

Assessment of oral health status and treatment needs amongst the tribals residing in Northern Bhubaneswar, Odisha

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ABSTRACT

Introduction: Odisha has the third highest percentage of tribal population in India. This study was conducted to evaluate the oral health status and treatment needs of tribal population residing in northern Bhubaneswar. **Material and Methods:** A cross-sectional household survey was conducted using the modified WHO Oral Health Assessment Form (2013). Cluster random sampling technique was employed. Type III clinical examination was done. Statistical analysis was carried out using Chi square test, t test and ANOVA. **Results:** A total of 877 participants were examined out of which 589 were males and 288 females with age ranging from 2–74 years. The mean dmft score was 4.13 ± 0.73 in 2–5-year-old participants, and in the age groups of 35–44 years and 65–74 years, the scores were 5.32 ± 2.36 and 7.56 ± 4.29 respectively. Statistically significant differences were observed in the presence of healthy gums, bleeding gums and presence of shallow pockets across the different age groups. Preventive treatment was required mostly by the participants in the age group 13–15 years. **Conclusion:** The present study showed a high prevalence of dental caries and periodontal disease among the study participants. Preventive treatment was required mostly by the participants in the age group 13–15 years.

Keywords: DMFT, Oral health, treatment need, tribal people

Introduction

Oral health is a vital component of overall health and is much more than just healthy teeth. It is a functional, structural, aesthetic, physiologic and psychological state of well being and is essential to an individual's general health and quality of life.^[1] Dental disease such as periodontitis is found to be considerably higher in developing countries.^[2]

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India has many communities which are backward in terms of social, economic, political and educational considerations. Tribal community is one such community. Odisha occupies a unique position among the Indian States and Union Territories for having a rich and colorful tribal scenario. According to the Scheduled Castes and Scheduled Tribes Research and Training Institute Odisha state has the third highest percentage of tribal population in the country.^[3]

Despite adequate advancements in global oral health, problems still persist in many communities around the world, particularly among the underprivileged.

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Though numerous studies have been conducted on the tribal population of Odisha, very few studies report the oral health status and treatment needs of the tribals in Odisha. Therefore, we conducted this study with the aim to evaluate the oral health status and treatment needs of tribal population residing in northern Bhubaneswar.

Material and Methods

Study design and Sampling Design

A cross-sectional household survey was conducted in the months of July to September 2019. The population list was obtained from the Statistical wing of Scheduled Caste & Scheduled Tribes Research and Training Institute (SCSTRTI), Bhubaneswar. A cluster random sampling procedure was used for the sample selection. Bhubaneswar is divided into three zones which are northern, south-west and south east zone. The northern zone was selected randomly and out its 26 wards, 2 wards were randomly selected using lottery method (Ward 1 and 2). The tribes residing in these wards were included in the study.

Sample size

The sample size was calculated using the formula: $n = z^2 pq/d^2$, where n is sample size, P prevalence of disease, q free from disease, d allowable error and z is point on the normal deviation. The sample size thus arrived at was 877 participants.

Informed consent

A written informed consent was obtained from all the participants willing to participate in the study.

Ethical approval

The ethical approval was obtained from the Institution Board. KIMS/KIIT/IEC/26/2018.

Survey proforma

A modified World Health Organization (WHO) Oral Health Assessment Form (2013) was utilized to record the information related to oral health.

Training and calibration

A single examiner was trained and calibrated in the department to prevent any diagnostic variability among the study participants. Clinical examination was conducted by the principal investigator with the help of recording assistants.

Data collection

Community Periodontal Index (CPI) probe and a plane mouth mirror was used and type III clinical examination was carried out under adequate natural light. All the participants who were present on the day of examination were included in the study.

Statistical analysis

The recorded data was analyzed using the Statistical Package for the Social Sciences version 25 (SPSS Inc., Chicago, Illinois, USA).

Descriptive statistics included computation of percentages, means and standard deviation. The statistical tests applied for the analysis were Chi square test, student's t test and one way analysis of variance. The level of significance was set at 0.05 with 95% confidence interval.

Results

A total of 877 participants were examined in the study out of which 589 were males and 288 were females with age ranging from 2–74 years. Around 394 (44.92%) participants were daily wage laborers and 153 (17.45%) worked as drivers. Most of them consumed more than one form of tobacco. Majority of the participants consumed paan [Table 1].

The mean decayed, missing, and filled tooth (dmft) score was 4.13 ± 0.73 in 2–5-year-old participants, and in the higher age groups of 35–44 years and 65–74 years, the scores were 5.32 ± 2.36 and 7.56 ± 4.29 respectively. A statistically significant association was found between all the age groups, except for the 65–74 age group [Table 2].

Table 3 depicts the mean number of sextants with periodontal disease conditions, as scored by CPI. Participants with bleeding gums were predominantly seen in the age group of 35–44 years (1.03 ± 0.08). Shallow pockets were more commonly seen in the age group of 35–44 years (1.64 ± 0.11) while deep pockets were predominant in the age group 65–74 years (0.65 ± 0.17).

Table 1: Characteristics of the study participants

Characteristics of study participants	n %
Age	
2-5 years	171; 19.50%
6-12 years	182; 20.75%
13-15 years	214; 24.40%
35-44 years	235; 26.80%
65-74 years	75; 8.55%
Gender	
Male	589; 67.16%
Female	288; 32.84%
Occupation	
Daily wage worker	394; 44.92%
Driver	153; 17.45%
Gov/private jobs	79; 9.00%
Student	93; 10.60%
Housewife	158; 18.02%
Oral hygiene practices	
Twig	590; 67.27%
Tooth brush	125; 14.25%
Finger	106; 12.09%
Others	56; 6.39%
Habit	
Paan	678; 77.31%
Gutkha	235; 26.80%
Cigarette/bidi/smoked tobacco	168; 19.16%
Khaini/smokeless tobacco	347; 39.57%
Others	79; 9.01%

Table 2: Distribution of mean DMFT scores across the age groups

Age group	dt	mt	ft	dmft	DT	MT	FT	DMFT	P
2-5 years	3.69±0.29	0.21±0.29	0.23±0.15	4.13±0.73	0.0	0.0	0.0	0.0	0.001
6-12 years	3.03±1.29	0.48±0.18	0.49±0.17	4±1.64	0.50±0.28	0.70±0.03	0.09±0.14	1.29±0.45	0.003
13-15 years	0.0	0.0	0.0	0.0	1.56±0.30	1.48±0.04	0.14±0.01	3.18±0.35	0.012
35-44 years	0.0	0.0	0.0	0.0	2.71±1.03	2.45±1.25	0.16±0.08	5.32±2.36	0.005
65-74 years	0.0	0.0	0.0	0.0	1.67±1.05	5.87±3.23	0.02±0.01	7.56±4.29	0.571

Table 3: Mean number of sextants as scored by CPI across age groups

Age group	Healthy	Bleeding	Calculus	Pocket (4-5 mm)	Pocket (±6 mm)
6-12 years	3.08±1.46	0.54±0.06	1.67±0.24	0.0	0.0
13-15 years	3.05±1.03	0.73±0.09	3.15±0.44	0.0	0.0
35-44 years	1.08±0.06	1.03±0.08	1.63±0.73	1.64±0.11	0.54±0.23
65-74 years	0.0	0.17±0.03	1.33±0.71	1.05±0.12	0.65±0.17
P	0.001	0.025	0.512	0.002	0.671

Statistically significant differences were observed in the presence of healthy gums, bleeding gums and presence of shallow pockets across the different age groups.

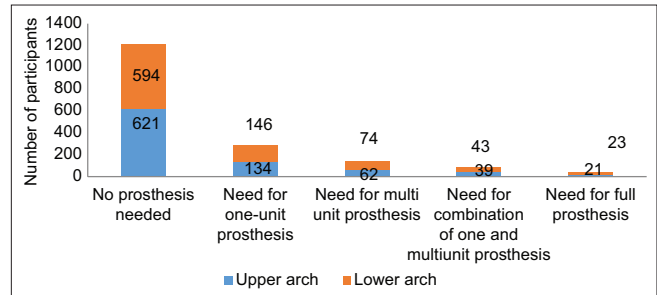
Around 154 participants in the age group 2–5 years needed no treatment. Preventive or routine treatment was required mostly by the participants in the age group 13–15 years. Majority of the participants in the age group 35–44 years needed prompt treatment including scaling while those in the age group 65–74 years required immediate treatment and referral for comprehensive care [Table 4].

Figure 1 shows the distribution of the study participants according to the prosthetic need. A total of 280 (31.93%) participants needed one-unit prosthesis. Around 21 (2.39%) participants required full prosthesis in the upper jaw and 23 (2.62%) participants needed full prosthesis in the lower jaw.

Majority of the participants (59; 6.73%) had other oral mucosal lesions like smokers melanosis, hyperpigmentation, dry mouth and tobacco pouch keratosis [Figure 2]. Around 510 participants had loss of attachment (0–3 mm), while 170 participants had loss of attachment of 4–5 mm [Figure 2].

Discussion

The present study was carried out on the tribals residing in northern zone of Bhubaneswar, Odisha. Around 877 tribals participated in the study, out of which the majority were males and belonged to the age group 35–44 years. Daily wage work was found to be the major sources of income for them. In a study done on Santhal tribes in Dhanbad, Jharkhand, it was found that agriculture was the main source of income for the tribals.^[2] Majority of the tribals who participated in the study used twig for cleaning their teeth. This was in contrast to the findings of Vijayakumar N *et al.*^[4] where majority of the study population 576 (65%) used brick powder for brushing their teeth and only

**Figure 1: Prosthetic treatment needs of the study participants**

10% used neem stick. Most of the participants in this study consumed multiple forms of tobacco. A study done among the Narikuravars or “gypsies” of Thoothukudi district, revealed that among the adult population 64.55% were tobacco users and smokeless tobacco was the most common form used.^[5]

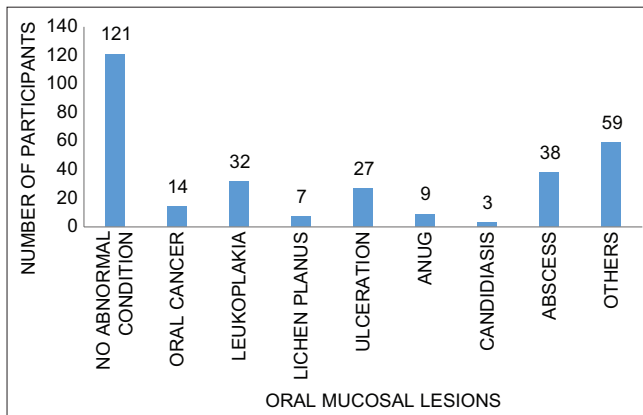
The mean decayed, missing, and filled tooth score was 4.13 ± 0.73 in 2–5-year-old participants, and DMFT scores were higher for the age group 65–74 years. The findings of this study were consistent with that of Maurya R *et al.*^[6] and Lang *et al.*^[7] Mandal *et al.*^[8] reported that the average decayed, extracted and filled teeth (deft)/DMFT in deciduous, mixed and permanent dentition were 1.32, 1.21 and 0.99 respectively. In a similar study it was observed that the mean dmft/DMFT values for 5- and 12-year-old were 4.13 ± 3.90 and 1.15 ± 1.62 respectively.^[9]

Participants with bleeding gums were predominantly seen in the age group of 35–44 years (1.03 ± 0.08). In a study done on the Todas tribe the mean number of gingival bleeding sextants observed was $2.63 + 2.180$ whereas in the Kotas tribe it was found to be $2.16 + 1.914$.^[10] In our study shallow pockets were more commonly seen in the age group of 35–44 years while deep pockets were predominant in the age group 65–74. This was found to be in agreement with studies done by Kumar VK *et al.*^[11] and Singh *et al.*^[12] However in a study done on Birhor tribe revealed that bleeding gums were predominant in the age group of 2–5 years and shallow pockets in the age group of 16–34 years.^[13] Singh A *et al.*^[9] found that bleeding on probing and calculus was common between both 5- and 12-year age groups and that the mean number of healthy sextants decreased with age.

Preventive or routine treatment was required mostly by the participants in the age group 13–15 years. Majority of the participants in the age group 35–44 years needed prompt treatment including scaling while those in the age group 65–

Table 4: Distribution of age groups according to treatment needs

Age group	No treatment needed n; %	Preventive or routine treatment needed n; %	Prompt treatment including scaling needed n; %	Immediate treatment needed n; %	Referred for comprehensive evaluation n; %
2-5 years	154; 91.81%	17; 9.94%	0	0	0
6-12 years	88; 43.35%	43; 23.63%	33; 18.13%	18; 9.89%	0
13-15 years	59; 26.70%	76; 34.39%	46; 20.84%	16; 7.24%	24; 10.86%
35-44 years	11; 6.15%	45; 25.14%	82; 45.81%	4; 2.23%	37; 20.67%
65-74 years	0	4; 4.04%	9; 9.09%	40; 40.40%	46; 46.46%
P	0.004	0.001	0.032	0.045	0.021

**Figure 2: Prevalence of oral mucosal lesions**

74 years required immediate treatment and referral for comprehensive care. Similar findings were reported by Naidu *et al.*^[14] Vijayakumar N *et al.*^[4] reported that the treatment needs among Sugali tribe showed that 50.24% of the study population needed one surface restoration, 10.36% needed two surface restorations, 26.34% needed pulp care and 47.43% needed extraction. Kumar TS *et al.*^[15] reported that extraction was the most required treatment followed by one surface fillings among the Bhil adult tribe of Rajasthan.

Around 31.93% of the participants needed one-unit prosthesis. Among those who needed prosthesis, majority (19.51%) of the participants needed one-unit prosthesis in a study done by Vijayakumar N *et al.*^[4]

Majority of the participants had oral mucosal lesions like smokers melanosis, hyperpigmentation, dry mouth and tobacco pouch keratosis. Vijayakumar N *et al.*^[4] reported that in their study, majority of the population 65% had no abnormal condition of oral mucosa.

Around 510 participants had loss of attachment (0-3 mm), while 170 participants had loss of attachment of 4-5 mm. In a similar study done by Kumar, Dileep, Sethi and Gupta (2019) it was found that around 298 (74.5%) subjects had periodontal loss of attachment (LOA) of 0-3 mm.^[13] Similar findings were reported by Das D *et al.*^[16] in a study done on Juang tribe.

The results of this study shall form a baseline data for the health administrators of Bhubaneswar for planning oral health

programs specially designed to foster the needs of the tribals in all the zones of Bhubaneswar, as well as across the State of Odisha.

The findings of this study cannot be extrapolated to the other development blocks in the District because of the large differences in the socio-demographic factors. However, this limitation can be overcome by a larger sample size drawn from across the district and undertaking studies of a longitudinal nature.

Conclusion

The present study showed a high prevalence of dental caries and periodontal disease among the study participants. Preventive or routine treatment was required mostly by the participants in the age group 13-15 years. Primary care physicians can take an initiative to enhance awareness towards oral health care by providing education and counseling to the tribal communities residing in Bhubaneswar and Odisha.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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