

Comparison of Periodontal Health Status among Urban and Rural Adult Population in Jamshedpur City: A Cross-Sectional Study

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ABSTRACT

Aim: Periodontal disease are one of the major causes of tooth loss in India. Urbanization has been viewed as strong determinants for a variety of different health outcome. Epidemiological studies assessing the periodontal status of school children have been conducted in Jamshedpur. There was a constant need to evaluate periodontal status of adults and analyse the comparison between urban and rural population.

Material and methods: A population study of age group 20-49 years of rural Jamshedpur was conducted from January 2018 to march 2018. Estimated sample size of 550 subjects was calculated. Periodontal health was assessed using CPITN probe. The data was analysed using SPSS software. Chi square test was used to test the level of significance with statistical significance 0.05.

Results: The no of subjects in 20-29 age group in urban population was 127 (55.46%) and in rural population was 184 (60.53%). In 30-39 year age group urban population was 78 (34.06%) and in rural 67 (22.04%). As compared to rural population, urban population has significantly higher population of subjects with max CPI score of lower order. significantly higher proportion of urban subjects had max LOA score 0 as compared to rural subjects (0.001)

Conclusion: Rural populations were suffering from periodontal disease as compared to urban. so to improve the periodontal health status of rural population it is suggested that a community based approach can be designed with an initial curative care followed by long term preventive care.

Keywords: Periodontal health, urban, rural, school children.

INTRODUCTION

Periodontal diseases are one of the major causes of tooth loss in India. These include pathological conditions of the supporting structures of the teeth, i.e. gingiva, alveolar bone, periodontal ligament and cementum. Gingival and periodontal diseases affect 90% of the population.¹ Prevalence of periodontal disease depends on variables like age, sex, race, ethnicity, education, geographic and environmental status, oral hygiene habits, living patterns, social characteristics and dental awareness.²

The most important resource of India is its more than 100 million populations. India is predominantly rural, as around 70% of people continue to live in rural areas. Nearly 30% of population lives in urban areas.³ Urbanization has been viewed as strong determinant for a variety of different health outcomes. Rural areas have often been associated with poverty and access issues, both of which can have a profound impact on wellness. There are urban-rural differences in the average level of education, in the kind of work people do, in incomes, and in associated aspects of \

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Table 1: Distribution of subjects according to age, gender and Socioeconomic Status.

	RURAL		URBAN		chi square value	P value
	No.	%	No.	%		
Age Group (Years)						
20-29	184	60.53	127	55.46	28.05	0.57
30-39	67	22.04	78	34.06		
40-49	53	17.43	23	10.04		
Gender						
Male	165	54.28	117	51.09	1.78	0.317
Female	139	45.72	112	48.91		
Socioeconomic Status						
Very poor	15	4.93	7	3.06	39.43	0.001*
Poor	99	32.57	18	7.86		
Lower Middle	104	34.21	56	24.45		
Upper Middle	86	28.29	68	29.69		
High	0	0.00	49	21.40		
Very High	0	0.00	31	13.54		

Table 2: Distribution of subjects according to dental hygiene practices.

Practice	RURAL		URBAN		Chi square	p value
	No.	%	No.	%		
Material used for teeth cleaning						
Toothpaste	89	29.28	189	82.53	76.67	<0.001*
Powder	170	55.92	32	13.97		
Others	28	9.21	6	2.62		
None	17	5.59	2	0.87		
Method of cleaning						
Toothbrush	201	66.12	78	34.06	72.9	<0.001*
Finger	87	28.62	102	44.54		
Tree stick	15	4.93	45	19.65		
None	1	0.33	4	1.75		
Frequency of cleaning						
Once	163	53.62	187	81.66	56.43	<0.001*
Twice	140	46.05	38	16.59		
None	1	0.33	4	1.75		

Table 3: Distribution of subjects according to Maximum CPI scores.

CPI Scores	RURAL		URBAN	
	No.	%	No.	%
0	11	3.62	63	27.51
1	31	10.20	105	45.85
2	62	20.39	39	17.03
3	113	37.17	13	5.68
4	87	28.62	9	3.93

$\chi^2=76.179$ (df=4); $p<0.001^*$, *: statistically significant

Table 4: Distribution of subjects according to Maximum LOA scores.

LOA Scores	RURAL		URBAN	
	No.	%	No.	%
0	83	27.30	188	82.10
1	129	42.43	35	15.28
2	81	26.64	5	2.18
3	11	3.62	1	0.44
4	0	0.00	0	0.00

$\chi^2=36.258$ (df=4); $p<0.001^*$, *: statistically significant

well-being. Rural populations continue to experience marked disparities in health and health care access. Oral health disparities are also noticeable as affected by above mentioned factors³.

Epidemiological studies assessing the periodontal status of school children have been conducted in Jamshedpur city. However the periodontal status of urban and rural adult population is scarcely available. Hence there was a constant need to evaluate the periodontal status of adults and analyze the comparison between urban and rural population. The data would serve as baseline data for formulating strategies for oral health prevention and treatment in the region.

MATERIAL & METHODS

A population representative study of adults aged 20 – 49 years of rural Jamshedpur was conducted from January 2018 to March 2018. Ethical clearance for the study was granted by Awadh Dental College, Jamshedpur. For estimating the sample size, the minimum expected prevalence of periodontal diseases was considered as 80%. This was based on results obtained during a pilot study conducted in study area. The sample size was estimated to obtain the true value at 5% level of significance. Estimated

sample size of 550 subjects was calculated. Therefore 250 urban and 250 rural subjects were required for the present study.

Multistage sampling technique was adopted to collect the final sample. Jamshedpur city was divided into four geographical zones – north, south, east and west. From each zone 3 rural and 3 urban sites were randomly selected to obtain representative sample of that particular zone. Subjects residing in rural and urban area for 10 and more years were considered eligible for the study. Exclusion criteria included edentulous persons and those who were medically compromised. After applying exclusion criteria, the final sample size comprised of 304 rural subjects and 229 urban subjects.

The survey was carried out using a self-designed questionnaire, to record the demographic data and information regarding oral hygiene practices. Periodontal health was assessed using WHO criteria which included Community periodontal index and Loss of Attachment assessment using CPITN probe⁴. Socio economic status was evaluated by Prasad's classification (1961)⁵ based on per capita monthly incomes.

A complete clinical periodontal exam was performed by one single examiner. Intra-examiner calibration was performed before the study began. The intra-examiner degree of agreement ($\kappa = 0.88, 0.82, 0.83, \text{ and } 0.84$) for calculus detection, bleeding on probing, probing depth and clinical attachment loss, respectively.

Portable equipment was used to ensure ease of transportation to the examination sites. An adequate infection control was maintained throughout the survey. The cold sterilization procedure was carried out in the survey with Gluteraldehyde (15%) solution by immersing the used and washed instruments for about 20-30min. The areas for conducting examinations were chosen for maximum efficiency and ease of operation. It was taken care that an adequate illumination of natural light was available and any noise or crowding was avoided to make sure proper examination and recording. The examinations were carried out by wearing disposable masks and gloves and protective glasses. The digital manipulation of the oral tissues was avoided where it was found unnecessary to reduce the risk of cross-infection. The data was analyzed using SPSS software. Chi square test was used to test the level of significance of differences among the groups with statistical significance level set at <0.05 .

RESULTS

Table 1 shows the distribution of subjects according to age, gender and socioeconomic status. The number of subjects in 20–29 year age group in urban population was 127 (55.46%) and in rural population was 184 (60.53%). The number of subjects in 30–39 year age group in urban population was 78 (34.06%) and in rural was 67 (22.04%). Statistically, there was no significant difference in age of subjects in two groups ($p=0.57$). Urban population consisted of 117 (51.09%) males and 112 (48.91%) of females, whereas in rural population there were 165 (54.28%) males and 139 (45.72%) females. On comparing the data statistically, the difference was not found to be significant ($p=0.317$). Distribution of subjects according to Socioeconomic Status showed that out of total subjects, 25 (10.92%) from urban population and 114 (37.5%) from rural population were poor or very poor. Out of total 80 (34.94% of urban population were of high or very high class with

none of rural population in this class. Statistically, there was a significant difference in socioeconomic strata of subjects in two groups ($p<0.001$).

In both the groups toothpaste was the most common material used for cleaning teeth, brushing teeth was the most common method of cleaning and cleaning teeth once a day was most commonly practiced frequency of dental care. There was statistically significant difference between the groups for material and method used for oral hygiene practice as well as frequency of oral hygiene practice ($p < 0.001$) as shown in table 2.

As compared to rural population, urban population had significantly higher proportion of subjects with maximum CPI scores of lower order (1 and 2) whereas significantly higher proportion of subjects in rural population had maximum CPI scores of higher order (3 and 4) ($p<0.001$) as shown in table 3.

Significantly higher proportion of urban subjects had maximum LOA scores 0 as compared to that of rural subjects ($p<0.001$). The rural subjects had significant higher LOA scores when compared with urban subjects (table 4).

DISCUSSION

Despite great achievements in the oral health of populations globally, problems still remain in rural communities around the world. Periodontal diseases have historically been considered the most important global oral health burdens. The current epidemiological survey was conducted to assess the periodontal status of adults (20-49 years) residents of Jamshedpur. The intention of study was to provide systematic information on periodontal status of the adult population and that results would aid in the planning/evaluation for prevention and oral health promotion programme.

The periodontal status was assessed using the Community Periodontal Index and measurement of Loss of Attachment. The prevalence of periodontal diseases among study subjects overall was 86.11%. Rural group had higher prevalence (96.38%) in comparison to urban group (72.49%). The prevalence rate for periodontal disease nationwide for 35-44 year age group was 89.2% according to National Oral Health Survey & Fluoride Mapping⁶. A study done by Chinmaya et al⁷ at Chitradurga

showed that 92% of population in sample was suffering from one the other form of periodontal disease. A study cited by Singh et al⁷ done by Rao et al in Sevagram in urban, rural tribal school children, found that there was no significant difference in prevalence of periodontal diseases in urban and rural areas for the age group studied.

The finding in our study showed that code 3 was most prevalent in rural population whereas code 1 for urban population. It is in contrast with results of studies done by Shah et al⁹ and Khamrco et al¹⁰ who found code 2 as the most predominant score.

As compared to rural group, urban group had significantly higher proportion of subjects with maximum CPI scores of lower order (1 and 2) whereas significantly higher proportion of subjects in rural group had maximum CPI scores of higher order (3 and 4). The proportion of subjects with code 4 in rural group was 28.62% whereas in urban group it was 3.93%. The difference in urban and rural population is in agreement with a study conducted by Karmathet al¹¹. It has been shown that poor educational background and low socio-economic status was responsible for increased prevalence of periodontal disease in rural population.

The present study showed that significantly higher proportion of urban group subjects had maximum LOA scores 0 as compared to that of rural group subjects. 15.28% subjects of urban group and 42.43% of rural group were having score 1, whereas score 2 was seen in 2.18% subjects of urban group and 26.64% of rural group subjects. A study done by Karmathet al¹¹ reported that urban population had higher proportion of subjects with code 0 and with rest other codes (code, 2,3 and 4) were fewer in comparison to rural population. A contrasting study done by Singh et al⁸ showed that subjects residing in urban areas had higher loss of attachment as compared to subjects belonging to rural areas. Results of present study are in contrast with a study conducted by Gokalpet al¹² who reported that loss of attachment was lower in urban settings than rural. Another study done by Krusturpet al¹³ reported that code 1 was more prevalent in rural group than urban group similar to findings of current study.

CONCLUSION

It can be well appreciated from the results that rural populations were suffering from periodontal diseases as compared to urban populations. Therefore, to improve the periodontal health status of rural population of Jamshedpur, it is suggested that a community-based approach can be designed with an initial curative care followed by a long term preventive care can be appropriate. Since the literacy rate is low in rural area in comparison to urban area, in rural area more emphasis should be laid on the behavioural sciences and community-based oral health education by addressing the importance of oral hygiene and making aware of deleterious effects of substance abuse on oral health. Training of health workers, anganwadi workers and school teachers to educate the target groups such as mothers and school children can also be useful.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Shah N. Oral and dental diseases: Causes, prevention and treatment strategies, NCMH Background Papers Burden of Disease in India.
2. Englander HR, Kesel RG, Gupta OP. The Aurora-Rockford Ill, study II. Effect of natural fluoride on the periodontal health of adults. *Am J Public Health* 1963; 53(8):1233-1242.
3. Chandramouli C. Rural urban distribution of population. *Census of India* 2012.
4. WHO. Oral health surveys basic Methods, 4th Edition 1997.
5. Agarwal AK. Social Classification: the need to update in present scenario. *Indian Journal of Community Medicine* 2008; 33(1): 50-51.
6. Bali R K. National oral health survey & fluoride mapping 2002-2003 INDIA. Dental council of India.
7. Chinmaya BR, Shaik HAKH, Srivastava BK, Pushpanjali K. Oral health status and treatment needs in Chitradurga, India and strategies to meet the needs. *AOSR* 2011;1(1):14-25.

8.Singh GPI , Bindra J, Soni RK , Sood M. Prevalence of Periodontal Diseases in Urban and Rural areas of Ludhiana, Punjab. Indian Journal of Community Medicine 2005; 30 (4): 128-29.

9.Shah S C. An Epidemiological Study In Gujarat By Community Periodontal Index Of Treatment Needs (CPITN). Annals and Essences of Dentistry 2010; 2(4): 30-32.

10.Khamrco TY. Assessment of periodontal disease using the CPITN index in a rural population in Ninevah, Iraq. East Mediterr Health J 1999; 5(3): 549-55.

11.Kamath DG, BRR Varma, Sai Giridhar kamath, Ramya Shenoy Kudpi: Comparison of periodontal status of urban and rural population in Dakshina Kannada district, Karnataka state. Journal of Oral Health and Community Dentistry 2010;4(2): 34-37.

12.Gökalp SG, Doğan BG, Tekçiçek MT, Berberoğlu A, Unlüer S. National survey of oral health status of children and adults in Turkey. Community Dent Health 2010; 27(1): 12

13. Krustrup U, Petersen PE. Periodontal conditions in 35-/44 and 65-/74-year-old adults in Denmark. Acta Odontologica Scandinavica, 2006; 64: 65-73.