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An Epidemiological Data of Oral Health Status and Treatment Needs in Pamulapadu Village of Guntur District, Andhra Pradesh, India: An Original Research

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ABSTRACT

Introduction: As India is the second highest populated country and approximately 72% of population lives in rural areas, an attempt has been made to assess the prevalence of oral diseases in rural areas. Hence in our study we aimed to assess the prevalence of oral diseases in the individuals in Pamulapadu village of Guntur district Andhra Pradesh, India.

Materials and Methods: A cross-sectional survey was carried out using multistage cluster sampling methodology, and random samples of participants were selected. Data were collected on sociodemographic details, oral hygiene practices, and clinical oral health data collected according to the World Health Organization methodology criteria and simplified oral hygiene index. Data were analyzed using Chi-square test and linear and logistic regression.

Results: A total of 400 participants were considered**.** Among 35–44 and 65–74 years age group, 54.1% and 42.2% of the population showed poor oral hygiene status. At age 12 years, 51% of children had caries; mean decayed, missing, filled teeth was 3.24 in 35–44 years and 12.01 in 65–74 years. Community periodontal index score 2 was dominant in 12 years old (30.5%) and 35–44 years old (54.6%) and score 3 in 65–74 years (46.9%) population. All the independent variables were related to caries and periodontal status ($P < 0.05$).

Conclusion: The study population was characterized by high prevalence of dental caries, periodontal diseases, and poor oral hygiene status, and age of the population is the most associated factor for dental caries and periodontal diseases.

Key words: Dental caries, periodontal diseases, prevalence, rural population.

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INTRODUCTION

The mouth is a window into the health of the body. Maintaining good oral health means being free from pain in the oral and facial region; absence of oral sores and lesions; free from periodontal diseases, dental caries, tooth loss, and many other diseases and disorders that affect oral cavity.[1] Oral health is considered as an important component of public health, and oral diseases are among the preventable noncommunicable diseases.India is the second highest populated country with more than two billion population, out of which approximately 72% live in rural areas and 28% live in urban areas.[2,3] The dentist to population ratio is 1:10,000 in urban areas and 1:250,000 in rural areas.[3]Evidence has shown that there exist disparities in oral health status of urban and rural populations.[4,5] Majority of the epidemiological studies in India that have been published are focused on school children,[6,7] and studies done on people living in rural areas covering all indexed age groups appear to be fewer and limited, which is essential for oral health service for the population. In a study on rural women, prevalence of dental caries was 60.2% and it was found that age is the most associated risk factor for caries.[8] The caries prevalence rates among 30–35 years aged population in West Bengal, Orissa, and Sikkim were 18.1, 24.5, and 20.1%, respectively.[9] A study in rural Moradabad showed 91.2% prevalence of periodontal diseases among 40–49 years age group.[10]The World Health Organization (WHO) recommends basic oral health surveys in five selected age groups (i.e., 5 years, 12 years, 15 years, 35–44 years, and 65–74 years)[11] to estimate the magnitude of the problem and to plan intervention activities. Thus, in the light of above situation, this study was conducted with an aim to assess the prevalence of oral diseases and treatment needs among in the elderly individuals in Pamulapadu village of Guntur district Andhra Pradesh, India.

MATERIALS AND METHODS

A cross-sectional survey was carried out at Pamulapadu village of Guntur district Andhra Pradesh, India, using multistage cluster sampling methodology, and random samples of participants were selected.After ethical approval from the Institutional Ethical Board, examiners were calibrated in the Department of Public Health Dentistry before the pilot study. Random samples of people of the WHO standard ages were selected based on the recent population census. The final sample included 4 age groups: 5 years, 12 years, 35–44 years, and 65–74 years.Data collection was done using a structured pro forma consisting of questionnaire and clinical examination. The questionnaire consisted of demographic details, socioeconomic status,[12] and oral hygiene practices.[13] A single examiner, the investigator, clinically examined all the participants. All the subjects were examined under adequate illumination (Type III) using plane mouth mirror, curved sharp sickle explorer (standard explorer), and WHO probe.Oral hygiene status was assessed using simplified oral hygiene index (OHI-S).[14] Dentition status and treatment needs, enamel opacities, oral mucosal lesions, community periodontal index (CPI), and dentofacial anomalies in children of 5 and 12 years, adults of 35–44 years and 65–74 years age groups were assessed based on modified WHO pro forma 1997.[11]Means of decayed, missing, filled teeth (DMFT) and their components along with oral hygiene scores in each age group are calculated, and Chi-square test was used to analyze the data. Data were entered and analyzed using a software program IBM SPSS Statistics version 22 (Armonk, NY:IBM Corp) ($P < 0.001$).

RESULTS

In a total sample of 400 participants, sample comprises 50.5% males and 49.5% females. Majority of the participants clean their teeth once daily [99.5%]; among them, majority of subjects use toothbrush, 89.8% and fluoridated dentifrice, 87.8% and 51.5% participants rinse

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their mouth more frequently.In 12 years age group, 69.2% of subjects showed fair oral hygiene and 30.8% showed good oral hygiene status. Among 35–44 years and 65–74 years old age groups population, 54.1% and 42.2% showed poor oral hygiene status. Excluded sextants are 47.9% in older population. Dmft score in 5 years age group is 39.3%, 12 years age group is 53%, and 35–44 years age group is 77.3%. Among 35–44 years old age group, subjects decayed component contribute 64.7% of DMFT. In 65–74 years old age group, the total DMFT score is 81.8% and most of it is contributed by missing component which is about 77.1%.The difference in mean component score (OHI-S) and cumulative scores between various groups was highly significant ($P < 0.001$). In mean caries experience, the D-component contributed most to the DMFT index which was also seen similar in children, young adults, and whereas in older people, M-component contributed to the most. Comparison between multiple groups was done using Kruskal–Wallis tests [Table 1].Logistic regression analysis was employed to determine the contribution of age, rinsing habit, use of fluoride toothpaste, and substance used for cleaning to periodontal status [Table 2]. All independent variables were statistically significantly related to periodontal status, except material used to clean teeth. The association between age of the subjects and their periodontal status was evident with an odds ratio (OR) of 36.09 times in the elderly age group. Subjects who rinse their mouth were less likely to have periodontal disease than those who never or sometimes with an OR of 0.08. Subjects using nonfluoridated toothpaste are more likely to have periodontal disease of 3.05 times than subjects using fluoridated toothpaste. Table 2

TABLE 1 Oral hygiene status and dental caries in the study population

		Sum of Squares	df	Mean Square	F	Sig.
DT	Between Groups	58.866	5	11.773	1.362	.238
	Within Groups	3388.802	392	8.645		
	Total	3447.668	397			
MT	Between Groups	1855.791	5	371.158	17.556	.000
	Within Groups	8287.196	392	21.141		
	Total	10142.987	397			
FT	Between Groups	16.190	5	3.238	1.295	.265
	Within Groups	979.921	392	2.500		
	Total	996.111	397			
DMFT	Between Groups	2306.529	5	461.306	15.655	.000
	Within Groups	11551.213	392	29.467		
	Total	13857.742	397			
DI-S SCORE	Between Groups	3.067	5	.613	1.610	.156
	Within Groups	149.363	392	.381		
	Total	152.430	397			
CI-S SCORE	Between Groups	7.460	5	1.492	3.126	.009
	Within Groups	187.117	392	.477		
	Total	194.577	397			
OHI-S SC	Between Groups	20.083	5	4.017	2.499	.030
	Within Groups	630.023	392	1.607		
	Total	650.107	397			

Table 2: Logistic regression analysis

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.825[a]	10	.549

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Likelihood Ratio	10.583	10	.391
Linear-by-Linear Association	.106	1	.744
N of Valid Cases	400		

DISCUSSION

In all age groups, around 89.8% of this study population used toothbrush and toothpaste for cleaning their teeth which is higher than the data compared with overall respondent in the National Oral Health Survey and Fluoride Mapping 2002–2003 (46.37% and 51.9%)[13] and previous studies.[10,15] In our study, mouth rinsing (51.5%) was the most adopted other oral hygiene aid by many people which is similar to the data of the National Oral Health Survey and Fluoride Mapping 2002–2003[13] and other study conducted in 2013.[15]In our study, Mean values of the OHI of all age groups and its components were high, which suggest a widespread and almost uniform neglect of tooth cleaning, which became more pronounced with age. In our study, the mean OHI-S score of 35–44 years age was about 3.50 which is in accordance with the previous study conducted in rural population of Ambala district, Haryana.[17] In our study, prevalence of malocclusion in 12 years old population was about 31.5% (definite and severe) which is in accordance to prevalence (30.84%) reported in the previous study[18] and in contrary to prevalence (8.46%) reported by another study[19] and is higher than the prevalence found in the National Oral Health Survey and Fluoride Mapping 2002–2003.[13]In this study, prevalence of dental caries in 5 years and 12 years old population was 39.3% and 53% which was higher than the findings of the previous study[20] and was similar to the findings of the National Oral Health Survey and Fluoride Mapping 2002–2003.[14] The prevalence of dental caries in 35–44 years old study population was 77.3% which was similar to a previous study[17] and with the National Oral Health Survey and Fluoride Mapping 2002–2003 (79.6%).[13] The results of stepwise multiple linear regression analysis of the caries status in relation to several independent variables showed evidence that the most significant contributor for DMFT was age which was explained with a variance of 39.9%. This might be because of irregular oral hygiene practices. These findings on periodontal status correspond to the results of the previous study.[4] The overall prevalence of periodontal disease was high among 65–74 years age group and 35–44 years age group subjects in this study which is similar to a previous study.[5] In this study, periodontal status and oral hygiene status deteriorated with age and tooth loss increased with age.Previous study suggests that age, gender, education, and oral hygiene status as risk factors for periodontal disease. In this study, the rural population exhibits low education, poor oral hygiene, and placing them in a high-risk group for periodontal disease. The results of logistic regression analysis with CPI as dependent variable showed that the association between age of the subjects and their periodontal status was evident. The overall prevalence of score 1 (bleeding) of CPI in 12 years old study population was 69% which was higher than the report of the National Oral Health Survey and Fluoride Mapping 2002–2003 rural population (26.3%).[12] The overall prevalence of score 2 (calculus) and score 3 (shallow pockets) of this study in 35–44 years was 54.6% and 40.6% which was similar to previous study[22] and slightly lower than the scores reported by the National Oral Health Survey and Fluoride Mapping 2002–2003 (52.0% and 20.0%).[13]This survey reported high levels of gingival bleeding and calculus and low scores of advanced periodontal symptoms. These conditions are preventable, primarily through proper oral hygiene practices. The periodontal conditions tended to be relatively poor among people living in rural areas, and this study demonstrated the same and their periodontal status with OR of 2.3 times more in older age group.Overall, this survey has provided a valid overview of the oral disease status at the population level. Having found significant relationships between caries status, periodontal

status, and several independent variables, perhaps, future programs can be developed in rural India to improve oral health practices which in turn may bring about an improvement in oral health status. In addition, we recommend including oral health component in the National Health Policy 2015 to reduce oral health problems in later years.The strength of this study was that it included four WHO-recommended index age groups and followed multistage cluster sampling methodology. Although several studies have reported on the oral health status and treatment needs of school children in India, there is scarce literature on rural population including all WHO index age groups. Hence, further research is needed to investigate the oral health of the various rural populations which should include large sample size.

CONCLUSION

Rural population is characterized by high prevalence of periodontal diseases, dental caries, poor oral hygiene, high treatment needs, and lack of dental care. Under these circumstances, there is a great need to educate and motivate population toward oral health and also to increase awareness about available facilities and the implementation of a basic oral health care program for the population and inclusion of oral health component in national oral health policy.

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