Oral Health Status and Oral Impact of Daily Life Among Permanent Residents in Thiruvallur District

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Abstract---Introduction: Oral diseases like dental caries, periodontal diseases, oral cancers, oral manifestations of HIV, oro-dental trauma, cleft lip and palate, though not life threatening constitute major public health problems worldwide. The Global burden of Disease Study 2017, estimated that oral diseases affect close to 3.5 billion people worldwide. Therefore, the aim of this study is to assess the oral health status, unmet oral health needs and oral impact of daily life among the permanent residents in Tiruvallur district. Materials and Methods: The WHO Oral health assessment form (2013) was used to record the oral health status. For assessing the quality of well-being among the patients, the Oral Impact on Daily Performances questionnaire was

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used (Sheiham A et al). After a brief introduction on the purpose and intent of the study, examination was conducted by a single examiner. Demographic information like age, gender, education, occupation were recorded. The oral health status was recorded after clinical examination of the oral cavity followed by Oral Impact on Daily Performance questionnaire. Descriptive statistics, chi square test were used. Mann Whitney U test was used to test the association between gender and OIDP scores. Kruskal Wallis test was used to test the association between the age groups, SES and OIDP domains. Results: The mean DMFT of the study participants was 5.77±6.14. The gingival status was recorded among the participants was found to be statistically significant when compared among the age groups According to the intervention urgency, majority of the population (46.8%) needed prompt treatment. There was a statistically significant association between location, education, occupation, SES and reasons for unmet dental treatment needs. Kruskal Wallis test was used to test the association between the all the OIDP domains and socioeconomic classes. Conclusion: The findings of the study conclude the oral health status of the study population was poor as dental caries, gingival diseases were found to be prevalent among the population. Poor oral health status was related to factors like age groups, gender, and socioeconomic status.

Keywords---oral health, impact profile, unmet needs, socioeconomic status, urban rural.

Introduction

Oral health is a fundamental component of health, physical and mental well-being, influenced by values and attitudes of individuals and the surrounding communities. According to FDI, oral health is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, and swallow without pain, discomfort and diseases of craniofacial complex[1]. A good oral health influenced by an individual's changing perceptions, expectations towards their oral cavity reflects the physiological, social and psychological attributes which are essential to a better quality of life.

Oral diseases like dental caries, periodontal diseases, oral cancers, oral manifestations of HIV, oro-dental trauma, cleft lip and palate, though not life threatening constitute major public health problems worldwide[2]. The Global burden of Disease Study 2017, estimated that oral diseases affect close to 3.5 billion people worldwide[3]. The National Oral Health Survey of India revealed high prevalence of oral diseases especially dental caries and periodontal diseases among all age groups, with about 90% adults having poor periodontal health and decay[4]. India, being a developing country still suffers from the burden of oral diseases, particularly the underprivileged section of the population. Pain and a reduced oral health quality of life are the most common effects of bad oral health. Various aspects of quality of life, such as physical and social functioning, are affected. In developing nations, the transition to this holistic philosophy of health

occurred in the twentieth century, and Oral Health Related Quality of Life (OHRQOL) became a "silent movement"[5]

Researchers have broadened their focus on the patho physiological assessment of clinical disease to incorporate a more holistic view of health thus improving the quality of life. There has been an increase in the motivation for measuring negative as well as positive changes in oral health status. The development of socio-dental indicators is a more comprehensive approach to supplement clinical indicators. The socio dental indicators are developed from the basic framework of role function. Previously, studies have reported significant association between dental caries and quality of life[6–9]. Malocclusion has also been known to have negative impact on social aspect of life and is associated with negative physiological conditions as well[10] and similar results have been reported in various studies[11–13]. Similarly, periodontitis which is the second most common oral health diseases affecting 10-15% of the world population[14] also has shown positive association between aggravating conditions and poor quality of life[15–17]

However, the perception towards oral health is poor among the Indian population as dental problems affect morbidity more than mortality[18] and also the attention towards promotion of oral health by the government is limited. Diversities in wealth, culture, and social status are reflected as inequalities in health especially in those who belong to low income strata. Barriers in achieving dental treatment can be due to geographical situations, unequal dentist to population ratio, where health services lack drastically in rural population as the ratio lies at 1:150,000[19]. Also patients are not covered under any kind of insurance by the health ministry, which leads to increased out of pocket expenditure eventually causing increased risk of poverty and reduced welfare[20]. Therefore, the aim of this study is to assess the oral health status and oral impact of daily life among the permanent residents in Tiruvallur district.

Materials and Method

Study design

To address the stated research questions, a cross sectional questionnaire community based study was conducted.

Study area

Tiruvallur district

Sampling procedure

Systematic random sampling was carried out by selecting every second person who came for attending the camps in conducted.

Inclusion criteria

- Individuals 18 and above years of age.
- Individuals who are willing to participate in the study.

Exclusion criteria

- Participants under long term medications which affects the oral health.
- Individuals not willing to participate in the study
- Individuals who are not permanent residents of Tiruvallur district.

Ethical clearance

Prior to start of the study, ethical clearance was obtained from the Scientific Review Board, Saveetha Dental College. The study participants were given clear explanations about the objective of the study. Written consent was obtained from the participants. Anonymity of the participants was maintained.

Scheduling

Data collection was scheduled from the month of November, 2019 and onwards.

Sample size calculation

Sample size was calculated based on the study by Arthi Veraswamy et al; 2016, using the formula: $Z\alpha^2 PQ/L^2$ which was found to be 977

Survey instrument

The WHO Oral health assessment form (2013) was used to record the oral health status. For assessing the quality of well-being among the patients, the Oral Impact on Daily Performances questionnaire was used (Sheiham A et al)

Survey Methodology

After a brief introduction on the purpose and intent of the study, examination was conducted by a single examiner. Demographic information like age, gender, education, occupation were recorded. The oral health status was recorded after clinical examination of the oral cavity followed by Oral Impact on Daily Performance questionnaire.

Statistical analysis

Data was entered in Microsoft excel spreadsheet and analyzed using SPSS Version 23.0. Descriptive statistics, chi square test were used. Mann Whitney U test was used to test the association between gender and OIDP scores. Kruskal Wallis test was used to test the association between the age groups, SES and OIDP domains. Dunn post-hoc test was used to determine which groups differ from each other group.

Results

A total of 1008 participants were included in the study. The participants were categorized into five age groups as presented in Graph 1. Majority of the participants were found to be in the age group of 18-34 years age group. There

was almost equal representation of both the genders (51.5% females & 48.5% males). The demographic data has been recorded and presented in detail in Table 1. The mean DMFT of the study participants was 5.77±6.14. The gingival status was recorded among the participants was found to be statistically significant when compared among the age groups (Graph 2). Enamel fracture was observed among 13.9% of the population (Figure 1). According to the intervention urgency, majority of the population (46.8%) needed prompt treatment (Graph 3). There was a statistically significant association between location, education, occupation, SES and reasons for unmet dental treatment needs were (Table 2). Table 3 shows the association between gender and frequency of oral impact for daily performances. The association between gender and severity of oral impact for daily performances is shown in Table 4. Kruskal Wallis test was used to test the association between the all the OIDP domains and socioeconomic classes (Table 5, 6).

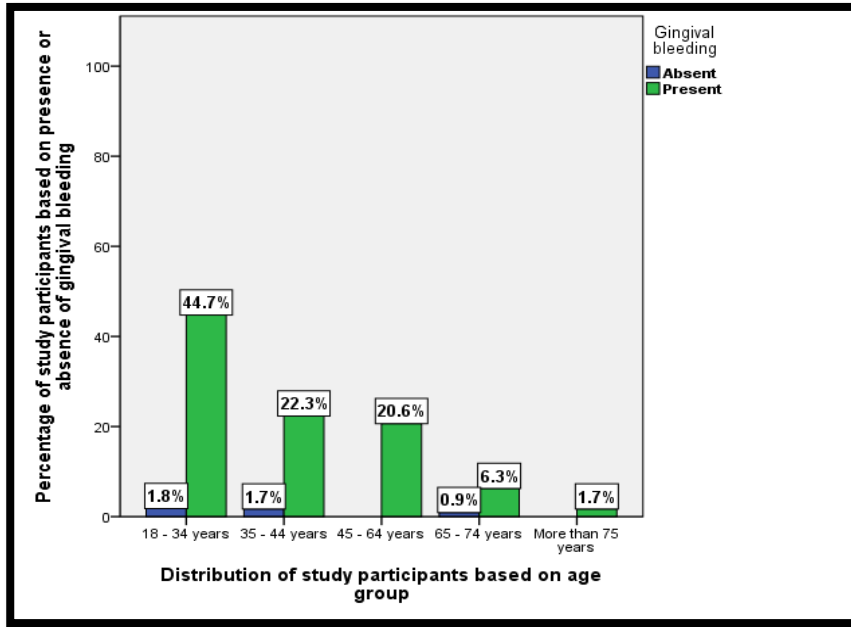Graph 1: Distribution of the study participants based on age groups
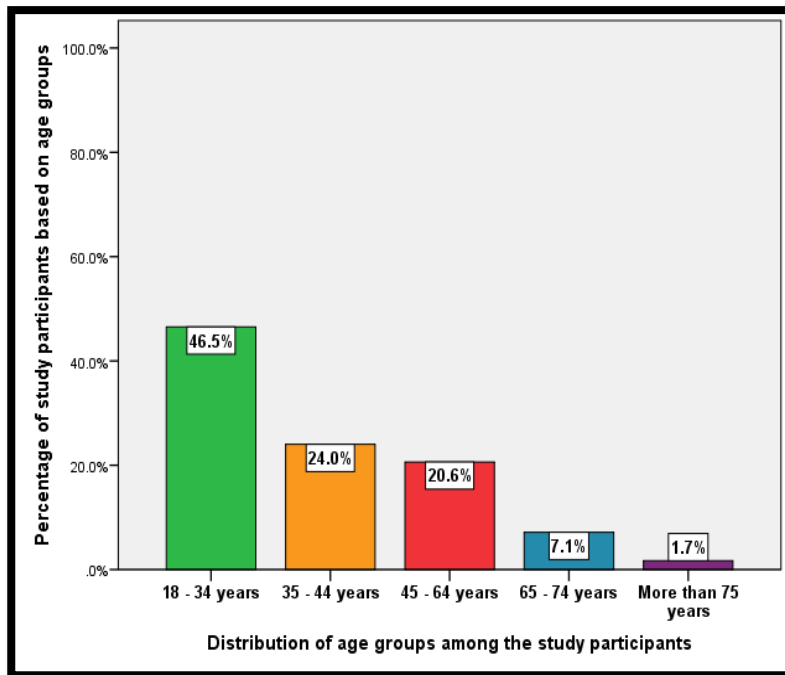
Graph 1: The bar graph represents the distribution of study participants based on age groups. It can be interpreted from the graph that majority of the participants (46.5%) belonged to 18- 34 years age group (denoted by green), followed by 24.0% in 35-44 years (denoted by orange).

Table 1

Distribution of study participants based on demographic data

Variables	N(%)
Location:	
Peri-urban	280(27.8)
Rural	728(72.2)
Education:	
Graduate or Postgraduate	147(14.6)
Intermediate or Post High school diploma	221(21.9)
High school	76(7.5)
Middle school	259(25.7)
Primary school	172(17.1)
Illiterate	133(13.2)
Occupation:	
Professional	45 (4.5)
Semi professional	23(2.3)
Clerical, shop owner/farm	102(10.1)
Skilled worker	224(22.2)
Semi-skilled worker	252(25.0)
Unskilled worker	72(7.1)
Unemployed	290(28.1)
Socioeconomic status:	
Upper	18(1.8)
Upper middle	55(5.5)
Lower middle	311(30.9)
Upper lower	611(60.6)
Lower	13(1.3)
Marital status:	
Unmarried	268(26.5)
Married	740(73.4)

Table 1 represents the distribution of the study participants based on their demographic data. Based on the findings of the study, majority of the study participants belonged to rural population (72.2%), middle school pass outs (25.7%). About 28% of the study participants were unemployed. Majority belonged to upper lower social class (60.6%) and most of the study participants were married (73.4%).

Graph 2: Association between gingival bleeding and age group among study population

Graph 2 represents the distribution of the age groups and gingival status of the study participants. Chi square value: 26.07; df: 4; p value: 0.001. The association between age group and gingival status was found to be statistically significant.

Figure 3. Distribution of study participants based on prevalence of dental trauma
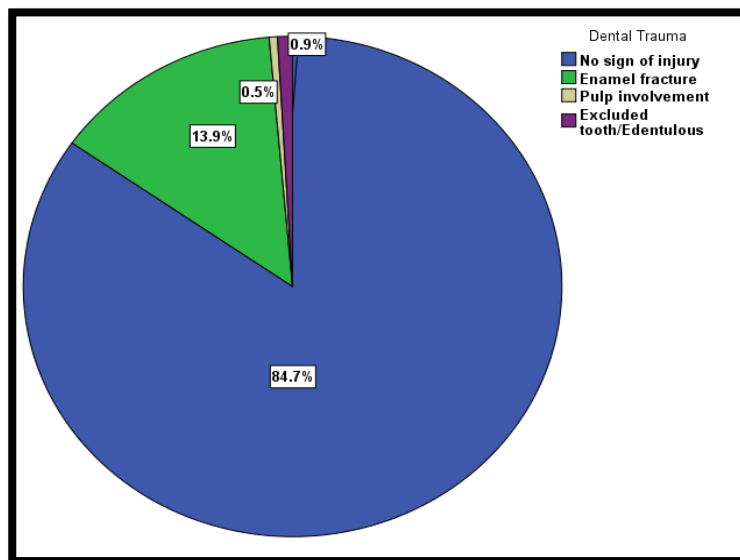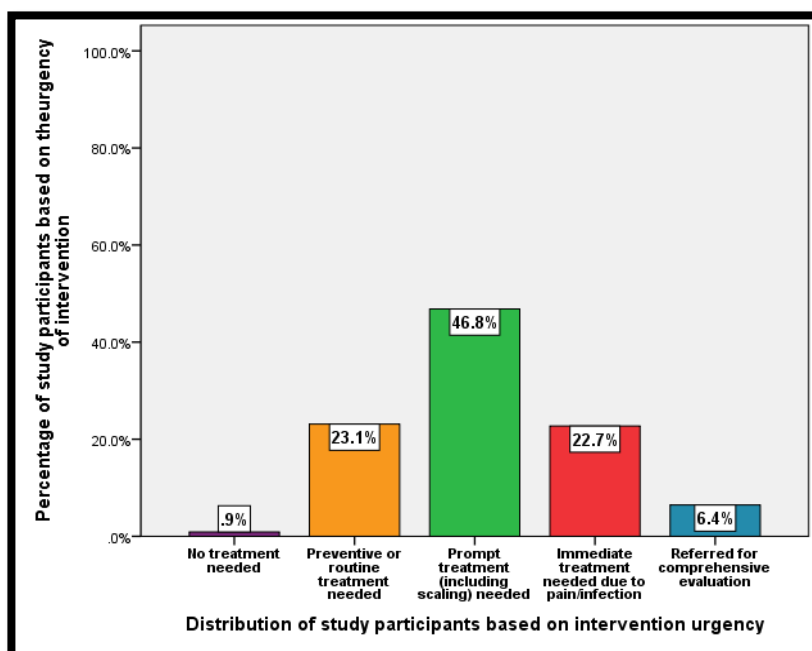
Figure 3: The pie chart represents the severity of dental trauma observed among the study participants. Among the study participants, 13.9% had enamel fracture (denoted by green).

Graph 3: Distribution of study participants based on the urgency of intervention

Graph 3 represents the intervention urgency among the study participants. Based on the findings, majority of the participants (46.8%) were in need of prompt treatment (denoted by green).

Table 2
Distribution of the study participants based on their location, education, occupation, socioeconomic status and reasons for unmet dental treatment needs

Variables	Could not afford the cost N(%)	Did not want to pay for the cost N(%)	Fear/Dislike for dentist N(%)	Dental clinic/hospital too far away N(%)	Perception the dental problem will go away N(%)	Other reasons (Work, Family etc) N(%)	p value
Location: Peri-urban	49(4.8)	67(6.6)	39(3.8)	26(2.5)	13(1.2)	86(8.5)	0.010*
Rural	281(27.8)	127(12.5)	123(12.2)	53(5.2)	51(5.0)	93(9.2)	
Education: Graduate or Postgraduate	09(0.7)	0(0)	13(1.2)	26(2.5)	35(3.4)	64(6.3)	0.001*
Intermediate or Post High school diploma	100(9.9)	41(4.0)	08(0.7)	17(1.6)	17(1.6)	38(3.7)	

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High school	18(1.7)	9(0.7)	22(2.1)	18(1.7)	9(0.7)	0(0)	
Middle school	90(8.9)	64(6.3)	22(2.1)	22(2.1)	38(3.7)	23(2.2)	
Primary school	72(7.1)	23(2.2)	45(4.4)	5(0.4)	0(0)	27(2.6)	
Illiterate	45(4.4)	0(0)	4(0.3)	39(3.8)	22(2.1)	23(2.2)	0.001*
Occupation: Professional	0	0	0	0	9(0.7)	36(3.5)	
Semi professional	5(0.4)	0	0	4(0.3)	9(0.7)	5(0.4)	
Clerical, shop owner/farm	13(1.2)	4(0.3)	13(1.2)	25(2.4)	13(1.2)	34(3.3)	
Skilled worker	74(7.3)	50(4.9)	22(2.1)	13(1.2)	17(1.6)	48(4.7)	0.001*
Semi skilled worker	115(11.4)	27(2.6)	45(4.4)	31(3.0)	21(2.0)	13(1.2)	
Unskilled worker	23(2.2)	22(2.1)	18(1.7)	0	0	9(0.7)	
Unemployed	80(7.9)	64(6.3)	48(4.7)	22(2.1)	22(2.1)	54(5.3)	
Socioeconomic status: Upper	0	0	0	0	0	18(1.7)	
Upper middle	28(2.7)	9(0.7)	13(1.2)	0	0	5(0.4)	
Lower middle	114(11.3)	71(7.0)	39(3.8)	22(2.1)	26(2.5)	39(3.8)	
Upper lower	198(19.7)	114(11.3)	106(10.5)	57(5.6)	38(3.7)	98(9.7)	
Lower	9	0	4(0.3)	0	0	0	

Table 2 represents the distribution of study participants based on their location, education, occupation, socioeconomic status and reasons for unmet dental treatment needs. Chi square test was used. A p value of <005 was considered to be statistically significant.

Table 3

Differences between gender and frequency of oral impact on daily performances among the study participants

Variables	Male (Median)	Female (Median)	p value
Difficulty in eating	446	402	0.029*
Difficulty in cleaning teeth	383	387	0.716
Difficulty in speaking	392	321	0.001*
Difficulty in smiling	357	366	0.496
Difficulty in relaxing	307	250	0.001*
Emotional disability	276	231	0.001*
Problem doing physical activity	403	380	0.029*
Problem in socializing	341	339	0.560

Table 3: Differences between gender and frequency of oral impact on daily performance domains. Mann Whitney U test was done. A *p value of <0.05 was considered to be statistically significant. A statistical significance was observed among gender and difficulty in eating, speaking, relaxing and doing physical activity.

Table 4
Differences between gender and severity of oral impact on daily performances
among the study participants

Variables	Male (Median)	Female (Median)	p value
Difficulty in eating	299	309	0.448
Difficulty in cleaning teeth	383	387	0.611
Difficulty in speaking	392	321	0.001*
Difficulty in smiling	357	366	0.458
Difficulty in relaxing	311	301	0.011*
Emotional disability	276	231	0.004*
Problem doing physical activity	403	380	0.055
Problem in socializing	341	339	0.941

Table 4: Differences between gender and severity of oral impact on daily performance domains. Mann Whitney U test was done. A *p value of <0.05 was considered to be statistically significant. A statistical significance was observed among gender and difficulty in speaking, relaxing and emotional disability.

Table 5
Differences between socioeconomic status and frequency of oral impact on daily
performances among the study participants

Variables	Upper (Median)	Upper Middle (Median)	Lower middle (Median)	Upper lower (Median)	Lower (Median)	p value
Difficulty in eating	18	55	267	499	9	0.041*
Difficulty in cleaning teeth	18	28	213	502	9	0.001*
Difficulty in speaking	18	46	202	438	9	0.003*
Difficulty in smiling	18	32	188	476	9	0001*
Difficulty in relaxing	9	37	171	331	9	0.454
Emotional disability	18	23	163	294	9	0.001*
Problem doing physical activity	18	37	236	483	9	0.033*
Problem in socializing	18	32	175	446	9	0.001*

Table 5: Differences between Socioeconomic status (SES) and frequency of oral impact on daily performance domains. Kruskal Wallis test was done. A *p value of <0.05 was considered to be statistically significant. A statistical significance was observed among all functions and socio economic status classes.

Table 6

Differences between socioeconomic status and severity of oral impact on daily performances among the study participants

Variables	Upper (Median)	Upper Middle (Median)	Lower middle (Median)	Upper lower (Median)	Lower (Median)	p value
Difficulty in eating	9	41	190	359	9	0.032*
Difficulty in cleaning teeth	18	28	213	502	9	0.001*
Difficulty in speaking	18	46	202	438	9	0.002*
Difficulty in smiling	18	32	188	476	9	0001*
Difficulty in relaxing	9	46	202	342	13	0.024*
Emotional disability	18	23	163	294	9	0.001*
Problem doing physical activity	18	37	236	483	9	0.122
Problem in socializing	18	32	175	446	9	0.001*

Table 6: Differences between Socioeconomic status (SES) and severity of oral impact on daily performance domains. Kruskal Wallis test was done. A *p value of <0.05 was considered to be statistically significant. A statistical significance was observed among all functions and socio economic status classes.

Discussion

The study was conducted among permanent residents of Tiruvallur district to assess their oral health status, unmet oral health needs and oral impact on daily life. The study consisted of 1008 participants, where we found an equal representation of both males and females. The results indicated that the sample population was representative of the Tiruvallur population. Majority of the participants belonged to the 18-34 years age group, followed by 35-44 years and 45-64 years, as our aim was to conduct the study among the adult population, a fair representation of the age groups was achieved. The mean DMFT observed in the entire study population was 5.77, interpreted to be on the higher side, and the results coincide with the study conducted by B.Sendilkumar[21] where the observed DMFT was 4.7, in Sukumaran A et al. study it was 5.5[22] and other similar studies[23,24]. The reason for this could be lack of knowledge among the population regarding maintenance of oral health care, also it correlates to the socioeconomic status of the population. About 60.6% of the participants belonged to the "Upper lower" SES scale, therefore limited earnings wage, poor quality of life is reflected in the high DMFT status.

In the current study, gingivitis was observed among 95.1%, periodontitis was observed among 38.7% of the study population which was very high, previous studies have reported similar findings[25,26] . Gingivitis which initiates mainly due to poor oral hygiene status progresses to periodontitis thus contributing to global burden of oral diseases. Studies have been conducted on oral hygiene awareness among similar populations which shows poor awareness[27]. Prevalence of dental

fluorosis was seen among 10.2% of the entire study population, with the severity varying from very mild, mild to moderate. In Tamil Nadu, the high concentration of fluoride in groundwater is found to be in Dharmapuri and Salem district closely followed by Coimbatore, Madurai, Trichy, Dindugal and Chidambaram district. The districts having low fluoride level are Tirunelveli, Pudukottai, North Arcot, and Ramnad districts[28-30]. Tiruvallur falls among the districts where fluoride concentration of water is low, therefore less severity of fluorosis is observed among the study participants.

Since our study focused only on the adult population, the prevalence of dental traumatic injuries consisting of enamel/dentin fractures, pulp involvement due to fractures were seen in about 15.3% of the population. Usually, traumatic injuries are more common among children and young adults[31,32] therefore that could be the reason for a comparatively less prevalence of traumatic injuries in this population. In the current study, enamel fracture consisted of 13.9% out of the total 15.3%, however literature reviews suggest enamel with dentin involvement fractures are mostly more common[33,34]. The present study presents a relatively low prevalence of dental trauma, but still this low percentage represents a large number of individuals. This study suggests initiation and implementation of public awareness studies that aims towards prevention and potential treatment strategies of dento-alveolar traumatic injuries. Fracture of anterior teeth results in poor smile and oral health has been related to poor social relationships and permanent disabilities that affect the ability to learn and grow which may lead to reduced self-esteem[35].

In the current study, the reasons for unmet dental treatment needs are qualitatively produced, where we observed 27.8% of the rural residents, 19.7% of the upper lower SES status couldn't avail the dental services due to lack of funds. The main reason for this is the lack of regulation and governing policies regarding dental care. A statistically significant relation was observed between location, occupation, education status, SES and reasons for not availing dental care. Reasons including, fear towards dentist unavailability of dental services, high cost, lacking knowledge of oral health care, perception that pain will go away lack of time were also reported in the current study, which were found to be similar with other studies conducted all over India[21,36].

Conclusion

The findings of the study conclude the oral health status of the study population was poor as dental caries, gingival diseases were found to be prevalent among the population. Poor oral health status was related to factors like age groups, gender, and socioeconomic status. The most commonly stated reason for unmet dental treatment needs was "financial" in this study. There was association between rural settings, lower, upper lower classes and unmet dental treatment needs.

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