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Periodontal health status and treatment needs among building construction workers in Chennai, India

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Abstract:
Objectives: Periodontal disease is universally prevalent and an important public health problem. Poor life style and negative psychosocial condition has been said to play an important role in the aetiology of adult periodontitis. Construction workers are characterized by insecurity of wages and poor life style. Dental extractions form a major constituent of therapeutic measures in these lower socio economic populations, hence an attempt has been made to assess the periodontal health status and treatment needs among them.
Methods: A cross sectional study, involving 321 construction workers using a cluster sampling technique was employed and the study was conducted in four construction companies selected by simple random sampling. Data were entered in Microsoft Excel spread sheet and analyzed using Statical package of social science software. Pearson's chi square and Kruskal Wallis test were used for statistical analysis.
Results: The prevalence of periodontal disease among the study subjects was 95.4%. Bleeding and calculus was most frequently observed in the age groups 20 -29 years, whereas the percentage of individuals with shallow and deep pockets was greater in the age groups 35-54 years. Among the study subjects 53.6% required scaling 23.4% required oral hygiene instructions, 18.7% required complex periodontal treatment.

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Conclusion: The present study reveals that the periodontal health status of construction workers in Chennai vindicates vast improvement
Keywords: Health planning, periodontal disease/epidemiology.

Introduction:

Ever since the days of Hippocrates periodontal disease has crippled the survival of human dentition. It is one of the most widespread chronic diseases in the world. Although the critical role of dental plaque in the etiology of periodontal disease is well established, it does not explain the differences in susceptibility of a given population.

Periodontal disease is one of the important public health problems. Its impact on an individual's quality of life reflects complex social norms and cultural values and traditions. The association between oral health status and daily performances in a Thai population showed that 74% of 35-44 year old had daily performances affected by their oral health status[1]. Personal risk factors such as poor life style and negative psychosocial conditions has been said to play an important role in the etiology of adult periodontitis and this was proved in a study conducted in a remote Canadian community[2].

Studies about the socio-economic perspective on periodontal diseases showed that the socio-economic variables associated with periodontal diseases appear to be of less importance than smoking[3]. Access to dental care is an important factor in determining the outcome of the disease. A positive relationship was found between the access to subsidized dental care and periodontal status in male industrial workers in southern Finland[4].

Construction industry is an important constituent of every aspect in the economy .It is the second largest employer after agriculture. It employs about 18 million people directly or indirectly and has been growing over 10% per year over the last five years[5]. Construction workers are characterized by insecurity of wages, dangerous working conditions and lack of access to any kind of health care. According to a recent survey by the International Labour Organization, 165 out of every 1000 workers are injured during the work[6].

The living conditions are no way better than the working conditions. They live in temporary shelters built on the construction site, in tents built out of rubber and metal sheets. Most of the time the construction companies do not provide any electricity or proper sanitation. Dental extractions form a major constituent of therapeutic measures owing to dental caries and periodontal status in these lower socio economic populations[3]. Chennai being the busiest metro with its bustling construction activity entertains majority of the influx of the migrant workers and local workers[6]. There are only few studies which have focussed on the periodontal health status and treatment needs in the construction workers. Therefore the aim of the current study was to assess the periodontal health status and treatment needs among the construction workers and the objectives were to assess the socio economic status and Oro dental problems of the study population.

Materials and Methods:

A cross sectional study was carried out on the construction workers in Chennai, one of the four metropolises of India, the capital of Tamilnadu. The city's economy largely depends upon trade and industry. The construction industry constitutes the core sectors of economy with a gross value output of almost 7,061 billion in the years 2008-09. As per the Builders Association of India the number of registered builders in Chennai was 297[5]. Among the 11, 92, 924 workers in Chennai 6.3% are construction workers. The study population consisted of 264 males and 57 females.

All those who were present during the time of study were included in the study. Subjects who suffered from systemic illness and those who were not willing to participate were excluded from the study. Ethical approval was obtained from the Institutional Review Board of Saveetha University. Written Informed consent was obtained from all the participants.

Table 1: Distribution of study subjects according to age and periodontal health status

Age(years)	Individual Health Status											
	Healthy		Bleeding		Calculus		Shallow pocket		Deep pocket		Total	
	n	%	n	%	n	%	n	%	n	%	N	%
< 19	7	16.3	15	34.9	21	48.8	0	0	0	0	43	13.4
20-24	5	5.5	31	34.1	53	58.2	1	1.1	1	1.1	91	28.3
25-29	1	1.6	22	36.1	38	62.3	0	0	0	0	61	19
30-34	1	2.5	4	10	30	75	3	7.5	2	5	40	12.5
35-44	0	0	2	3.1	26	40.6	30	46.9	6	9.4	64	19.9
45-54	0	0	1	4.5	4	18.2	15	68.2	2	9.1	22	6.9
Total	14	4.4	75	23.4	172	53.6	49	15.2	11	3.4	321	100

2 = 185.72, df = 20, p = 0.000, Highly Significant

Table 2: Distribution of study subjects according to age and treatment needs.

Age(yr)	Individual Treatment Needs									
	TN 0		TN 1		TN 2		TN 3		Total	
	N	%	n	%	N	%	n	%	N	%
< 19	7	16.3	15	34.9	21	48.8	0	0	43	13.4
20-24	5	5.5	31	34.1	53	58.2	2	2.2	91	28.3
25-29	1	1.6	22	36.1	38	62.3	0	0	61	19
30-34	1	2.5	4	10	30	75	5	12.5	40	12.5
35-44	0	0	2	3.1	26	40.6	36	56.3	64	19.9
45-54	0	0	1	4.5	4	18.2	17	77.3	22	6.9
Total	14	4.4	75	23.4	172	53.5	60	18.7	321	100

2 = 182.288, df = 15, p = 0.00, Highly significant

Table 3: Mean number of sextants according to age and periodontal condition

CPITN scores	Age (Yrs)					
	< 19	20-24	25-29	30-34	35-44	45-54
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Healthy	1.4±2.4	0.6±1.5	0.7±1.7	0.3±1	0	0.1±0.4
Bleeding	3.2±2.4	3.3±2.4	3.3±2.3	2.4±2.3	1.4±1.6	1±1.5
Calculus	1.4±2	2.1±2.3	2±2.2	2.9±2.3	3.3±1.7	3±1.5
Shallow pocket	0	0	0	0.3±0.8	1.2±1.3	1.8±1.3
Deep pocket	0	0	0	0.1±0.2	0.1±0.4	0.1±0.3

P=0.000 Highly Significant

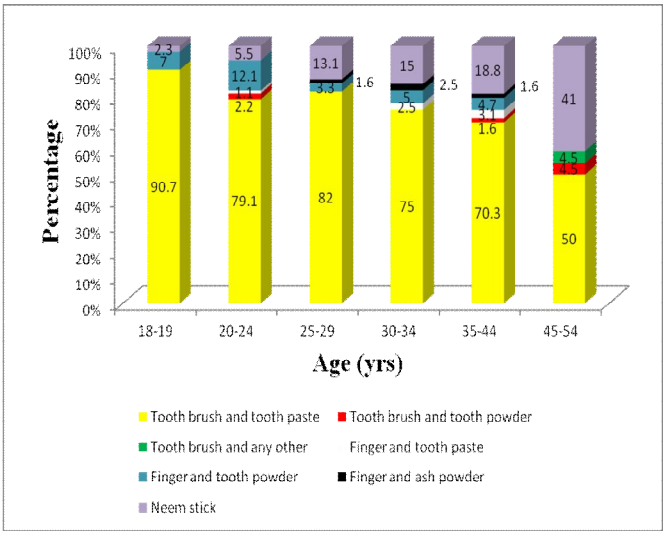

Figure 1: Distribution of study subjects according to mode and materials used for cleaning the teeth

The sample size was 206, calculated based on the prevalence (P) of periodontal disease (65%) from the pilot study. As cluster sampling technique was employed, final sample size was 288 subject [206 X 1.4 (design effect)]. A list of construction companies in Chennai were obtained from 'The Builders Association of India'. Four construction companies were selected from the above mentioned list by simple random sampling method. Eligible workers in all the construction sites under those selected companies were enrolled in the study, yielding a total sample of 321 individuals.

A pretested interviewer administered questionnaire and a Dentition Status and Treatment Needs Index recording form were used. The questionnaire was designed to elicit information on demography, socio economic status, oral hygiene practices. Assessment of socio economic status is an important aspect in community based studies. Socio economic status was assessed using Pareek's scale[7].

Clinical examination was conducted by a single examiner who had been trained through a series of clinical training sessions at the Department of Public Health Dentistry, Saveetha Dental College, Chennai. The intra examiner reliability was (K=0.71). After recording the questionnaire, dental examinations were conducted in supine position under natural light by means of a mouth mirror and a CPI probe which conform to World Health Organization (WHO) specifications.

Instruments used were sterilized using standard protocol. Only completely filled forms were considered for analysis.

Data were entered in Microsoft Excel spreadsheet and analyzed using SPSS software (version15). Pearson's chi-square and Kruskal Wallis test were used to test the differences for various parameters between different age groups, occupation and socio economic status. For all the tests, a p value of < 0.05 was considered to be statistically significant.

Results:

The study sample consisted of 321 construction workers, 264 (82.2%) were males and only 57(17.8%) were females. The study subjects were ranging from ages 18 – 54 yrs. Socio economic status and level of literacy were assessed using Pareek's scale and it was found that majority of them 166(51.7%) were below poverty line, 146(45.5%) were lower class and only 9(2.8%) belonged to the lower middle class. Among the study subjects 105(32.7%) were illiterate, 131(41%) had education up to fifth standard, 53(16.5%) had education up to seventh standard, 25(7.8%) had completed their tenth standard, 7.7(2.1%) were intermediates. The association between socio economic status and level of literacy was found to be statistically highly significant.

Among the study population about 94.4% brushed their teeth once daily and only 5.6% brushed twice daily. Figure 1 depicts the distribution of study subjects according to the modes and materials used for cleaning the teeth. The usage of tooth brush and tooth paste was high among the 18-19 years age group and the usage of neem (Azadirachta indica) stick was high among the 45-54 years age group. The periodontal health status and treatment needs were assessed using CPITN index. Table 1 depicts the distribution of study subjects according to age and periodontal health status. The prevalence of periodontal disease increased as the age advances and this relationship was found to be statistically highly significant. In all age groups majority of them had periodontal problems, in particular there was not even a single person with healthy periodontium in the 35-44 and 45 – 54 years age group.

Table 2 depicts the distribution of study subjects according to treatment needs. Among the study subjects 14 (4.4%) had healthy periodontium, 75 (23.4%) needed oral hygiene instruction, 172 (53.5%) needed scaling and oral hygiene instruction, 60 (18.7%) needed complex periodontal therapy along with scaling and oral hygiene instruction. It was found that as the age increases more complex periodontal treatment was required in the study population. The relationship between age and treatment needs was found to be statistically highly significant. Table 3 depicts the mean number of sextants affected based on the age and periodontal status Kruskal Wallis test was performed to test the association between age and periodontal health condition among the study subjects, it was found to be statistically significant both within the age groups and between the age groups.

Discussion:

In this study an attempt was made to assess the periodontal health status using community periodontal index and treatment needs among the construction workers in Chennai. The majority of the population belonged to the lower socio economic class with poor educational status. Socio economic status is an important risk indicator of periodontal disease. A MEDLINE search including 47 studies indicated that 29 out of the 36 studies were in favour of the association between socio economic factors and periodontal disease[3].

In India, there is no national oral health care service as in other developed countries, although the government provides formal medical care in the form of primary health centres and community health centres. There is no provision for dental care; thus the study population has poor access to oral health care services. About 78.5% of the subjects stated that they had never been to a dentist due to high costs involved in the treatment.

The findings of this study showed that 247(76.9%) of the construction workers who participated in the study used tooth brush and tooth paste for cleaning the teeth and 18 (5.6%) brushed

their teeth twice daily. This was unlike the findings of the study conducted on green marble mine workers. This could be a reason for the higher prevalence of periodontal disease (98.2%) and gingival bleeding (45.6%) in particular in the marble mine workers[8] against 95.4% and 23.4% in the current study.

Bleeding and calculus were widespread among all age groups. Similar results were observed in a group of mine workers in Rajasthan[8]. Calculus was the most frequently observed periodontal condition in the age groups 20-24 and 25 -29 years, whereas the percentage of individuals with shallow and deep pockets was greater in the age groups 35-44 and 45 -54 years. The prevalence and severity of periodontal disease increased with increasing age and this relationship was found to be statistically highly significant in the present study.

In this study the prevalence of pathological pockets in 45 -54year old adults was higher (68.2%) when compared to 39.86% in German factory workers[9]. This difference could be attributed to the increased chances of exposure to cement dust by the construction workers[10]. The prevalence of pathological pocket in the 35-44 year age group (9.4%), in the current study showed only a marginal increase when compared to the results of the study in a Brazilian worker group[11].

Among the 321 study subjects, 53.5% required scaling along with oral hygiene instructions, 23.4% required oral hygiene instructions, 18.7% required complex periodontal treatment This was similar to the results observed by Roman A et al in the factory worker group[12.] In the current study only 4.4% of the subjects had a healthy periodontium, whereas in a study by Ahlberg et al in 1996, 6% of the subjects had healthy periodontium. This could be due to the availability of subsidized dental care in that population[4].

There is a growing body of evidence which suggests smoking and periodontal disease are closely related and it is one of the most significant factors in the development of periodontal disease. The first limitation in the current study was that the association between smoking and periodontal health was not studied. The second limitation being, the male: female ratio was unequal; hence comparison between the gender was not possible. Majority of the study population was casual labourers (60%), hence comparison between different occupations was not possible. The present study highlights the fact that the prevalence of periodontal disease among the construction workers in Chennai is high.

It is recommended that dental health education should be provided in the community focusing on the importance of maintaining oral hygiene, regular visits to a dentist, replacing missing teeth, tobacco cessation. In conclusion a comprehensive understanding of the magnitude of the public health problem would enable effective planning of intervention measures.

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