable dental mirrors, probes and cotton tweezers. Bivariate and cross tabulations analyses were performed for independent correlations by using SPSS 16.0 statistical software.

Results: Of the total 162 study participants, the majority were men who represented 105(64.8%) and females were 57(35.2%). The mean age was 35 years and the mode age was 30 years. The mean DMFT score among the psychiatric patients was 3.18 with 0.65, 0.0¹ and 0.28 for Decayed, Missing and Filled Teeth respectively. Periodontal pockets measuring between 4-5 mm deep were detected on 137(84.6 %) of the 162 study participants. The association between age and dental visits with DMFT showed a statistically significant Pearson correlation at P=0.001 and P= 0.003 respectively. Patients with smoking habits demonstrated none significant Pearson correlation with CPI indicating P =0.809. There was an association between level of education and CPI which indicated the correlation which was statistically significant at P= 0.017 level (2-tailed). Bivariate analysis to determine the association between age and CPI showed a statistically significant Pearson correlation at P =0.05 level (2-tailed). A cross tabulation between gender and DMFT demonstrated that the men were more likely to suffer from dental caries than females. The majority (92.2%) of study participants who were diagnosed with periodontal diseases needed scaling and polishing. Dental fillings were required on 55.6 % of the 162 participants who presented with dental caries. Only 11.7 % of the psychiatric patients had a healthy CPI score of zero and required no treatment apart from hygiene instructions.

Conclusion: The study found poor oral health amongst the patients that were accessing psychiatric services at Chainama Mental Hospital. The majority of participants had extensive periodontal and dental treatment needs. Therefore, an upstream approach to the management of the factors contributing to oral diseases in mental patients could be developed whereby specific oral health promotion activities should be implemented in order to improve oral care in this disadvantaged population.

Introduction

Oral diseases remain a major public health problem in the world. Though they are not life threatening, their high prevalence and incidence, cause severe pain resulting in suffering and loss of functions to those who are affected predominantly the vulnerable and socially disadvantaged in the society ¹. Oral health signifies being free of chronic oral-facial pain conditions, oral and pharyngeal cancers, oral soft tissue lesions, birth defects (such as cleft lip and palate) and other disease and disorders that affect the oral, dental, and craniofacial tissues ². Oral diseases affect the significant percentage of the world population and exert a substantial toll in terms of mortality and morbidity ³. The greatest burden of oral diseases is on the disadvantaged and socially marginalized populations according to The World Oral Health Report ¹.

A study on oral health status of mentally disabled subjects in India by Manish et al. indicated a high correlation between poor oral hygiene and development and progression of periodontal disease
amongst mental patients. Studies which were conducted in other countries such as Denmark and United States of America (USA) in psychiatric hospital showed that psychiatric illness can influence the oral health status of psychiatric inpatients. Among outpatients, research also confirmed that psychiatric patients have more severe oral health problems than the general population. An analysis of the results from a study which was conducted in Nigeria showed high caries prevalence, poor oral hygiene, poor periodontal health, and a high level of unmet dental treatment needs among patients receiving psychiatric care at Lagos State University Teaching Hospital (LASUTH). Zambia is one of the few countries in Africa that does not have current data on the oral health status of the mental illness population implying that the situation is likely to be worse in terms of the status of the oral health conditions amongst this marginalized population.

People with severe mental illness are prone to oral diseases for a number of factors which include amotivation, poor oral hygiene, fear, specific dental phobia, dental costs, difficulty in accessing healthcare facilities and the side-effects of psychiatric drugs such as dry mouth or xerostomia. A range of diseases and conditions can be classified as oral diseases which can include dental caries, periodontal diseases, oral cancers, noma, dental erosions and dental fluorosis. Dental caries and periodontal disease are the two most common diseases that affect oral health of mental patients and up to 90% of the world population could be affected with periodontal diseases demonstrating the high rates of infection. In more advanced disease there is exposure of tooth roots and mobility of teeth. If left untreated, it can lead to progressive damage of the alveolar bone around the teeth, subsequently loosening and (edentulousness) loss of teeth. In other words, it should not merely be assumed that diseases in the mouth “would not be expected to have effects elsewhere in the body”. Additionally, it has been noted that periodontal disease and cardiovascular disease share related risk factors, which may be the underlying causative relationship instead of periodontal disease itself. Dental caries is the outcome of the demineralization of enamel and dentine by acids produced as by-products of the metabolism of fermentable carbohydrates by dental plaque microorganisms. This results in cavitation of specific sites on the tooth surface and as a consequence produces pain and unsightly teeth. Good oral hygiene alone is normally unsatisfactory to prevent tooth decay. Treatment of dental caries, once it has produced a cavity, involves either the restoration or extraction of affected teeth and the incidence of missing teeth can be high in mental patients according to a study done by Sjørgen and Nordstrom.

Conversely, evidence suggests that mental patients have a greater risk of suffering from oral problems and have higher oral treatment needs. The oral care needs of many of those affected by psychiatric disorders have for a long time been neglected owing to lack of knowledge, terror, stigma, misconception, and negative attitudes. Research has shown that this population has several teeth extracted, untreated carious teeth, severe periodontal diseases, poorer oral hygiene, less filled teeth and incidence of xerostomia, burning and tingling in the mouth or halitosis and taste disorders. Delta Dental stated that well over 100 medical conditions, including some life-threatening conditions, can be detected in the early stages by a dentist. Poor oral care can also contribute to oral cancer, and untreated tooth decay can lead to tooth abscess, tooth loss, and in the worst cases serious destruction of the jawbone.

Presently in Zambia, oral health has less priority in the context of mental illness as there is no deliberate policy on the National Health Strategy Plan (NHSP, 2011-2015) which suggests the integration of oral health with mental patients. According to the previously conducted action plans at Chaiamana Hills College Hospital (CHCH), the records on the budgets did not include the provision of oral health promotions activities on mental patients. To the best of my knowledge, there is no available information on the health information system (HMIS) at both CHCH and the Provincial Health Office (PHO) with regards to the oral health status of patients with mental disorders at CHCH in Lusaka, Zambia.

Methods

A hospital based descriptive cross-sectional study was conducted at CHCH in Lusaka, the capital of Zambia between April and June, 2017. This Psychiatric Hospital was chosen because it is the only mental hospital offering referral psychiatric services across the country. This type of research design allows for the examination of a sample of a population at one point in time according to Babbie. Mann indicated that a cross-sectional study design is the best way to determine prevalence and is also convenient in identifying possible associations that can be studied in more detail later using a cohort study or randomized controlled research design.

The study population consisted of the adult (18 years and above) psychiatric patients accessing psychiatric services at CHCH that included both the institutionalized and the out-patients of the eligible total of 162 mental patients. The patients in the correctional facility at CHCH were also included in
this study population. The study population considered the re-attendant patients at CHCH from the first quarter of 2017 which was approximately 1390 patients according to the hospital register.

Simple random sampling was used in this study since the subjects to be investigated were all mental patients who were accessing the mental services at CHCH which was used as the sample frame of the study. The aim of selecting a sample randomly was to eradicate the risk of bias, and the belief behind a random sample was that every member in the study population had a more than zero chance of being selected. This sampling technique was used in order to investigate a particular aspect of mental patients who are accessing the mental services at CHCH by the type of the psychiatric diagnosis that had passed the inclusion criteria. From the types of psychiatric diagnosis, it was easy to randomly select an appropriate number as representatives of the population (sample) that were invited to take part in the research study. The research study considered that every third patient on the list was invited to take part in the study, but in an event that the patient was not qualifying to be included because of some reason then the fourth patient stood a chance of being invited to take part in the study.

**Results**

The total sample size was 311. From these eligible study subjects, 42 (13.5%) showed lack of interest and refused to participate, exacerbation of illness on the day of examination was the other reason for not participation on 67 (21.5%), 21 (6.8%) were unable to give consent and 19 (6.1%) were uncooperative and difficult to convince during the time of intra oral examination. As a result, the final study group included 162 (52.1%) study participants.

The age of the respondents which was categorized and the most frequent age were between 25-34 indicating 59 (36.4%) and those that aged 55 years and over represented 10 (6.2%). The males recorded the highest number of participants indicating 64.8 % and the rest were females with 35.2%.

Table 1 demonstrates that the highest number of the mental patients were diagnosed with Schizophrenia indicating 125 (77.2%) followed by Bipolar disorders with 31(19.1%) and the rest were diagnosed with Depressive disorders representing 6(3.7) participants. The table also highlights that the highest number of patients who were receiving antipsychotics drugs indicated 121(74.7 %) such as haloperidol, chlorpromazine and risperidone, followed by the patients who were on mood stabilizers at 30(18.5%) amongst them sodium valproate. Only 11(6.8%) were on antidepressants such as Amitriptyline. The categorized duration of treatment indicated that 50% of the respondents were on treatment between 1 to 6 months and the rest were on treatment at least 7 months. The minimum and the maximum duration on treatment amongst the participants fell between 2 weeks and 17 years.

**Table 1. Distribution of the respondents’ medical records.**

<table>
<thead>
<tr>
<th>Psychiatric Diagnosis</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenia</td>
<td>125(77.2)</td>
</tr>
<tr>
<td>Bipolar disorder</td>
<td>31(19.1)</td>
</tr>
<tr>
<td>Depressive disorder</td>
<td>6(3.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>162(100.0)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prescribed drugs</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antipsychotics</td>
<td>121(74.7)</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>11(6.8)</td>
</tr>
<tr>
<td>Mood stabilizers</td>
<td>30(18.5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>162(100.0)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration on treatment</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6 months</td>
<td>81(50)</td>
</tr>
<tr>
<td>7+ months</td>
<td>77(47.5)</td>
</tr>
</tbody>
</table>

According to table 2, the mean duration on treatment of the respondents was 14.4 months, with the mode indicating 2 months and the minimum and maximum duration on medication indicated between 1 and 204 months respectively.

**Table 2. Distribution the respondents’ duration on treatment in months by measure of central tendency and spread.**

<table>
<thead>
<tr>
<th>N</th>
<th>162</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>14.36</td>
</tr>
<tr>
<td>Median</td>
<td>6.00</td>
</tr>
<tr>
<td>Mode</td>
<td>2</td>
</tr>
<tr>
<td>Range</td>
<td>203</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
</tr>
<tr>
<td>Maximum</td>
<td>204</td>
</tr>
</tbody>
</table>

The figure 1 below shows that 36.4% of the respondents stated that state of their gums were fair
and 2.5% said that the state of their teeth were excellent 26.5% reported that their state of the teeth was good and 30.9% of the respondents reported the state of their teeth as being poor.

Figure 1. Percentage distribution of respondents’ self-reported state of the teeth.

This finding shows that the majority of the participants of at least 60% reported their state of teeth either being fair or poor meaning that of the participants had poor oral hygiene.

Figure 2 shows that 34% of the respondents stated that their gums were fair and only 2.5% said that the state of their gums was excellent. Poor state of the gums was reported on 25.9% of the respondents and 31.5% stated that their gums were good. According to this finding, it means that the majority had poor oral hygiene due to the infection in their gums.

Figure 2. Percentage distribution of respondents’ self-reported state of the gums.

Figure 3 shows that the majority of respondents of 117 responded to cleaning their teeth twice or once a day and those responded by saying that they never brushed their teeth were 17 in total. Only 3 participants out of the total 162 indicated that they brushed their teeth once a month. Despite these claims by the study participants, upon intra oral examination it was discovered that majority had poor oral hygiene reason being that lack of access to tooth brushes mostly in those who were hospitalized.

Table 3 presents that 113 (69.8%) study participants never visited or received any dental care followed by 13.6% who only visited a dentist at least 5 years ago and 1.2% of the respondents only visited a dentist more than one year but less than 2 years. This result donates lack of dental care utilization in mental patients due to their state of the illness being one of the factors to the development of oral diseases.

Table 3. Participants’ response on when they last visited a dentist or hygienist.

Table 4 shows that the majority of the respondents 112 (69.1%) said never to smoking and those who agreed to smoking represented 50 (30.9%). This result could mean that amongst those indicated never to smoking said so because they never had access to smoking owing to the hospital regulations which bans the patients from smoking.

Table 4. Percentage distributions on the participants’ response to smoking.
The total 162 study participants who experienced toothache in the last 4 months prior to the study represented 99 (61.1%) and this result could indicate lack of access to dental services by the mental patients. Bleeding gums were experienced by 68 participants out of the total 162 representing 42%, followed by the majority of the respondents who experienced dry mouth totaling 108 (66.7%) out of 162 participants and finally bad breath was felt on 99 (61.1%) respondents. The dry mouth experience could indicate the side effects of the antipsychotic and antidepressant drugs prescribed for mental patients. The bad breath was due to fact that these people having poor oral hygiene because of lack of access to dental care. There was no association between bad breath and for both DMFT and periodontal health with Pearson correlation showing a non-significant r = 0.918 and P =0.008 for DMFT and periodontal health at r = 0.228 and P= 0.104. The responses for having pain were combined for statistical DMFT and periodontal health analysis. Bivariate analysis revealed no association between the experiences of toothache over the past four weeks and the DMFT score or periodontal health.

Figure 4 below shows that of the total of 162 participants, 48 (29.6%) recorded a DMFT score of 0. The highest DMFT score of 14 was recorded on only 3 (1.9%) participants.

Table 5 shows that the mean DMFT was 3.17, with median recording 3.0, the mode was 0.00 and the standard deviation was 3.3. The DMFT score of the study subjects ranged from 0 to 14. The sum of decayed, filled and missing teeth was 106, 46 and 2 respectively on all participants.

Table 5. Measure of central tendency of total DMFT (n=162).

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>50</td>
</tr>
<tr>
<td>No</td>
<td>112</td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
</tr>
</tbody>
</table>

Table 6 shows the periodontal condition of participants measured by CPI and it presents that from the total of 162 study participants 19 (11.7%) had a CPI-0 indicating a healthy periodontium, 142 (88.2 %) of the total population of the respondents had bleeding on probing (CPI-1), calculus (CPI-2) was present on 45 (28.1%) of the total participants,137(84.6 %) had shallow pockets of 4-5mm (CPI-3), and 12(7.6 %) had deep pockets measuring ≥ 6mm (CPI-4).

Table 6. Percentage distribution on CPI.

<table>
<thead>
<tr>
<th>CPI</th>
<th>Frequency %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI 0 (Health periodontium)</td>
<td>19 (11.7%)</td>
<td>162(100%)</td>
</tr>
<tr>
<td>CPI 1 (Bleeding gums)</td>
<td>142 (88.2 %)</td>
<td>162(100%)</td>
</tr>
<tr>
<td>CPI 2 (Presence of calculus)</td>
<td>45 (28.1%)</td>
<td>162(100%)</td>
</tr>
<tr>
<td>CPI 3 (Pockets depth 4-5mm)</td>
<td>137(84.6 %)</td>
<td>162(100%)</td>
</tr>
<tr>
<td>CPI 4 (Pocket depth of ≥ 6mm)</td>
<td>12(7.6 %)</td>
<td>162(100%)</td>
</tr>
</tbody>
</table>

Bivariate analysis was used to do the analysis in order to determine the association between the dental carries status (DMFT) and socio-demographic characteristics. The relationship between DMFT score was statistically significant at the 0.05 level (2-tailed) in relation with age at P= 0.01 level (2-tailed) and gender was not statistically significant. Marital status and educational level were not statistically significant (P>0.05). The self-reported state of the teeth according to Pearson correlation with DMFT was statistically significant at P =0.04.
Bivariate analysis was used to determine the association between the age of the participants and the CPI and it showed that Pearson correlation was significant at the 0.05 level (2-tailed). A significant increase in the severity of periodontal problems was seen with increasing age. Gender and duration of treatment showed that Pearson correlation was not statistically significant (P >0.05). There was an association between level of education and CPI which indicated the correlation was significant at the 0.05 level (2-tailed) while the marital status and the employment status showed that level was not statistically significant.

In order to determine the association between the frequency of tooth brushing and DMFT score, the bivariate analysis was used and it demonstrated a negative Pearson correlation at P= 0.7. Weak correlation with P>0.05 between DMFT and for both last visit to a dentist and on how many times per week the study participants took sugary drinks or coffee/tea.

Table 7, shows a cross tabulation between gender and DMFT. Of the total of 105 males, the highest number of study participants recorded a DMFT of 1 and 5 indicating 47 and females had a DMFT on 34 participants on the same category. The males recorded DMFT greater than females as presented in the table of between DMFT between 11-14 with females represented by only on 1 (1.8%) participant and for males in 5 (4.8%) participants.

Table 7. Gender of the respondents* DMFT category - Cross tabulation.

<table>
<thead>
<tr>
<th>DMFT CATEGORY</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1-5</td>
<td>105</td>
</tr>
<tr>
<td>6-10</td>
<td>5</td>
</tr>
<tr>
<td>11-14</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 8 shows the cross tabulation of the CPI-0 and the duration on treatment and it shows that those who were on treatment between 1- 6 months were less likely to suffer from periodontal disease than those that were on treatment at least 7 months.

Table 8. CPI-O * Duration of treatment -Cross tabulation.

<table>
<thead>
<tr>
<th>Duration of treatment</th>
<th>CPI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6 months</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7+ months</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5 shows that amongst the total population of 162 participants who had bleeding gums, presence of calculus and periodontal pockets, the major treatment needed was T3 (scaling and polishing) on 92.2 % of the study participants.

Dental fillings (T2) were needed on 55.6 % of the total participants who presented with dental caries, 30.7% required tooth extractions (T1) amongst all the participants who had returned roots or root stumps or teeth with cannot be filled and finally the 11.1% required prosthesis treatment (T4) or artificial teeth from the 162 participants who had missing teeth on intra oral examination. However, only 4.4% out of the total 162 participants who presented with no oral health problem required no treatment (T0).

Discussion

Oral health and quality oral health care add to holistic health, which should be considered as a right rather than a privilege. This is a reason why the individuals with mental disabilities deserve the same opportunities for dental services as those who are healthy. The information in this study was collected from mental patients who were accessing mental services at Chainama Hills College Hospital. This study reports an outline of the factors contributing to periodontal diseases and dental caries of psychiatric patients in the perspective of limited attention for the psychiatric aspect of dentistry in Zambia.
mainstream of participants had extensive periodontal and dental treatment needs, as presented by a high number of untreated dental carious lesions, bleeding gums, dry mouth, calculus, snacking, and irregular dental utilization patterns. Additionally, the key outcomes of this study revealed that reduced access to dental care, frequency snacking between meals, and age were contributing factors for poor oral health. The duration of treatment of the patients was not a factor for poor oral health among patients in this study. Patients at the mental health centre deprived of a dental care facility were most likely to have poor oral health due to their being less likely to have regular dental care visits.

Of the 162 patients who participated in this study 105 (64.8%) were males and 57 (35.2%) represented the females. The majority number of the study participants was diagnosed with schizophrenia indicating 125 (77.2%). The majority of previous studies on the oral health of the institutionalized psychiatric patients as well indicated schizophrenia as the most common psychiatric disorder among their sample populations. In this study, there were more participants from younger age groups as compared to the overall patient population of the institution and similar past studies with an average age of 34.64 as in this study. This was largely owing to the fact the majority of the excluded patients were older adults diagnosed with dementia and it was also reported on similar studies involving older populations as well as those patients on alcohol related conditions 6, 26-27.

The duration of treatment for the sample population ranged from 1 month to 17 years. The duration of treatment for this study was lower than expected in earlier studies such as in a study by Velasco et al (1997) where almost 88% of the participants had a length of hospitalization and treatment of between 16 to 67 years. 25. Nevertheless, in studies by Angelillo et al. (1995) and Hede (1997) the length of hospitalizations and treatment for 44% and 46.5% of patients was more than 10 years. 26, 29 Several of the previous studies did not include the duration of treatment as part of their analysis, thereby excluding the effect of long-term inpatient care on oral health 6.

The oral health statuses of the 162 participants were measured using the DMFT and the CPI indices. The mean DMFT in this study was 3.18 and about 52% of the participants had DMFT of 1 to 14. This study recorded less DMFT score contrary to findings from other studies that reported higher mean DMFT score of up to 24. 6, 7, 30-32. According to Pearson correlation the findings showed that there was no significant association which observed with sex, duration of treatment and DMFT in the present study with P = 0.807 and P=0.456 respectively.

In the present study, the findings on the mean number of filled teeth were far less than the missing teeth and this is in line with other studies where the mean number of filled and decayed teeth in these studies was far less than the mean number of missing teeth. The exact reason of this difference has not been investigated; nonetheless, most studies have suggested that extraction was often preferred to more conservative treatment. The authors of these studies propose that dentists are less keen to capitalize in complex conservative or rehabilitative treatments due to problems in handling psychiatric patients 29, 32.

The mean number of decayed teeth in this study was 0.65. In contrast, it was lower than studies reported by Jovanovic´ et al. (2010), Zusman et al. (2010) and Ramon et al. (2003) 7, 30, 31. A mean number of 0.26 in missing teeth was also reported in this study and it was lower than studies conducted in Israel 31, Serbia 30 and South Wales 6. The mean number of filled teeth was 0.01. This finding was lower than studies by Lewis et al. (2001) and Zusman et al. (2010) 6, 31.

Results of the cross tabulation showed that DMFT was associated with sex of study participants, with males appearing in having high DMFT scores between 11-14 in 3 male participants than in ladies which indicated zero in the highest DMFT score and this result was in line with the study done by Jovanovic´ et al. (2010) 30.

The link of anti-depressant treatment was in agreement with a study done in Serbia 30. This could probably be because of anti-psychotropic and anti-depressant medications which can lead to reduced saliva consequently causing xerostomic effects and exposing study subjects to dental caries 19. The majority of psychiatric patients in the study population were prescribed with a number of psychotropic drugs with 66.7 % of patients complained of having a “dry mouth”.

The DMFT score was also different among patients diagnosed with different psychiatric disorders. Patients with Schizophrenia had significantly high DMFT score in range of between 11-14. The effect of different psychiatric disorders on oral health has not been investigated. Given the complexity and variability of psychiatric disorders, it may not be possible. The results of the present study found no association between the psychiatric disorders and DMFT and this finding is in line with Velasco et al. (2010) and Ramon et al. (2001) who as well analyzed the oral health status in relation to different psychiatric disorders with no significance detected in the DMFT scores 7, 27. In the study by Thompson et al. (2003) stated that patients diagnosed with chronic Schizophrenia were attributed to the sterness of
The results on the bivariate analysis of the self-reported oral health status question showed that the 36.4% and 30.9% of the patients who reported their oral health as poor or fair respectively. The strong association between DMFT and self-reported oral health status according to Pearson correlation was significant at the P≤ 0.05 level (2-tailed). This is in line with a study by Locker et al. (1988) which indicated a strong association among a group of older Canadians 35.

The majority of psychiatric patients in the present study were prescribed a number of psychiatric drugs known to have xerostomic effects. Actually, 66.7 % of patients complained of having a ‘dry mouth’. These results are in line with a study by Locker (2003) which showed about 51% of the study participants experienced dry mouth as shown in institutionalized elderly population which demonstrated that lack of proper oral prosthesis, xerostomia, and missing teeth are contributors to having a compromised functioning and to an extent a reduced oral health-related quality of life 36.

Bivariate analysis indicated that patients who reported having a toothache had non-significant association with DMFT contrary to the study done by Locker and Miller (1994) which demonstrated a significance association with DMFT. On the contrary to the previous reported study, patients who reported being sensitive to hot or cold foods or drinks had a non-significant association with higher number of filled teeth according to a bivariate analysis 37.

The self-reported frequency of tooth brushing indicated that patients accessing mental health services were unlikely to have brushed at least once a day. The Pearson correlation demonstrated a statistically significant association at P≤ 0.05 between the development of dental caries and tooth brushing frequency was in this study. A number of issues can influence both frequency of tooth brushing and how dependable a response can be obtained from a person with a mental condition.

In the present study about 30.9% of patients interviewed reported smoking. It was learnt during the interviews that majority of the patients who agreed to smoking were out patients as they had access to cigarettes than the hospitalized ones. It is well known fact according to research that smoking can lead to adverse effects in the oral cavity 37-38. Recent data suggested that in Canada, smokers had higher odds of reporting oral-facial pain, and that edentulism was at 15% among current smokers 37. However, no indices were used in this study to determine the adverse effects of smoking in oral health.

The outcome of snacking or taking of sugary drinks on the oral health of mental patients had not been studied previously. Increased frequency of snacking was not related to poor oral health in bivariate analysis which showed a Pearson correlation at r = 0.20 which was non-significant at P=0.091.

Several studies have been conducted in recent years with main focus on the psychosocial etiology of periodontal health 39. Mental patients constitute an exceptional group that has been known to have deficits in the areas of thought, behavior, and efficacy, these shortfalls weaken their capabilities to appreciate the importance of oral health, practice good oral self-care, and utilize health care 40. The management of periodontal health complications among the mentally ill will not only contribute to raising the standards for their oral health but also will positively affect their quality of life 41.

In this study, the highest score of a sextant was recorded as the presence of the periodontal condition. Community periodontal index discovered poor periodontal condition out of the total study psychiatric patients which showed healthy gingival in only 11 % of the subjects. These findings are similar to those reported by Angelillo et al. (1995) and Rekha et al. (2002) apart from the percentage of subjects with deep pockets was lower and the percentage with shallow pockets higher in the present study 19,29.

In the present study periodontal health was statistically significant associated with age at P= 0.041 according to Pearson correlation (r = 0.161) where it was observed that older patients had a greater percentage of patients suffering from periodontal infections than the younger patients. This observation elucidates chronic cumulative damaging pattern of periodontal diseases 42. The findings in this study relate to the other studies which reported corresponding rises in periodontal diseases with age 17,43.

There was an observed association between CPI and highest level of education showing a Pearson correlation (r = -0.204 and P=0.017), while the association between CPI and gender was not significant according to Pearson correlation recording (r = -0.026 and P =0.746) which was contrary to other studies which reported males considered to be the most affected sex such as in a study conducted in Serbia in 2010 44. A study by Jovanovic et al. (2010) similarly reported that male gender was associated with poor periodontal status in a logistic regression model they developed which...
was similar to this study in which a cross tabulation was done between periodontal health and gender.  

In this study, the clinical outcomes revealed that the major treatment needed amongst the study participants was scaling and polishing which was discovered in 92.2% of the study participants with poor periodontal health. This is in line with reports derived from other studies which found extraordinary number of patients needing periodontal treatment. About 4.4% of the study participants had a health periodontium (CPI-0) required no treatment but were advised oral hygiene instructions and those who needed fillings amongst those with dental caries represented 55.6%. Tooth extractions were indicated on 30.7% of the patients who had either retained roots or sever dental caries and teeth replacements were advised on 11.1% of the subjects with missing teeth. However, some participants required multiple treatments similarly to the other studies in 17% of the participants. The probable justification for high complex treatment need is weakened self-care ability among the mental patients and side effects of their medicine in oral health. The results, as shown in this population, exhibit lack of proper oral prosthesis, untreated dental caries, xerostomia, and missing teeth are contributors to having a compromised functioning and to an extent a reduced oral health-related quality of life.

**Conclusion**

The study found poor oral health among the patients who were accessing psychiatric services at Chainama Hills College Hospital. The majority of participants had extensive periodontal and dental treatment needs, as presented by a high number of untreated dental carious lesions, bleeding gums, dry mouth, calculus, snacking/taking sugary drinks, and irregular dental utilization patterns. Additionally, the key outcomes of this study revealed that reduced access to dental care, frequency snacking between meals, level of education, age and the lack of a preventative dental care program were contributing factors for poor oral health. The duration of treatment of patients was not a factor for poor oral health among patients in this study.

**References**