

Oral Hygiene Status, Practices and Awareness of Medium Security Prison Inmates in Northeastern Nigeria

Idowu Enoch A¹, Afolabi Adedapo O² and Solomon Olusegun Nwhator^{3*}

¹Faculty of Dentistry, University of Jos, Nigeria

²Dental Center, Federal Medical Center, Owo, Nigeria

³Department of Preventive and Community Dentistry, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria

***Corresponding Author:** Solomon Olusegun Nwhator, Senior Lecturer and Specialist-Consultant Periodontologist, Department of Preventive and Community Dentistry, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria.

Received: January 09, 2019; **Published:** February 26, 2019

Abstract

Introduction: Nigerian prisons house several inmates either convicted after trial or awaiting trial. The oral health of these prisoners has generated concern in recent times. The researchers decided to investigate the oral hygiene status, practices and awareness of prisoners in a North-eastern Medium Security Prison.

Methods: This was a cross sectional survey of prisoners in a Medium Security Prison located in Bauchi, Bauchi state, Northeastern Nigeria using simple random sampling.

Results: Close to 90% of the inmates were male and most(58.2%) of the inmates had no formal education. The most popular form of oral hygiene practice was the use of finger and water only. Though being more of a religious practice for ablution rather than an oral hygiene practice, it was the only means of oral hygiene practice by a majority of the prisoners. There was a significant relationship between oral hygiene practice and educational level ($p = 0.001$). Educational attainment had an impact on caries experience. While close to 70% of those without formal education had dental caries, close to 70% of those with tertiary level of education were caries free ($p = 0.001$). About 64.4% of prisoners who used finger and water only experienced dental caries. About 77% of the prisoners also had had periodontal problems.

Conclusion: Most of the prisoners used primitive, ineffective oral hygiene practices and suffered from dental caries and periodontal diseases. There was a significant relationship between caries experience and educational level as well as between type of oral hygiene practice and caries experience.

Keywords: Oral Hygiene; Medium Security Prison; Inmates

Introduction

The prison community is a place of legal confinement for crimes committed or while awaiting trial [1] often associated with social deprivations, especially the loss of freedom for a specific period of time. The Nigerian Prison Service takes custody of inmates with the vision of reformation, rehabilitation and reintegration [2]. Without prejudice to allegedly committed offenses, the right to good quality health care must be respected as indicated by the United Nations Standard Minimum Rules (SMR) for treatment of offenders [3]. Despite this, the literature suggests poor general and oral health conditions of prisoners compared with the general population in many countries [4-9]. Poor oral hygiene practices, inappropriate diet, smoking, drug intake as well as poor oral health awareness, knowledge and attitude

have been widely implicated among many causes of poor oral health status of prison inmates [10-12]. Oral health is part of general health and periodontal diseases have profound effects on general health and are now considered an integral part of non-communicable diseases (NCD) [13-15]. Despite being preventable, ignorance of caries and periodontal diseases can result in inappropriate oral health practices resulting in tooth ache, discomfort and premature loss of teeth. These can indirectly jeopardize the rehabilitation, reformation and reintegration of prison inmates.

Effective oral health care planning based on comprehensive data for adequate oral health care delivery among inmates in Nigerian Prisons is long overdue. While a study conducted in Southern Nigeria reveals poor oral health status among prison inmates [16], reports on oral health care needs of inmates in Nigerian prisons is yet to be fully investigated. Information on the prevalence of common oral diseases like dental caries, periodontal diseases, tooth fracture and dentine sensitivity among Nigerian prison inmates is scanty. The situation is even worse in Northern Nigeria. The present study was therefore designed to investigate the oral hygiene status, practices and awareness of Medium Security Prison in the Northeastern city of Bauchi. While oral health needs of any community can be investigated by different methods [17-19], in the present study, two methods were adopted namely, through the assessment of Normative Needs and Self Perceived Oral Health Needs. Our investigation was therefore sought to determine the prevalence of oral diseases such as Dental caries, Periodontal diseases, tooth trauma, and dentine sensitivity using the modified WHO proforma 2013 model in addition to relevant questionnaires.

Our findings will contribute to the body of scientific knowledge and complement reports of other studies conducted among prison inmates worldwide. Data generated from this study will serve as a source of scientific information that may assist the relevant authorities in planning for sustainable oral health care delivery to prison inmates especially in Northern Nigeria. To achieve this, we assessed oral hygiene practices among prison inmates, the prevalence of dental caries, periodontal diseases, tooth trauma as well as dentine sensitivity. We also evaluated perceived oral health needs and self-awareness of common oral diseases among the inmates.

Materials and Methods

Study design

This was a cross sectional survey of inmates of Medium Security Prison located in the city of Bauchi, Bauchi state, Nigeria. Simple random sampling technique was adopted in the choice of this prison among six major prisons in the Northeastern geopolitical zone of Nigeria. This prison accommodates both the convicted and awaiting trial inmates with a capacity for 500 persons. Ethical clearance was obtained from the Ethical Review Committee of the Bauchi State Ministry of Health while the Authority of Nigerian Prison Service gave permission for this study. All inmates that had stayed for at least six months in this prison and were willing to participate in the study were recruited. Care was taken to ensure that consent was fully voluntary and that the prisoners were not under any form of coercion to participate in the study. All inmates who had spent less than six months in the prison and those who were not willing to participate in the study were excluded.

A sample size of 196 was calculated for the purpose of this study adopting the following formula: $n = (Z \div E)^2 P (1 - P)$ [20]. n = Sample Size, Z = Desired confidence level (at 95% = 1.96), E = Maximum tolerable sample error (0.05), P = Prevalence (0.15). According to a study conducted in Port Harcourt, Rivers State, South-South Nigeria, caries prevalence (P) of 15.4% (0.15) was detected among adults Nigerians [21]. The subjects were recruited using simple random sampling technique by balloting. All participants were made to sign informed consent.

Data collection

Data was collected through a structured interviewer administered questionnaire and simple clinical oral examinations/recording of clinical findings adopting modified WHO 2013 version of oral health assessment proforma. The questionnaire was structured, coded, closed ended and pretested. It consisted of three parts to record biodata, elicit oral hygiene practices among the subjects and to evaluate

awareness of common oral diseases and perceived oral health care needs among the subjects. The lead researcher administered the questionnaires to all willing participants who met our inclusion criteria within the available space in the prison. He was assisted by three community health workers for recording of data. Questionnaires were well explained and an interpreted version into local Hausa language was made available.

Simple clinical oral examinations were conducted under natural light without lightning aid and in a well-ventilated hall within the prison to determine the oral health status and to diagnose oral conditions among the participants. Each subject was examined sitting on a chair with a back rest, while each examiner stood in front of the subject and a recorder sat beside with a recording table. Three Dentists with broad knowledge in oral diagnosis examined the participants at an average of 35 participants per day and appropriate recordings were done by two trained dental therapists and a community health worker. Inter examiner calibration was earlier conducted among the examiners before the study at Inter country Centre for Oral Research, Jos and was found to be 88% ($\kappa = 0.85$). Standardization of the recording clerks was also done. All data were treated with full confidentiality, coded and safely kept and analyzed with a computer system. Data analyses was done using SPSS statistical software version 16.0 to validate and analyze entries. The initial analysis consisted of generation of frequency tables and statistical relationship between variables using chi-square test were explored with p value of < 0.05 accepted as significant.

Results

A total number of 290 inmates were recruited but 280 subjects which was above the calculated sample size of 196 fully participated in the study. Ten inmates could not complete the study due to issues of discharge during the study and were counted as drop outs. Demographic data showed that 276 male inmates representing 98.6% and 4 female inmates representing 1.4% participated in the study. Gender participation was a reflection of the population of each sex on admission in this prison. Participant's according to age range were, 42 (15.0%) 20 year and below, 135 (48.2%) were 21 - 30 year, 59 (21.1%) were 31 - 40 year and 21 (7.5%) were above 40 year while 23 (8.2%) could not account for their age. Duration of admission of participants in the prison shows that 19 (6.8%) have been in prison for six months, 104 (37.1%) for 7 - 11 months, 70 (25.0%) for 1 - 2 years and 87 (31.1%) for more than 2 years. Educational experience among the subjects shows 163 (58.2%) had no formal education, 36 (12.9%) had primary education, 65 (23.2%) attained secondary level and 16 (5.7%) possessed tertiary educational qualification.

Table 1 shows a large proportion of the participants representing 101 (36.1%) used water and fingers only for tooth cleaning while those who used chewing sticks and toothpaste/toothbrush represented 76 (27.1%) and 76 (27.1%) respectively. This table also shows that a large proportion among those that have stayed for a maximum of 6months in this prison before the study representing 10 (52.6%) uses water and finger for cleaning their teeth daily, 5 (26.3%) uses chewing stick while a smaller proportion representing 4 (21.1%) were found to be using tooth paste and tooth brush for cleaning their teeth. Among the subjects that have stayed for between 7 - 11 months, it was discovered that a larger proportion representing 52 (50.0%) uses water and fingers for daily teeth cleaning, 29 (27.9%) were using tooth paste and tooth brush while 19 (18.3%) and 4 (3.8%) were using chewing stick and tooth brush alone respectively. The materials use for teeth cleaning among subjects that have stayed in the prison for 1 - 2 years shows that 24 (34.3%) uses tooth paste and brush, 23 (32.9%) water and fingers, 22 (31.4%) chewing stick and 1 (1.4%) uses tooth brush without paste, while among those that have stayed above 2years shows 30 (34.5%) uses chewing stick, 22 (25.3%) were non-specific, 19 (21.8%) uses tooth paste and brush, 16 (18.4%) were using water and fingers for cleaning their teeth.

Material used for cleaning teeth	Duration in prison				Total
	6 months	7 - 11 month	1 - 2 years	> 2 years	
Fluoride containing tooth paste and brush	4 (21.1)	29 (27.9)	24 (34.3)	19 (21.8)	76 (27.1)
Chewing stick	5 (26.3)	19 (18.3)	22 (31.4)	30 (34.5)	76 (27.1)
Tooth brush alone	0 (0.0)	4 (3.8)	1 (1.4)	0 (0.0)	5 (1.8)
Water/finger	10 (52.6)	52 (50.0)	23 (32.9)	16 (18.4)	101 (36.1)
Non-specific	0 (0.0)	0 (0.0)	0 (0.0)	22 (25.3)	22 (7.9)

Table 1: Association between teeth cleaning materials used and duration of stay in prison.

$$\chi^2 = 75.719; P = 0.001.$$

Table 2 shows oral hygiene practices and educational levels among the participants. Among the participants with Informal Education, 77 (47.2%) clean their teeth more than 3 times a day and 2 (1.2%) clean their teeth once a week, many of them representing 83 (50.0%) do this during prayers and a greater number of them 63 (39.9%) uses water and finger. Among participants that had tertiary Western Educational level, majority representing 12 (75.0%) uses tooth paste and brush for cleaning their teeth, 13 (81.3%), 2 - 3 times a day and 12 (75.5%) of them do this before breakfast and night. No one among the educated participants clean their teeth once a week. The difference in oral hygiene practices with level of education is statistically significant, P = 0.001.

Variables	Informal	Primary	Secondary	Tertiary	χ^2	P
How often do you clean your teeth?						
Once a day	17 (10.4)	5 (13.9)	13 (20.0)	2 (12.5)	44.673	0.001
2 - 3 times a day	43 (26.4)	18 (50.0)	33 (50.8)	13 (81.3)		
> 3 times a day	77 (47.2)	12 (33.3)	18 (27.7)	1 (6.3)		
Once per week	2 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)		
When do you clean your teeth?						
Non-specific	22 (13.5)	0 (0.0)	0 (0.0)	0 (0.0)	61.580	0.001
Before breakfast	17 (10.4)	6 (16.7)	13 (20.0)	3 (18.8)		
After each meal	12 (7.4)	2 (5.6)	9 (13.8)	0 (0.0)		
Before breakfast and at night	29 (17.8)	10 (27.8)	28 (43.1)	12 (75.0)		
During prayers	83 (50.0)	18 (50.0)	15 (23.1)	1 (6.3)		
What do you use for cleaning your teeth?						
Non-specific	22 (13.5)	0 (0.0)	0 (0.0)	0 (0.0)	48.595	0.001
Fluoride containing tooth paste and brush	29 (17.8)	9 (25.0)	26 (40.0)	12 (75.0)		
Chewing stick	45 (27.6)	13 (36.1)	15 (23.1)	3 (18.8)		
Tooth brush alone	2 (1.2)	2 (5.6)	1 (1.5)	0 (0.0)		
Water/finger	65 (39.9)	12 (33.3)	23 (35.4)	1 (6.3)		

Table 2: Association between education qualification and oral hygiene practices.

Table 3 shows relationship between demographic variables and dental caries among participants. Although no significant statistical difference was recorded in caries experience and age, duration of staying in the prison and educational level among the participants, many participants age 31 - 40 years representing 40 (67.8%) had caries while caries was less recorded among participants less than 20 years of all age groups. On duration of stay in the prison, more of those that have stayed in the prison for 6 months representing 15 (78.9%) had caries compared to those that have stayed for more than 6 months. Many of the subjects free of caries representing 41 (47.1%) were among those that have stayed for more than 2 years. Many among participants with no formal education representing 109 (66.9%) had caries while many participants that have tertiary educational qualifications representing 11 (68.8%) were free of caries.

Demographic Variables	Dental caries		χ^2	P
	No	Yes		
≤ 20	18 (42.9)	24 (57.1)	1.357	0.716
21 - 30	51 (37.8)	84 (62.2)		
31 - 40	19 (32.2)	40 (67.8)		
> 40	7 (33.3)	14 (66.7)		
Duration of admission				
6 months	4 (21.1)	15 (78.9)	6.059	0.109
7 months - 11 months	36 (34.6)	68 (65.4)		
1 - 2 years	25 (35.7)	45 (65.3)		
> 2 years	41 (47.1)	46 (52.9)		
Educational level				
Non-formal	54 (33.1)	109 (66.9)	8.389	0.039
Primary	15 (41.7)	21 (58.3)		
Secondary	26 (40.0)	39 (60.0)		
Tertiary	11 (68.8)	5 (31.3)		

Table 3: Association between demographic variable and dental caries.

Table 4 shows dental caries experience among the subjects.

Variables	Frequency (n = 280)	Percentage (%)	P
Dental caries			
No	106	37.9	0.001
Yes	174	62.1	
Missing teeth due to caries			
None	217	77.5	0.001
One	28	10.0	
Two	15	5.4	
Three	9	3.2	
> Three	11	4.0	
Missing teeth due to other reasons			
None	269	96.1	0.001
One	4	1.4	
Two	3	1.1	
Three	-	-	
> Three	4	1.5	
Filled no decay			
None	274	97.9	0.001
One	3	1.1	
Two	2	0.7	
Three	1	0.4	
Filled with decay			
None	278	99.0	0.001
One	2	0.7	

Table 4: Distribution of study participants according to DMFT analysis.

While 106 (37.9%) of the participants were free of dental caries on examination, 174 (62.1%) were detected to be having dental caries and this represent the caries prevalence among the study population. The mean DMFT was 2.94 ± 0.34 . Missing teeth aspect of DMFT (due to caries) shows 217 (77.5%) did not have missing teeth, 28 (10.0%) had only one missing tooth due to caries, 15 (5.4%) two missing teeth, 9 (3.2%) three missing teeth and 6 (2.2%) had more than three missing teeth due to caries. It was also discovered that 5 (1.8%) of the study population had missing teeth due to other reasons.

Filled component shows 274 (97.9%) of the subject had no filled teeth while 3 (1.1%) of the subjects had one teeth each filled due to dental caries, 2 (0.7%) had two teeth each filled and 1 (0.4%) had three teeth filled. Among the participants, 2 (0.7%) had one tooth each with recurrent caries (new caries).

Table 5 Shows association between oral hygiene practices and dental caries among the study population. On the regularity of daily tooth cleaning, those that clean their teeth more than 3 times a day representing 73 (67.6%) had more caries than other groups, this is followed by those that clean once a day representing 24 (64.9%), those that clean 2 - 3 times a day representing 61 (57.0%), those that

rarely clean their teeth once in a day 15 (57.7%) and those that clean their teeth once a week 1 (50.0%). Dental caries was detected more among those that clean their teeth only during prayers than among any other group. On the material for teeth cleaning, many among those that use water and fingers alone representing 65 (64.4%) had caries than any other group.

Practices	Caries		χ ²	P
	No	Yes		
How often do you clean your teeth?				
Once a day	13 (35.1)	24 (64.9)	3.023	0.554
2 - 3 times a day	46 (43.0)	61 (57.0)		
> 3 times a day	35 (32.4)	73 (67.6)		
Once per week	1 (50.0)	1 (50.0)		
Rarely	11 (42.3)	15 (57.7)		
When do you clean your teeth?				
Before breakfast	13 (33.3)	26 (66.7)	4.568	0.335
After each meal	9 (39.1)	14 (60.9)		
Before breakfast and at night	35 (44.3)	44 (55.7)		
During prayers	38 (32.5)	79 (67.5)		
Non-specific	11 (50.0)	11 (50.0)		
What do you use for cleaning your teeth?				
Fluoride containing tooth paste and brush	28 (36.8)	48 (63.2)	2.698	0.610
Chewing stick	28 (36.8)	48 (63.2)		
Tooth brush alone	3 (60.0)	2 (40.0)		
Water/finger	36 (35.6)	65 (64.4)		
Non-specific	11 (50.0)	11 (50.0)		

Table 5: Association between oral hygiene practices and dental caries among study participants.

Figure 1 shows the distribution of the participants according to periodontal index. Approximately 23% of the subjects were noticed to have healthy periodontium while 77% had periodontal challenges. The prevalence of periodontal disease among the study participants was therefore put at 77%. It was discovered that 15 (5.4%) had bleeding gum, 112 (40.0%) had calculus, 68 (24.3%) had periodontal pocket of between 4 - 5 mm, 22 (7.9%) had periodontal pocket of 6 mm or more.

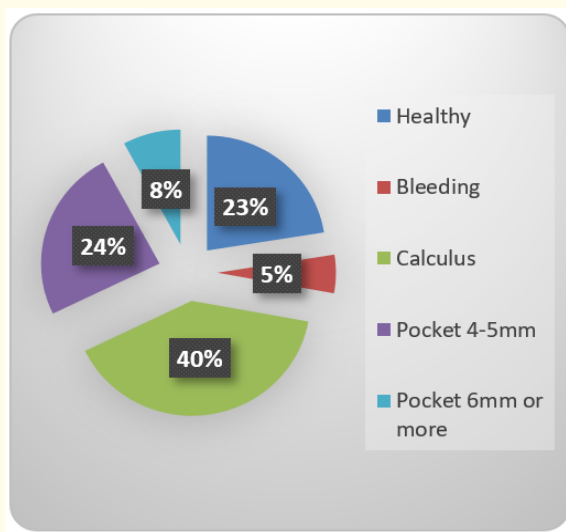


Figure 1: Distribution of study participants according to community periodontal index.

P-value = 0.001.

Table 6 depict demographic variable and community periodontal index. Majority of the participants observed to be having healthy periodontal status belong to age group 21 - 30 years and age 31 - 40 representing 30 (22.2%) and 13 (22.0%) respectively while many participants with poor periodontal health demonstrated by increased periodontal pockets of 4 mm and above were of age 40 and above. Non among the participant less than 20 years representing 0 (0.0%) presented with periodontal pocket of 6 mm and above. This is statistically significant with $p = 0.0009$. There was no statistical significance difference observed in periodontal health of the participants in relation to duration of stay in the prison. Healthy periodontal status was observed among many participants exposed to formal education representing 10 (27.8%) with primary, 18 (27.7%) secondary and 6 (37.5%) tertiary while healthy periodontal health was less observed among participants that were not exposed to Western Education representing 12 (17.1%). Although majority of the participants presented with poor periodontal health, a greater proportion of those with periodontal challenges were among the subjects that were not exposed to Western Education, while 45 (27.6%) and 12 (7.4%) among the subjects with informal education had periodontal pocket of 4 - 5 mm and 6 mm respectively. Among the participants that had tertiary education qualification, 0 (0.0%) and 1 (6.3%) had 4 - 5 mm and 6 mm periodontal pocket respectively, $P = 0.001$.

Demographic Variables	Community Periodontal Index					χ^2	P
	Healthy	Bleeding	Calculus	Pocket 4 - 5 mm	Pocket 6 mm more		
≤ 20	7 (16.7)	3 (7.1)	27 (64.3)	5 (11.9)	0 (0.0)	26.690	0.0009
21 - 30	30 (22.2)	10 (7.4)	52 (38.5)	32 (23.7)	11 (8.1)		
1 - 40	13 (22.0)	1 (1.7)	18 (30.5)	20 (33.9)	7 (11.9)		
> 40	4 (19.0)	0 (0.0)	5 (23.8)	8 (38.1)	4 (19.0)		
Duration of admission							
< 6 months	3 (15.8)	0 (0.0)	7 (36.8)	8 (42.1)	1 (5.3)	11.479	0.488
6 months - 1 years	24 (23.1)	8 (7.7)	42 (40.4)	19 (18.3)	11 (10.6)		
1 - 2 years	12 (17.1)	4 (5.7)	30 (42.9)	20 (28.6)	4 (5.7)		
> 2 years	24 (27.6)	3 (3.4)	33 (37.9)	21 (24.1)	6 (6.9)		
Educational level							
Non-formal	29 (17.8)	3 (1.8)	74 (54.4)	45 (27.6)	12 (7.4)	37.729	0.001
Primary	10 (27.8)	0 (0.0)	11 (30.6)	10 (27.8)	5 (13.9)		
Secondary	18 (27.7)	8 (12.3)	22 (33.8)	13 (20.0)	4 (6.2)		
Tertiary	6 (37.5)	4 (25.0)	5 (31.3)	0 (0.0)	1 (6.3)		

Table 6: Association between demographic variable and community periodontal index.

Figure 2 shows the distribution of the participants according to the types of dental trauma. While a large proportion of the subjects representing 225 (80.4%) had no evidence of trauma to any tooth, 55 (18.6%) presented with different features of tooth fracture. Among those with tooth fracture, a large proportion representing 21 (37.0%) had enamel fracture while those having crown fracture with pulp involvement constitute the least percentage of 3 (5.6%).

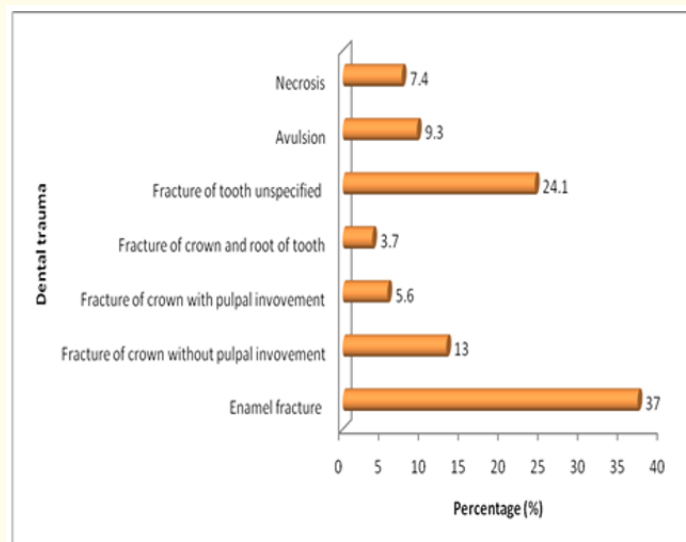


Figure 2: Distribution of study participants according to type of dental trauma.

P -value = 0.001.

In this study, majority of the participants representing 161 (57.7%) were experiencing dentinal sensitivity as against 119 (42.5%) that were free of dentinal sensitivity.

Table 7 shows the distribution of the participants according to awareness of common oral diseases and self-perceived oral health needs. Among the study participants, 219 (78.2%) stated that they have dental problems which require treatments, while 39 (13.9%) indicated absence of dental problem hence no need for any dental treatment and 22 (7.9%) do not know if they have dental problem or not. Among the subjects that were aware of having one dental problem or the other, majority of them representing 110 (50.2%) indicated tooth decay as their major problem, 61 (27.9%) indicated tooth ache, 24 (11.0%) indicated gum bleeding, 9 (4.1%) tooth mobility, 4 (1.8%) each for tooth trauma and intrinsic stains, 3 (1.4%) mouth odor, 2 (0.9%) abnormal growth and 1 (0.5%) each for mouth ulcer and extrinsic stains.

Variables	Frequency (n = 280)	Percentage (%)	P
Presently, do you have any dental problem?			
Yes	219	78.2	0.001
No	39	13.9	
Don't know	22	7.9	
If you have dental problem, do you think you need treatment?			
Yes	219	100.0	-
No	-	-	
What type of dental problem(s) do you have that needs treatment			
Tooth decay	110	50.2	0.001
Tooth/jaw fracture	4	1.8	
Gum bleeding	24	11.0	
Tooth ache	61	27.9	
Mouth odor	3	1.4	
Tooth mobility	9	4.1	
Mouth ulcer	1	0.5	
Abnormal growth	2	0.9	
Tooth stains extrinsic (plaque and calculus)	1	0.5	
Tooth stains-intrinsic	4	1.8	

Table 7: Distribution of study participants according to perceived dental problem and treatment needs.

Discussion

In this study the results from clinical oral examinations and our findings from responses of inmates to relevant questionnaires shows high normative and perceived dental treatment needs among the study population. In this study, result shows many subjects were aware of the common oral diseases, high self- perception of oral health need and also high prevalence of dental caries and periodontal diseases which reflect the normative oral health needs. The high prevalence of common oral diseases especially dental caries and periodontal diseases among the inmates conform to previous related studies in other parts of the world [16,22,23]. The factors responsible for this as observed in our study may be attributed to lack of oral hygiene awareness that resulted in poor oral hygiene practices, relatively lack and usage of ideal tooth cleaning materials and poor attention the inmates pays to their oral hygiene practices. There is a strong contradiction

between the frequencies of daily teeth cleaning and presence of oral diseases among the participants. Majority of the inmates depend on water and finger alone for cleaning their teeth and like in previous studies, this was not of any significant help in the prevention of diseases like dental caries and periodontal diseases [24,25], the reason for lack and usage of the ideal oral cleaning material is beyond this study. Poor oral hygiene awareness among the study population in this study may be due to poor educational status of majority of the participants and paucity of oral health care givers in the prison that may help in educating them. Lack of oral health care givers at the study center might have accounted for noticeable poor dental care among them. The relative poor dental care among the inmates was revealed by our findings from the analysis of DMFT. The result shows higher decayed and missing components while the filling components which is an evidence of poor restorative index was low and this study mirrors the result from previous similar studies [16]. While higher caries prevalence was observed more among the age groups less than 40 years in this study although not so significant statistically, poor periodontal health in term of increased periodontal pocket and attachment loss was detected more among the older age groups. Poor periodontal health observed in this study among the subjects is closely linked with poor oral hygiene practices and this may be the responsible for higher prevalence of the periodontal diseases among the study population.

The result of trauma to teeth among the inmates in this study shows majority of the participants free of dental trauma. Among those that were recorded to have sustained trauma to their teeth, majority had fracture of enamel. It was also observed that many of the traumatic teeth among the inmates were not treated/restored. Trauma to teeth if not treated may result in dentinal sensitivity. In response to the question on dentinal sensitivity, a larger percentage of the respondents indicated that they suffers dentinal sensitivity. Apart from trauma to teeth, other conditions such as tooth substance loss like attrition, abrasion and erosion may lead to dentinal exposure and sensitivities. The factors responsible for many inmates affected by dentinal sensitivity can further be investigated.

Conclusion

By assessments of dental health status of the inmates in this study, we observed higher prevalence of Dental Caries, Periodontal Diseases and Tooth Sensitivity while a lesser percentage presented with tooth trauma. This is an indication for high normative oral health need among the inmates in this prison. Higher level of awareness of common oral diseases among those affected was observed and self-perception of oral health needs was equally high. Both the primary and secondary preventive measures against common oral diseases among the study population was noticed to be poor. Oral hygiene practices with regard to techniques, materials in use and timing was observed to be a departure from ideal. Oral health care among the inmates was not optimal. Poor oral health status of the inmates may affect them physically and psychologically and their rehabilitation, reformation and reintegration back to the society may be compromised.

Recommendations

Prison service and other relevant authorities should make available ideal materials for the inmates to clean their teeth regularly. The authorities concern should pay more attention to the inmates' oral health by making sure that they have unrestricted access to qualitative dental care with emphasis on oral health care facilities and personnel. Prison inmates will also have their oral health improved by way of increase oral hygiene awareness through education.

Conflict of Interest

The authors joint and several responsibility for this submission and declare no conflict of interest.

Bibliography

1. Hornby AS. "Oxford Advanced Learner's Dictionary of Current English". Oxford University Press, Great Clarendon Street, Oxford, ox2 6DP, United Kingdom 9 (2015): 1221.
2. Akpe AF. "Visions and Missions of Nigeria Prison service Hand Book" (2004).

3. United Nation Publication. Human Right and Prisons: A Pocketbook of International Human Rights Standards for Prison Officials. United Nations, New York and Geneva (2005).
4. Amnesty International. Amnesty international press release, AI index: AFR 44/019/2007 (Public) News service No. 157 (2007).
5. Amy LK. "African American Men's Health and Incarceration: Access to care upon Re-entry and Eliminating Invisible Punishments". *Berkeley Journal of Gender, Law and Justice* 26.2 (2011): 221-252.
6. Audu O., et al. "Five year Review of disease profile of inmates in three prison formation, in Kaduna state, Nigeria. A case control study". *Nigeria Hospital Practice* 13.5-6 (2014): 65-71.
7. World health organization (WHO). Regional office of Europe, Edited by: Lars Moller, Heino Stover (2007) Health in prisons: A WHO guide to the essential, in prison health (2007).
8. Reddy V., et al. "A Survey on oral health status and treatment need of life-imprisoned inmates in central Jails of Karnataka, India". *International Dental Journal* 62.1 (2012): 27-32.
9. Nobil CG., et al. "Oral Health status of male prisoners in Italy". *International Dental Journal* 57.1 (2007): 27-35.
10. Digra R., et al. "Oral health knowledge, attitude and practices (KAP) among prison inmates of Ambala District Haryana (India)". *Dental, Oral and Craniofacial Research* 1 (2015).
11. Andrea BEL and Linsay MP. "Oral Health needs of Canadian prisoners as described by formerly incarcerated New Brunswicker". *Canadian Journal of Dental Hygiene* 46.3 (2012): 173-180.
12. Rouxel P., et al. "Oral Health of Female Prisoners in HMP Holloway Implication for oral health promotion in UK prisons". *British Dental Journal* 214.12 (2014): 627-632.
13. William RC., et al. "The potential impact of periodontal disease on general health: a Consensus view". *Current Medical Research and Opinion* 24.6 (2008): 1635-1643.
14. Mani Ameet M., et al. "The relationship between periodontitis and systemic disease". *Journal of Clinical and Diagnostic Research* 7.4 (2013): 758-762.
15. Daves S., et al. "The link between periodontal diseases and Atherosclerosis". *Compendium of Continuing Education in Dentistry* 25.7 (2004): 26-37.
16. Akaji E and Ashiwaju M. "Oral Health status of a sample of prisoners in Enugu: a disadvantaged population". *Annals of Medical and Health Science Research* 4.4 (2014): 650-653.
17. Jeboda SO. "Perceptive needs and oral health education". *Nigerian Quarterly Journal of Hospital Medicine* (1998).
18. Osberg AL., et al. "Epidemiological dental indices and self-perceived oral health in adolescents ecological aspects". *Acta Odontologica Scandinavica* 61.1 (2003): 19-23.
19. Pankaj G., et al. "Oral health care for elderly. Identifying the needs and possible strategy for service provision". *Indian Journal of Dental Research* 17.1 (2006): 11-21.
20. Machin D and Cambell MJ. "Comparing two means in Statistical Table for the Design of Clinical Studies". Oxford: Blackwell Scientific Publications (1978): 79-88.

21. Braimoh OB., *et al.* "Caries Distribution, Prevalence and Treatment Needs among 12-15 year old Nigerian Secondary School Students in Port Harcourt Rivers State, Nigeria". *Journal of Dental Surgery* (2014): 483760.
22. Navdoos S., *et al.* "A baseline survey oral health of prisoners- Wes Cape". *South African Dental Journal* 60.1 (2005): 24-27.
23. Dayalear MM., *et al.* "Assessment of periodontal health status among prison inmates: A cross-sectional survey". *Journal of Indian Society of Periodontology* 18.1 (2014): 74-77.
24. Idowu EA., *et al.* "Oral Health Knowledge and Practices of 12-14 year Almajiris in Nigeria A problem of definition and a call to action". *Journal of Public Health Policy* 37.2 (2016): 1-18.
25. Idowu EA., *et al.* "Dental caries experience and restorative need among 12-14-year-old Almajiris and private school children in Kano City". *Tropical Dental Journal* 40.160 (2017): 15-24.

Volume 18 Issue 3 March 2019

©All rights reserved by Solomon Olusegun Nwhator., *et al.*