Original Article

DOI: 10.7860/JCDR/2016/21535.8631

Dentistry Section

Oral Health Status and Treatment Needs of Paniya Tribes in Kerala

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ABSTRACT

Introduction: The tribal communities of Kerala have been largely left out of the gains of the Kerala model of development.

Aim: The study was aimed to obtain baseline data of oral health status and treatment needs of Paniyas, in Kerala, India.

Materials and Methods: A descriptive population based survey of adult Paniya belonging to index age groups of 35-44 years and 65-74 years was conducted. The study population comprised of 420 subjects drawn from three talukas by stratified cluster sampling. Modified version of WHO Oral Health Assessment Form (1997) was used to assess the oral health status.

Results: Caries prevalence was 40%. The mean DMFT in the 35-44 years age group was 1.52±1.95 and in 65-74 age group it was 18.47 ± 13.10. Oral mucosal lesions were seen in 4.52% and 76.9% had periodontal disease. Tooth brushing was reported by 55.5% of the subjects. Paan chewing, with tobacco or without tobacco, habit was reported by 89.3%. Bi-variate analyses between the CPI scores and age groups showed high statistical significance. The maximum mean treatment requirement was for extraction (1.37 ± 4.01) and was observed in 65-74 age groups.

Conclusion: The lack of basic oral health care access is important for high oral disease burden in these populations. Efforts are to be done for basic oral health care facility to these marginal populations.

Keywords: Indigenous population, Prevalence, Tribal communities

INTRODUCTION

Widening inequities in oral health status and treatment needs exist among different social groupings and even within various countries [1]. There are people still living in isolation in natural and unpolluted surroundings with their traditional values, customs and beliefs. They are commonly known as " Tribals" and are considered to be the autochthonous people of the land [2]. The tribals constitute a substantial indigenous minority of the population in India, comprising of 9.01% of the nation's total population, according to 2011 census data. About 82% of the total tribal population is concentrated in Central and Western parts of the country whereas only 11% is dispersed in small pockets in the Southern states [3]. Wayanad has the highest tribal population in Kerala. Majority of the tribes are Paniyas [4]. It has been reported that the tribal communities of Kerala has been largely left out of the gains of the Kerala model of development [5]. The oral health status has been assessed in different tribes of the India as shown in [Table/Fig-1a].

In case of tribal communities in Kerala there is no reliable data on the oral health indices [4]. Hence, the present study was undertaken with the objective to assess the oral health status and oral hygiene practice of Paniya tribes.

Author	Tribes in India	Oral Health Findings
Santhosh K et., (2009) [2]	Bhil tribes in Southern Rajasthan	DMFT scores were 5.34
Shanavas Palliyal (2010) [3]	Paniya and Kurichya group of tribal's in Wayanad	Oral mucosal conditions were (22.2%). periodontitis was high among the Paniya
Bhat & Kadanakuppe S (2010) [6]	Iruliga' tribal community residing at Ramanagar district, Karnataka	Low prevalence of periodontal disease due to use of chew sticks
Vivek S et al., (2012) [7]	Paniya Tribes	59.4% Paniyas neglected the oral health care
Biju Philip., (2013) [8]	Tribes in Nilgiris	(73.6%) had periodontal disease

[Table/Fig-1a]: Oral health status across different tribes in India.

MATERIALS AND METHODS

The study design was cross-sectional in nature. Stratified cluster sampling design was adopted. Stratification was done according to the two 'Index age groups' were considered: 35-44 years, 65-74 years consistent with WHO pathfinder methodology [9,10].

Exclusion Criteria

1. Chronically ill patients with restricted movements,
2. Non-Paniya tribes,
3. Subjects who do not consent to the examination.

A pilot study was conducted to check the feasibility of the study and the prevalence of dental caries and periodontal disease was estimated to deduce the sample size.

Sample size was calculated with 95% confidence interval and 5% absolute error. The formula $N= 4pq/L^2$ was used for the sample size calculation. Where p is prevalence and q= (1-p) L= allowable error.

N= 4 * 0.42 (1-0.42)/ 0.05*0.05 = 390

In the pilot study done, the prevalence was 0.42 (prevalence of the dental caries). The sample size was estimated as 390. In order to cover for the non-respondents a total of 420 subjects were examined during the study. Single examiner was used for data collection. Intra-examiner consistency was assessed based on the percentage of agreement between scores of different oral health indices and was found to be 86-98%.

Institutional ethical clearance and permission from concerned authorities were obtained before the start of the study. The study was carried from February 2014 to April 2014. The modified WHO oral health assessment form (1997) was used [9]. Dental caries, periodontal disease, oral mucosal lesions, prosthetic status and needs etc., were assessed.

Socio-demographic characteristics like occupation, geographic location, type of household, monthly expenditure, education, dietary habit, the source of drinking water and oral hygiene practise methods were recorded.

Demographic Variables		N	%
Age group	35-44 years	255	60.7
	65-74 years	165	39.3
Gender	Male	228	54.3
	Female	192	45.7
Occupation	Labourers	252	60
	Others	168	40
Education level	Illiterate	295	70.2
	Up to primary school	91	21.7
	High school and above	34	8.1
Geographical location	Urban	07	1.1
	Rural	413	98.3
Types of house hold	Thatched	91	21.7
	Kuccha	100	23.8
	Pucca	229	54.5
Monthly expenditure	<2500	177	42.1
	2501-5500	146	34.8
Dietary habit	Don't know Vegetarian	51	12.1
	Non-vegetarian	369	87.9

[Table/Fig-1b]: Distribution of subjects by socio-demographic characteristics.

SPSS version 17 was used for statistical analysis. Bivariate analysis was done using Chi square test to assess the association between categorical variables. The level of significance was set at 5%.

RESULTS

The socio-demographic characteristics are shown in [Table/Fig-1b] and information about oral hygiene practice methods is shown in [Table/Fig-2]. More than half (55.47%) of the respondents used brush to clean their teeth. Information about various deleterious habits is show in [Table/Fig-3]. Ulceration, sores, erosions, fissures in commissures was observed in seven (1.66%) female subjects, whereas 4.52% of subjects were having TMJ disorders. The prevalence of oral mucosal lesions among the Paniya population was 4.52%. The distribution of subjects according to age and CPI score is shown in [Table/Fig-4]. Bleeding on probing was elicited in 32.4%. Bivariate analyses between the index age groups and CPI scores using Chi-square test showed high statistical significance (p=0.001).

The distribution of study subjects by mean sextant CPI score according to age group is shown in [Table/Fig-5] and distribution of study subjects according to age and loss of attachment is shown in [Table/Fig-6]. In the 35-44 age group 80.4% had loss of attachment 0mm-3mm. Distribution of study subjects according to age and loss of attachment showed statistical significance (p=0.001). Dental caries distribution with respect to age is shown in [Table/Fig-7]. The prevalence of caries was 39.7%. Bivariate analyses of DMFT scores with age groups was found to be highly significant (p=0.001).

The treatment requirements of the subjects are shown in [Table/Fig-8]. Bivariate analyses between age groups and prosthetic need in the upper arch is highly significant statistically (p=0.001). The need for prosthesis was less in females (40.2%) as compared to males (59.8%) in the upper arch. Bivariate analysis between gender and prosthetic need for upper arch was highly significant (p=0.001). Need for one unit prosthesis was almost double in 35-44 age group (67.3%) compared to 65-74 age groups (32.6%). Bivariate analyses between gender and prosthetic need for lower arch showed statistically high significance (p=0.001). The need for emergency care was observed in 3.57% of the subjects examined.

Oral hygiene practice methods		Male		Female		Total	
		N	%	N	%	N	%
Method used for cleaning tooth	Finger	63	15	55	13.09	118	28.09
	Brush	120	28.57	113	26.9	233	55.47
	Datun	18	4.28	05	1.19	23	5.47
	Others	04	.95	00	00	04	0.95
	Not applicable*	23	5.47	19	4.5	42	10
Frequency of cleaning tooth	Once in a day	112	26.6	107	25.4	219	52.14
	Twice a day	65	15.47	52	12.38	117	27.8
	After every meal	18	4.28	14	3.3	32	7.61
	Not applicable*	33	7.8	19	4.5	52	12.3
Material used for cleaning the tooth	Tooth paste	72	17.4	91	21.66	163	38.80
	Tooth powder	54	12.8	04	.95	58	13.80
	Rice husk	23	5.4	19	4.52	42	10
	Others	52	12.3	58	13.8	110	26.1
	Not applicable*	27	6.4	20	4.7	47	11.1
Change of tooth brush	Once every three months	46	10.9	93	22.4	139	33.09
	Once every six months	79	18.8	20	4.76	99	23.5
	Once in a year or longer	06	1.42	00	00	06	1.42
	Not applicable*	09	23	79	18.8	176	41.9
Reported preventive measures	Not Consuming tobacco	16	3.8	05	1.19	21	05
	Cleaning tooth regularly	12	2.8	00	00	12	2.8
	Visiting dentist regularly	06	1.42	00	00	06	1.42
	Do not know	194	46.1	187	44.5	381	90.71

[Table/Fig-2]: Oral hygiene practice methods.
• Not applicable – denture wearers

DISCUSSION

The comparison of the present study with other studies is difficult due to differences in the population type, selected age group and period during which studies were conducted. Statistics clearly show that despite government initiatives, the existing socio-economic profile of the Paniya community is low compared to the mainstream population. The celebrated Kerala model of development has not made much change in the life of Paniyas [5]. Majority of the subjects interviewed were reported to be contract workers. This observation about their occupation is consistent with experiences shared by Vasudevan S [4]. It has been observed that occupations of the Paniyas were controlled by mainland people and hence, most of them work on contract jobs [11].

Surveys done in many parts of the world have found tooth brushing to be the best way to maintain oral health [12]. The Bhils, a tribal population of Rajasthan clean their teeth only with mouthful of water [2]. Iringa tribal population uses chew stick to clean their mouth [6]. In contrast, the present study showed that 55.5% used brush and 52.2% brushed daily once.

Habit of chewing paan or paan masala with tobacco was reported to be 9% in the National Health Survey conducted in 2002-2003 [13]. In contrast the Paniya population resorted to indiscriminate use (89.3%) of paan masala. In the present study extra oral lesions were seen in 3.6% of the subjects. The national oral health survey conducted in 2002-2003 reported a lower prevalence in the country with only 1.1% subjects being affected in children aged 5 years and a maximum of 2.8% being affected in the highest age group of 65-74 years [13].

The prevalence of leukoplakia in the present study was 1.90%. A study conducted by Ramdas et al., in Thiruvananthapuram district, Kerala showed a premalignant case detection rate of 2.5% [14].

Personal Deleterious Habits		Gender				Total	
		Male		Female			
		N	%	N	%	N	%
Smoking habits	Yes	103	90.3	11	9.7	114	27.2
	No	136	44.4	170	55.6	306	72.8
Nature of smoking	Hookah	01	0.4	0	0	01	0.2
	Cigarettes	96	40.2	11	6.1	107	25.5
	Bidis	06	2.5	0	0	06	1.4
	Non consumers	136	56.9	170	93.9	306	72.8
Number of smoking in a day	<10 times	86	36.00	11	6.10	97	23.10
	10-20 times	17	7.1	0	0	17	4.1
	Non consumers	136	56.9	170	93.9	306	72.8
Chewing paan masala habits	Yes	200	87.7	175	91.1	375	89.3
	No	28	12.3	17	8.9	45	10.7
Number of years of chewing pan or pan masala with tobacco	Less than 5 years	52	23.6	23	12.0	75	18.8
	5-10 years	112	49.1	103	53.6	215	51.2
	>10 years	32	14.0	49	25.5	81	19.3
	Non consumers	28	12.3	17	8.9	45	10.7
Number of times chewing tobacco in a day	less than 5 times	114	50.0	46	24.0	160	37.0
	5-10 times	87	38.2	123	67.2	210	52.7
	>10 times	05	2.2	00	00	05	1.1
	Non consumers	25	9.6	20	8.8	45	9.2
Reported preventive measures	Yes	98	84.4	18	15.5	116	27.6
	No	130	42.7	174	57.3	304	72.4
	Daily	07	3.1	00	00	07	1.7
Frequency of alcohol habits	Three times a week	31	13.6	14	7.3	45	10.7
	Occasionally	60	26.3	04	2.1	64	15.2
	Non consumers	130	57.0	174	90.6	304	72.4

[Table/Fig-3]: Information about various deleterious habits.

Distribution of subjects by highest CPI score		Age group		Total	p-value
		35-44 years	65-74 years		
Healthy	n	95	02	97	0.001
	%	37.3	1.2	23.1	
Bleeding	n	93	43	136	
	%	36.5	26.1	32.4	
Calculus	n	38	31	69	
	%	14.9	18.8	16.4	
Pocket 4-5mm	n	29	23	52	
	%	11.4	13.9	12.4	
Pocket 5mm and above	n	00	01	01	
	%	00	0.6%	0.2	
Not recorded	n	00	65	65	
	%	00	39.4	15.5	

[Table/Fig-4]: Distribution of subjects according to age and CPI score.

Prevalence of periodontal disease among the adult Paniya population was found to be 76.9% and these findings are not in agreement with the studies done in Bhil tribes of Rajasthan and the Irigula tribe [2,6]. The prevalence of pockets was 12.6% whereas Iruligas of Karnataka and the adult Australian aborigines in Western Australia were having higher prevalence [15]. In the present study,

Age group		Healthy	Bleeding	Calculus	Pocket 4-5mm	Pocket 5mm or above	Excluded sextant
35-44 years	Mean	1.53	1.28	2.30	0.58	0.29	0.02
	S.D	1.87	1.63	2.49	1.01	0.90	0.14
65-74 years	Mean	0.32	0.66	2.55	0.81	0.47	0.91
	S. D	0.58	1.12	1.93	1.00	0.92	1.64

[Table/Fig-5]: Mean sextant CPI Score among subjects according to age.

Loss of attachment		Age group		Total	p-value
		35-44 years	65-74 years		
0-3mm	n	205	57	262	0.001
	%	80.4	34.5	62.4	
4-5mm	n	36	7	43	
	%	14.1	4.2	10.2	
6-8mm	n	9	14	23	
	%	3.5	8.5	5.5	
9-11mm	n	01	19	20	
	%	0.4	11.5	4.8	
12mm	n	04	01	05	
	%	1.6	0.6	1.2	
Excluded sextant	n	00	67	67	
	%	00	40.6	16.0	

[Table/Fig-6]: Distribution of study subjects according to age and loss of attachment.

Age group	Subjects with caries		Subjects with no caries		Subjects with DMFT 4 or more	
	n	%	n	%	n	%
35-44 years	75	17.85	150	35.71	38	9.04
65-74 years	92	21.90	103	24.52	118	28.09

[Table/Fig-7]: Distribution of subjects according to age and dental caries.

the prevalence of loss of attachment of 4mm - 5mm was 14.1% for the 35-44 years age group. This finding is much lower than in the Iruliga tribes [6]. Also in the Indian National Oral Health Survey this prevalence in 35-44 years age group was 41.2% and in 65-74 years age group it was 60.7% [13].

The caries prevalence assessed using DMFT index in the study population was 39.75%. Across the age groups it was 1.52 ± 1.95 among 35-44 year olds and 18.47±13.10 among the 65-74 year old age group. When compared to the Kerala state averages, the DMFT value was lower in the 35-44 year age group and higher in the 65-74 year age group which were 5.1 and 11 respectively [13]. The mean DMFT of 1.52 ±1.95 in the present study according to WHO criteria can be considered as very low in the 35-44 year age group when compared with same age groups with dental caries levels worldwide. Similar trends are observed in ethnic minority groups of Anangu Pitjantjatjara lands [16], Australia and South Thames region [17] of the UK. In sharp contrast, the indigenous population of Gautamela showed high levels of caries with a mean DMFT of 10.2 [18].

Edentulism in Paniyas (15.48%) is less than the previous reported rates of 67.4% and 48.6% among the Turkish and Singaporean subjects [19,20]. Oral health care access and affordability is limited in developing economies and also they have high prevalence of dental caries and periodontal disease as compared to developed

Age in years	One surface filling		Two or more surface filling		Crown		Veneer or laminate		Pulp care and restorations		Extraction		Need for other care	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
35-44 years	22	8.6	09	3.5	04	1.56	4	1.56	04	1.56	18	07	44	17.25
65-74 years	29	17.5	19	11.51	04	1.56	04	1.56	04	1.56	34	20	46	27.8

[Table/Fig-8]: Distribution of subjects according to age and treatment requirements.

countries [21,22]. However earlier study has reported that the perceived severity, perceived importance, perceived benefits for oral health needs among Paniyas are high, but there are less perceived barriers which may help in acceptance of the oral health services among them [7].

LIMITATION

The study did not assess the oral health care availability and accessibility in their regions is one of the limitations of the study since this information could have been associated with high prevalence of the oral diseases.

CONCLUSION

The oral disease burden is very high in Paniya tribes. The prevalence of the tobacco habits is of concern. This data is useful in bringing awareness about the oral health problem in these unreached communities and can be used for planning for oral health promotion.

RECOMMENDATION

There is urgent need for well-organized oral health care delivery system. Greater emphasis on oral health care and health care policies to include oral health care as an integral part of primary health care is the need of the hour. Tobacco control and curbing the habit of alcoholism need to be addressed. Strategies should be designed with an understanding of the pattern of use and the socio-cultural realities of the community.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **May 20, 2016**
Date of Peer Review: **May 26, 2016**
Date of Acceptance: **May 30, 2016**
Date of Publishing: **Oct 01, 2016**