

Assessment of Oral Health Status Among Prisoners in Central Jail of Hyderabad City India: A Cross Sectional Study

Jithender Nagilla^{1*} Rakesh Reddy Chukka² Rahul Lingala³ Naresh Kumar K⁴ Narender Reddy M⁵
Gayatri TVL⁶

¹Senior Lecturer, Department of Public Health Dentistry, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

²Senior Lecturer, Department of Conservative Dentistry and Endodontics, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

³Senior Lecturer, Department of Conservative Dentistry and Endodontics, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

⁴Senior Lecturer, Department of Conservative Dentistry and Endodontics, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

⁵Reader, Department of Conservative Dentistry and Endodontics, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

⁶PG Student, Department of Conservative Dentistry and Endodontics, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

ABSTRACT

Background: Prisoners make a special group of population as they are different from other people in context of their “freedom of movement”.

Materials and Method: WHO oral health status profoma and questionnaire for adults (2013) was used to assess oral health status. Chi square test and analysis of variance (ANOVA) was used for comparison among the variables.

Results: Majority of prisoners (83.4%) had dental caries with mean caries experience of 4.12 ± 2.57 . Around 83% of prisoners had bleeding gums, 73.1/% had periodontal pockets and 39.5% had loss of attachment (LOA). Most common oro-mucosal lesions observed were oral submucous fibrosis. Enamel fluorosis was observed in 47.7% of subjects, 22.2% had dental erosions and 62.5% had traumatic dental injuries. Majority needed immediate treatment due to pain or infection (47.8%) followed by prompt treatment including scaling (46%).

Conclusion: The inmates of Hyderabad central jail had high prevalence of dental diseases. Furthermore, the need for dental treatment was also higher.

Keywords: Prisoners, Dental caries, Loss of Attachment, Enamel fluorosis.

INTRODUCTION

Health is a fundamental right of every individual and oral health is an integral part of general health.¹ Various factors, such as socioeconomic status, occupation, and education play major role in the maintenance of good oral health.² Various studies have been conducted on general population's (children, adults, adolescents etc.) oral health conditions³⁻⁴. Physically and mentally

handicapped groups were also studied indicating that society is sensitive towards their oral health.⁵ But socially handicapped groups i.e., prisoners were not addressed properly. Prisoners make a special group of population as they are different from other people in context of their “freedom of movement”.⁶ Prisoners are vulnerable to a wide range of health problems, most commonly alcohol, drug abuse, smoking, chronic diseases, mental illness,

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*Correspondence Dr. Jithender Nagilla.

Department of Public Health Dentistry, SVS Institute of Dental Sciences, KNR University of Health Sciences, Telangana, India.

Email: Not Disclosed

psychosocial and psychiatric problems as well as oral health.⁷ Studies have revealed that prisoners had significantly more decayed and missing teeth and fewer restorations than the general population.⁸ A high prevalence of periodontal

disease has been recorded among prisoners,⁶ as large number of prisoners smoke, misuse substances and exhibit stress-induced parafunctional habits.⁹

Table 1: Mean number of permanent teeth with caries experience (DMFT), decayed permanent teeth (DT), filled permanent teeth (FT) and missing permanent teeth (MT) and root caries.

Variable	Mean ± SD Coronal				Mean ± SD Root caries
	DMFT	DT	MT	FT	
Age groups					
18-37yrs	4.062.44	3.652.40	0.170.53	0.250.77	0.140.82
38-57yrs	4.402.91	3.432.58	0.5 1.45	0.4 1.05	0.230.74
58-77yrs	3.332.80	3.262.70	0.070.38	0.000.00	0.851.63
Total	4.122.57	3.592.45	0.250.85	0.290.84	0.180.84
p-value	0.0639	0.3940	0.0001*	0.0012*	0.0001*
Duration					
<3yrs	4.1 2.53	3.682.47	0.210.65	0.230.70	0.150.63
3-6yrs	4.012.45	3.342.23	0.200.76	0.461.17	0.271.50
6-10yrs	4.123.31	2.722.35	0.802.29	0.601.21	0.300.81
>10 yrs	5.892.93	4.563.68	0.561.67	0.781.56	0.671.66
p-value	0.2091	0.0170*	0.0001*	0.0001*	0.0882
Total	4.122.57	3.592.45	0.250.85	0.290.84	0.180.84

***p<0.05 statistical significant**

Table 2: Mean number of teeth present with gingival bleeding, pockets and loss of attachment.

Variable	Bleeding	Pockets	Loss of attachment
	Mean SD		
Age groups			
18-37yrs	11.51 7.78	1.87 0.71	0.10 $\pm$ 0.32
38-57yrs	17.54 7.94	2.58 0.59	0.84 $\pm$ 0.58
58-77yrs	16.81 12.52	4.400.76	1.28 $\pm$ 0.51
p-value	0.0001*	0.0001*	0.0001*
Duration			
<3yrs	12.58 8.24	1.990.74	0.27 $\pm$ 0.62
3-6yrs	14.73 8.26	2.27 0.75	0.20 $\pm$ 0.60
6-10yrs	15.72 9.56	4.18 0.80	0.43 $\pm$ 0.51

>10 yrs	13.56 11.29	4.14 0.69	0.18±1.09
Total	13.07 8.39	3.350.75	0.28±0.48
p-value	0.0042*	0.0001*	0.07

***p<0.05 statistical significant**

Table 3: Distribution of prisoners with Dental Erosion, Traumatic Dental Injuries (TDI), Oro Mucosal Lesions and Enamel Fluorosis

Variable	n (%)			
	Dental Erosion	TDI	Oro Mucosal Lesions	Enamel Fluorosis
Age				
18-37yrs	93(9.6)	443(46.1)	110(11.4)	344(35.8)
38-57yrs	110(11.4)	149(15.5)	71(7.3)	91(9.4)
58-77yrs	17(1.7)	20(2.1)	7(0.7)	10(1)
P value	0.0001*	0.0001*	0.0001*	0.0001*
Duration				
<3yrs	147 (15.3)	469(48.8)	147(15.3)	360(37.5)
3-6yrs	42 (4.4)	97(10.1)	27(2.8)	60(6.2)
6-10yrs	26 (2.7)	39(4)	12(1.2)	22(2.2)
>10 yrs	5 (0.5)	7(0.7)	2(0.2)	3(0.3)
Total	220(22.9)	612(63.7)	188(19.5)	445(46.3)
P value	0.0001*	0.0128*	0.0001*	0.0009*

***p<0.05 statistical significance**

An assessment of prisoner's oral health is required along with oral health promotion as they will return to the general population. Also, there is no information about the oral health status of inmate's of Hyderabad central Jail. Considering all these reasons, the present study was carried out to assess the Oral health status among Hyderabad central jail prisoners.

MATERIAL AND METHODS

A cross sectional study was carried out to assess dentition status, periodontal status, oro-mucosal lesions, traumatic dental injuries, dental erosions and dental fluorosis among Hyderabad central jail prisoners by using WHO oral health assessment form,¹⁰ 2013 by a single pre-trained, pre-calibrated examiner to limit intra-examiner variability. Ethical

clearance was obtained from the Institutional Review Board of Panineeya Mahavidyalaya Institute of Dental Sciences and Research Centre (PMVIDS/PHD/0030/2014). The permission to carry out the study was obtained from the Director General of prisons and correctional services, Hyderabad city, Telangana. A pilot study was conducted among prisoners in central jail of Hyderabad to assess the feasibility, to estimate the sample size and to finalize the survey Proforma. At a Standard Deviation of DMFT = 0.602, Absolute Precision (%) of 4 at a confidence level of 99% and sampling error at 1%, the estimated sample size was minimum of 890. Prisoners, who gave consent and who were present on the day of examination were included in the present study. Subjects with any medical condition or on antibiotic therapy were excluded. The study was conducted for a period of

four months from the month of December 2015 to March 2016. Informed consent was obtained from each participant before oral examination. The data was analysed using the Statistical Package for Social Sciences (SPSS) package version 20. Chi square analysis was used to find the significance of two variables proportions. Analysis of Variance (ANOVA) was used for comparison among variables. $p \leq 0.05$ was set as statistically significant.

RESULTS

A total of 960 male prisoners were included in the study and the mean age of study subjects was 38.2 ± 9.2 years. Out of 960 subjects 83.4% had caries experience (DMFT) and the overall mean caries experience was 4.12 ± 2.57 . On consideration of individual component, high percentage of subjects had decayed component (82.1%), followed by missing (18.7%) and filled component (13.1%). The overall mean DMFT (4.06 ± 2.44) and the decayed component (3.65 ± 2.40) was higher among the subjects of 18-37 years and among prisoners with more than 10 years of imprisonment. On a positive note, majority of the prisoners did not had root caries (93.5%) ($p=0.0001^*$). (Table - 1)

A high proportion of prisoners had bleeding gums (83.33%), periodontal pockets (73.1%) and loss of attachment (39.5%) with higher prevalence among subjects of 18-37 years and among prisoners with less than 3 years of imprisonment. The overall mean number of teeth with periodontal disease increased with age and imprisoned for 6-10 years was statistically significant ($p=0.001$). (Table - 2)

On a significant note, only 22.9% of subjects had signs of tooth erosion. The prevalence of traumatic dental injuries was high (62.5%) and the most common type were fracture involving enamel (15.8%), followed by fracture involving enamel and dentine (12.9%), fractures involving pulp (10.1%) and missing tooth due to trauma (8.9%). On a positive note, 80.4% of prisoners had no mucosal lesions and none of the prisoners had malignant tumors. Most common mucosal lesions observed were oral sub mucous fibrosis (9.5%), abscess (5.1%), followed by leukoplakia (1.8%) and candidal lesions (1.8%). A high percentage of subjects (47.7%) had enamel fluorosis. (Table- 3) However a majority of prisoners had habit of smoking (75.6%) and chewing tobacco (51.9%).

Majority of the prisoners required an immediate (urgent) treatment due to pain or infection of dental and/or oral origin (47.8%) followed by Prompt treatment including scaling (46%).

DISCUSSION

In the present study, the decayed component (82.4%, 3.59 ± 2.45) significantly constituted the major part of caries experience (83.4%, 4.12 ± 2.57). Furthermore, though Nobil GA et al¹¹, Naidoo S et al¹² and MC Grath C et al¹³ reported a similar caries prevalence (98%, 93% and 93% respectively) but the mean DMFT was high compared to present study (9.8, 15.4 and 22.5 respectively). However Hiremath VP et al¹⁴ reported mean DMFT of 5.22 which was in accordance with the present study. This is due to the fact that dental caries is a multi-factorial disease, lack of adequate oral hygiene measures and lack of preventive and therapeutic dental services in the jail.

On a positive note, the prevalence of root caries was very low (6.8%) with highest mean number of teeth with root caries seen among prisoners of 58-77 age group (0.85 ± 1.63). With the increasing age, there is an increased gingival recession, leading to exposure of root surface to the oral environment leading to root caries. Similar findings were reported by Nobil GA et al¹¹ (8.1%) among Italian prisoners

Among the study population, 83.3% of the subjects had gingival bleeding, 73.3% had pocket depth of ≥ 4 mm and 39.5% of the subjects had Loss of attachment of more than 4 mm. This high prevalence of periodontal disease may be due to poor oral hygiene practices, adverse oral habits, poor literacy level leading to low awareness and various types of stresses experienced by the inmates. On comparison with the present study, the prevalence of periodontal disease was low in a study by Dhanker K et al¹⁵ [bleeding (1.8%); pockets (6%)] among Mathura District jail prisoners and by Nagarole RG et al¹⁷ (bleeding (13%); pockets (24%)) among Dharwad prisoners. This difference may be due to oral hygiene practices, life style and cultural differences and availability of dental services.

In the present study 22.2 % of prisoners had dental erosions. This could be because of availability of soft drinks at jail and furthermore 52.6% of study

subjects reported the habit of consuming soft drinks. Among the study subjects the prevalence of dental trauma was 62.5%, with most common type were fracture involving enamel (5.8%). This high prevalence may be due to psychological problem and stress level of prisoners leading to rivalries and violence between prisoners. In this study, 47.7% of prisoners had enamel fluorosis which was in contrast with a study done by Anup N et al² (96%) and Dhankar K et al¹⁵ (96%). This could be because of geographical variations. The overall prevalence of oro mucosal lesions was 19.6%, with oral sub mucous fibrosis being most common (9.5%). Similar findings were also observed in a study by Reddy V et al¹⁷ (9.9%) among Karnataka prisoners. To the contrast, Anup et al², Agarwal N et al¹⁸ and Dhanker K et al¹⁶ reported a high prevalence (59.8%, 57.4% and 59.8% respectively) of oromucoasal lesions, where in leukoplakia was most common lesion observed(31.1%, 32.3% and 31.1% respectively). The above findings might be due to higher tendency of smoking (59%) and chewing tobacco (40.8%) among present prisoners to overcome the stress and boredom

Alarmingly in the study More than half of the prisoners smoke cigarettes (75.6%) and chewed tobacco (51.9%) suggesting a higher risk of developing oral diseases and this might be one of the reason for the prevalence of oro mucosal lesions and severe periodontal disease..

In the present study, dental needs of prisoners were relatively high, with 47.8% of subjects requiring immediate treatment, 46% require prompt treatment, 0.7% are in need of preventive treatment. Furthermore, the need for dental treatment was also higher in the studies by Dhanker K et al¹⁵, Anup et al² and Agarwal N et al¹⁸. This highlights the need of dental service in prison.

However, this study acknowledges certain limitations such as cross-sectional study design and the self-reporting nature of the questionnaire. Self-administered questionnaires have limitations in identifying cause and effect relationships and may be subjected to information bias. Also, a sample larger than the estimated sample size, can add to the merit of the study.

CONCLUSION

The inmates of Hyderabad central jail had high prevalence of dental caries, periodontal disease, traumatic dental injuries and varying degrees of oromucosal lesions, dental fluorosis and dental erosion lesions. The need for dental treatment was also higher.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Colsher PL, Wallace RB, Loeffelholz PL et al. Health status of older male prisoners: a comprehensive survey. *Am J Public Health* 1992; 82(6): 881-82.
2. Anup N, BiswasG, VishnaniP, Tambi S, Acharaya S, Kumawat H. Oral Health Status and Treatment Needs Of Inmates in District Jail of Jaipur City – A Cross Sectional Study. *Journal of Nursing and Health Science* 2014;3: 322-31.
3. Haridas R, S S, Ajagannanavar SL, Tikare S, Maliyil MJ, Kalappa AA Oral Health Literacy and Oral Health Status among Adults Attending Dental College Hospital in India. *J Int_Oral Health* 2014 Nov-Dec; 6(6):61-6
4. Purohit B, Singh A. Oral health status of 12-year-old children with and controls in Southern India. *WHO South-East Asia J of Public Health* 2012;1(3):330-338
5. Kaur S, Malhotra R, Malhotra R, Kaur H, Battu VS, Kaur A. Oral hygiene status of mentally and physically challenged individuals living in a specialized institution in Mohali, India. *Indian j Oral Sci* 2103; 4: 17-22.
6. Heidari E, Dickinson C, Wilson R and Fiske J. Oral health of remand prisoners in HMP Brixton, London. *Br Dent J* 2007; 14(7): 368-9.
7. Heng CK, Douglas EM. Dental caries experience of female inmates. *J Public Health Dent* 2002; 62: 57-61.
8. Cunningham M, Glenn RE, Field HM, Jakobsen JR. Dental disease prevalence in a prison

- population. J Public Health Dent 1985; 45:49-52
9. JoRuth Gray, Sue Gregory. Dental health in prisons.99-103
 10. World Health Organization. Oral health surveys basic methods. 5. Geneva: World Health Organization; 2013.
 11. Nobil CG, Fortunato L, Pavia M. Oral health status of male prisoners in Italy. Int Dent J 2007; 57: 27-35.
 12. Naidoo S, Yengopal V, Cohen B. Abaseline survey: oral health status of prisoners – Western Cape. J Dent Assoc S Afr 2005;60(1):24-27.
 13. McGrath C. Oral health behind bars: A study of oral disease and its impact on the life quality of an older prison population. Gerodontology 2002; 19: 109-114.
 14. Hiremath VP. Oral Health Status and Treatment Needs of the inmates in Hindalga Central Prison, Belgavi-Karnataka. J Indian Assoc Public Health Dent 2009; 14: 1-6.
 15. Dhanker K, Ingle NA, Kaur N, Gupta R. Oral Health Status and Treatment Needs of Inmates in District Jail of Mathura City – A Cross Sectional Study. J Oral Health Comm Dent 2013; 7; 24-32.
 16. Nagarale RG, Nagarale G, Shetty PJ, Prasad KVV. Oral health status and treatment needs of prisoners of Dharwad. India. Int J Dent Health Sci 2014; 1(6):849-860.
 17. Reddy V, Kondareddy C, Siddanna S, Manjunath M. A survey on oral health status and treatment needs of life imprisoned inmates in central jails of Karnataka, India. Int Dent J 2012; 62: 27-32.
 18. Agrawal N, Gupta N D, Kuma A, Tiwari R K, Bey A A survey on oral health status and treatment needs of prison inmates of Aligarh district in Uttar Pradesh, India. <http://www.ejournalofdentistry.com/mobile/14-3.html>.