Oral Health Status and Treatment Needs of Young Adults in Udaipur, India: A Cross-Sectional Study

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Abstract

Background: Younger age-groups are likely to suffer greater dental disease in future unless effective self-care preventive measures-in the narrower sense are not used. Aims: To assess the oral health status and treatment needs of students attending various colleges of Udaipur, India.

Methods: A cross sectional descriptive survey was conducted among 800 subjects (536 males and 264 females) aged between 17-24 years in Udaipur. Oral health status and treatment need was assessed using WHO guidelines. Body mass index (BMI) was recorded along with oral hygiene practices, adverse habits and socio-economic status. Univariate analysis (Chi square test) and multivariate analysis (multinomial logistic and multiple linear regression) was employed for statistical analysis.

Results: Prevalence of TMJ clicking, oral mucosal conditions, enamel opacities, dental fluorosis, CPI, loss of attachment, dental caries, prosthetic status, prosthetic need and DAI was 1.7% 6.3%, 27.1%, 43.1%, 87.6%, 7.7%, 62.3%, 5.1%, 7.5% and 5.8% respectively. One surface filling (60%) was the most prevalent treatment need among study population Best predictors in the descending order for CPI oral hygiene practices, adverse habits, gender and socioeconomic status with variances of 3.2%, 4.7%, 5.5% and 6.2 respectively. Risk factors for caries; lower socioeconomic status, female gender, obese nutritional status, use of chewsticks and intake of tobacco and alcohol (OR=1.0, 2.6, 1.5, 2.2 and 1.8 respectively).

Conclusion: Higher prevalence of oral diseases and treatment needs suggests a very poor accessibility and availability of oral health care in addition to low utilization of preventive or therapeutic oral health services.

***Key Words**: Cross sectional, Oral health, Treatment needs, Young adults*

Introduction

Oral health is understood as a dentition which is comfortable, functional, and with such an appearance that allows the people to perform their social functions and daily activities without physical, psychological or social inconveniences [1]. Oro-dental diseases are among the most widespread diseases around the globe [2]. Although not an important cause of mortality, these may have sometimes serious repercussions upon the general health of people.

Oral diseases in adults negatively impact their employability and systemic health [3]. In developed countries, more young individuals now tend to preserve their natural teeth and the proportion of adults with functional dentition had increased markedly [4]. Such changes in oral health are often ascribed to the population's changing living conditions and lifestyles, effective use of oral health services, implementation of preventive oral health care programmes, development of regular self-care practices and use of fluoride toothpaste [5]. In contrast, many developing countries are now facing problems of poor oral health and this seems particularly to be the case for those countries where community-based oral health care systems have not been established [6].

In view of adverse effects of poor oral health, it is important to take preventive measures and provide the required services. Young age groups, perhaps have the most to gain from the effective new strategies since they are likely to suffer greater dental disease in future unless effective self-care preventive measures-in the narrower sense are not used. For this purpose, it is necessary to know the prevalence of oral health problems and understand dental health practices among the people particularly in the young age group. Basic oral health surveys provide the baseline data necessary for formulation of oral health policies and implementation of appropriate programmes to improve awareness and knowledge of general public about the preventive aspects of oral health.

India has vast geographic area divided into states which differ with regard to their socioeconomic, educational, cultural and behavioural tradition. These factors may affect oral health status of the population. Hence to obtain national representative data nationwide multicentric study is required. More practical alternative is to develop regional database; review of such observations from various region may provide understanding of national scenario. Against this background and fortified with the fact that comprehensive community wide studies are few in Indian setup, this study is conducted with the underlying aim.

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Aims

To assess the oral health status and treatment needs of young adults of Udaipur in India.

Methods

Study type and study design

A cross-sectional descriptive survey was conducted from September 2011 to February 2012 among 800 youths aged 18-24 years attending various professional and non-professional bachelor degree colleges of Udaipur city, India. Subjects with orthodontic bands, systemic diseases and on antibiotic therapy in the previous six months were excluded from the study.

Sample size and sampling method

A pilot study was carried out among 100 students from 2 colleges to assess the feasibility and practicability of the study. The prevalence of dental caries was found to be 66%. Fixing α at 5% and β at 20%, the sample size was estimated at 791 which was rounded off to 800 subjects.

Before the instigation of the study, official list of all the colleges (professional and non-professional) of Udaipur city was obtained from Mohanlal Sukhadia University, Udaipur, India. A two-stage random sampling procedure was used to select the study sample. The first stage units were all colleges in Udaipur city. Twenty percent (20 colleges) of the total number (102) of colleges were randomly selected using lottery method. The second stage was the students in each selected college. From a list encompassing all the students (5996) enrolled in the 20 colleges a sample of 800 students were selected based on systematic random sampling procedure.

Methods of data collection

Proforma details:

A survey proforma designed with the help of WHO Oral Health Assessment form (1997) [7] included:

1. General information: Demographic data with age, gender, socioeconomic status (Prasad's classification) [8] and nutritional status.

2. Information about oral hygiene practices and adverse habits.

3.Clinical parameters: Extra oral examination, Temporomandibular joint assessment, Oral mucosal lesions, Enamel opacities/Hypoplasia, Dental fluorosis, Community periodontal status, Loss of attachment, Dentition status and Treatment needs, Prosthetic status and needs, and Dento-facial anomalies.

Training and calibration:

Preceding the commencement of the study, examiner was standardized and calibrated in the Department of Public Health Dentistry by a senior Faculty member to ensure uniform interpretations, understanding and application of the codes and criteria for the diseases to be observed and recorded and to ensure consistent examination. The examiner first practiced the examination on a group of 10 subjects with the wide range of levels of disease condition. The data on oral health status and treatment need was entered on a WHO Oral Health Assessment Form (1997). Then a group of 20 subjects with varying levels of oral diseases were examined on two successive days and the results were compared to know the diagnostic variability. Agreement for assessment was 90% for DMFT and 84% for CPI.

Conducting the examination

Anthropometric measurements were recorded prior to clinical examination. Height of the participants was measured in centimeters, using a hard ruler installed vertically and secured with a stable base, while weight was assessed in kilograms using a mechanical scale. The scale used was certified by the Controller of Legal Metrology (Weights and Measures), India. Individuals were clinically examined for all parameters according to WHO guidelines (1997). Duplicate examination was conducted on 5% (n=40) of the population during the course of the study (kappa statistic =90%).

Ethical considerations

The study protocol was reviewed by the Ethical Committee of Pacific Dental College and Hospital and was granted ethical clearance. An official permission was obtained from the Principals/Directors of the concerned colleges. A written informed consent was acquired from all the study participants.

Statistical analysis:

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor of SPSS version 15.0 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means and standard deviations. The BMI was calculated as the ratio of the subject's body weight (in kg) to the square of their height (in meters). Based on the WHO criteria, four categories were defined: underweight (BMI < 18.5 kg/ m^2), normal weight (BMI from 18.5 to 24.9 kg/m^2), overweight (BMI from 25 to 29.9 kg/m^2), and obese (BMI > 30 kg/m^2) [9]. Upper high and High Socioeconomic status group were merged together to form High socioeconomic status group and the other three (Upper middle, lower middle and poor) were merged together to form Low socioeconomic status group.

The chi-square test (χ^2) was used for comparison of all clinical indicators between age and gender groups. In 2X2 contingency table, if any one of the cells had the expected count less than 5 or any one of the row or column totalled less than 30 and if total number of observations was more than 40, then Pearson chi-square with continuity correction was considered and if total number of observations was less than or equal to 40 then Fisher exact test was applied. For the tables larger than 2X2, chi-square test was applied only when no more than 20% of the cells had expected cell frequency less than 5 and no cells had expected cell frequency less than 1. If any of these criteria's were violated then merging of the cells were considered. Multivariate analysis with DMFT and CPI as the dependent variables were performed using step-wise multiple linear regression determining the risk predictors and multinomial logistic regression estimating values of odds ratio (OR) and the respective 95% Confidence interval (CI), indicating statistical significance if both the values are above or below 1. Goodness of fit was assessed by means of Hosmer and Lemenshow test. A p- value of less than 0.05 indicated statistical significance.

Results

General profile of the study population *(Table 1)*

Total population comprised of 536 (67%) males and 264 (33%) females with the mean age of 21.7±3.85 years. A nearly

Table 1. *General profile of the study population (n=800).*

Variables	Gender n (%)		Total
	Males 536 (67)	Females 264 (33)	
Socioeconomic status			
Upper	276 (51.5)	133 (50.4)	409 (51.1)
Lower	260 (48.5)	131 (49.6)	391 (48.9)
Nutritional status			
< 18.5 (underweight)	43 (8.0)	31 (11.7)	74 (9.2)
18.5-24.9 (normal weight)	383 (71.5)	178 (67.4)	561 (70.1)
25.0-29.9 (overweight)	71 (13.2)	33 (12.5)	104 (13.0)
≥ 30.0 (obese)	39 (7.3)	22 (8.3)	61 (7.7)
Oral hygiene practices			
Tooth brush + Tooth paste/ Tooth powder	474 (88.4)	225 (85.2)	699 (87.4)
Finger + Tooth paste/ Tooth powder	17 (3.2)	13 (4.9)	30 (3.7)
Chew sticks	45 (8.4)	26 (9.8)	71 (8.9)
Any other oral hygiene aids	0 (0.0)	0 (0.0)	0 (0.0)
Adverse habits			
Smoking Tobacco	188 (35.1)	21 (7.9)	209 (26.1)
Smokeless Tobacco	107 (19.9)	1 (0.3)	108 (13.5)
Smoking Tobacco+ Smokeless Tobacco	125 (23.3)	2 (0.7)	127 (15.9)
Alcohol	268 (50)	18 (6.8)	286 (35.7)
Tobacco+Alcohol	171 (31.9)	2 (0.7)	173 (21.6)

equal distribution of upper (51.5% males and 50.4% females) and lower (48.5% males and 49.6% females) socioeconomic status was seen. Majority of the subjects (70.1%) belonged to the normal nutritional status group and very few (7.6%) were obese. Normal practice of oral hygiene method was toothbrush with toothpaste/toothpowder and this proportion was higher among males (88.4%) than females (85.2%). Practice of chewsticks was reported in less than ten percent of the subjects. The prevalence of adverse habits was more in males with highest proportion reporting alcohol consumption (50%) followed with other habits. Among females, smoking tobacco (7.9%) and alcohol (6.8%) use were the major habits and this prevalence was less than 10%.

TMJ assessment revealed majority of the subjects (98.3%) had no TMJ symptoms. Among the signs, TMJ clicking was the only sign observed. Greater percentage of males (2.2%) elicited clicking than females (0.8%) but the difference observed was not statistically significant (p=0.161). Among the subjects (6.2%) with oral mucosal conditions, majority suffered from pericoronitis (3.8%) followed by ulceration (1.4%) and abscess (1.1%). It was found that males in higher proportion suffered from hypoplasia (6.9%) and diffuse opacities (5.6%) as compared to females, but the difference was not significant (p=0.469). The prevalence of prosthetic status and need among males and females was 5.1% and 7.5% respectively. A significant (p=0.001) age difference was noted in the prosthetic status among the study subjects. None of the subjects presented with partial denture or full removable denture. Presence of more than one bridge was virtually absent in males. Greater proportion of females (7.6%) revealed the presence of bridge. Though prosthetic need revealed no statistically significant difference by gender (p=0.319) the pattern of the distribution explained that there was greater need in males (8.2%). (Data not shown)

Prevalence of dental diseases among young adults according to gender *(Table 2)*

Prevalence of Enamel Opacities / Hypoplasia was 27.1%. The most commonly seen developmental defect of enamel was hypoplasia being present in 7.1% subjects followed by diffuse opacity (6%) and demarcated opacity (4.4%). It was found that males in higher proportion suffered from hypoplasia (6.9%) and diffuse opacities (5.6%) as compared to females, but the difference was non-significant (p=0.469). No dental flourosis was evident in 56.9% of the youth. Questionable form of dental fluorosis was observed in 14.9% subjects, followed by moderate (10.3%), very mild (7.8%), mild (6%) and severe fluorosis (4.1%). A non significant association (p=0.052) by gender was observed with females portraying a greater prevalence of questionable (15.5%), moderate (11%) and severe (5.3%) forms of fluorosis. Proportion of very mild and mild fluorosis was higher among males (10.1% and 6.1% respectively).

Overall prevalence of periodontal disease was high (87.6%) with majority of study subjects having calculus (45.8%) followed by bleeding gums (40%). Pockets were evident among 1.8% of the subjects. Significant variance (p=0.001) by gender was ascertained with higher percentage of calculus (49.2%) found in females than males. The prevalence of loss of attachment was low (7.7%) with none showing loss of attachment more than 9 mm. The prevalence of loss of attachment decreased with increasing depth. No statistically significant difference was observed by gender (p=0.304).

Dental caries prevalence was 62.6% with high and very high prevalence of DMFT scores observed among 12.6% of the subjects. A statistical significant difference by gender groups was noted (p=0.001) with highest fraction of females with very high DMFT scores (14.8%) in comparison to 7.5% among males. Overall 77.6% of the subjects were with no or minor malocclusion followed by 9.9% with definite malocclusion. Severe and very severe malocclusion was reported in 6.8% and 5.8% of the subjects respectively.

Table 2. *Prevalence of dental diseases among the study population according to gender (n=800).*

Variables	Total	Gender		Chi-square value	p-value
		Male n (%)	Female n (%)		
Enamel opacities					
Normal	583 (72.9)	387 (72.2)	196 (74.2)	6.620	0.469
Demarcated opacity	35 (4.4)	29 (5.4)	6 (2.3)		
Diffuse opacity	48 (6.0)	30 (5.6)	18 (6.8)		
Hypoplasia	57 (7.1)	37 (6.9)	20 (7.6)		
Demarcated and diffuse opacity	34 (4.3)	25 (4.7)	9 (3.4)		
Demarcated opacity and hypoplasia	19 (2.4)	14 (2.6)	5 (1.9)		
Diffuse opacity and hypoplasia	13 (1.6)	8 (1.5)	5 (1.9)		
All the three conditions	11 (1.4)	6 (1.1)	5 (1.9)		
Dental Fluorosis					
Normal	455 (56.9)	295 (55.0)	160 (60.6)	15.542	0.052
Questionable	119 (14.9)	78 (14.6)	41 (15.5)		
Very mild	62 (7.8)	54 (10.1)	8 (3.0)		
Mild	49 (6.1)	37 (6.9)	12 (4.5)		
Moderate	82 (10.3)	53 (9.9)	29 (11.0)		
Severe	33 (4.1)	19 (3.5)	14 (5.3)		
Community Periodontal Index (CPI)					
Healthy	99 (12.4)	48 (9.0)	51 (19.3)	26.481	0.001*
Bleeding	320 (40.0)	241 (45.0)	79 (30.0)		
Calculus	367 (45.8)	237 (44.2)	130 (49.2		
Pocket (4-5mm)	10 (1.3)	7 (1.3)	3 (1.1)		
Pocket (6-8mm)	4 (0.5)	3 (0.6)	1 (0.4)		
Loss of attachment					
0-3mm	738 (92.3)	490 (91.4)	248 (93.9)	2.381	0.304
4-5mm	49 (6.1)	35 (6.5)	14 (5.3)		
6-8mm	13 (1.6)	11 (2.1)	2 (0.8)		
9-11 mm	0 (0)	0 (0)	0 (0)		
Dental caries (DMFT)					
Very low (0.1-1.1)	185 (23.1)	126 (23.5)	59 (22.3)	18.784	0.001*
Low (1.2-2.6)	88 (11.0)	57 (10.6)	31 (11.7)		
Moderate (2.7-4.4)	127 (15.9)	100 (18.7)	27 (10.2)		
High (4.5-6.5)	22 (2.7)	17 (3.2)	5 (1.9)		
Very high (>6.5)	79 (9.9)	40 (7.5)	39 (14.8)		
Malocclusion (DAI)					
No or minor , No/ slight need	621 (77.6)	405 (75.6)	216 (81.8)	12.690	0.005*
Definite, Elective treatment	79 (9.9)	67 (12.5)	12 (4.5)		
Severe, Highly Desirable	54 (6.8)	34 (6.3)	20 (7.6)		
Very severe,	46 (5.8)	30 (5.6)	16 (6.1)		

Greater proportion of females [n=216 (81.8%)] belonged to no or minor malocclusion category. The definite malocclusion was considerably higher in males (12.5%) but severe and very severe malocclusion was found to be more in females (7.6% and 6.1%). The difference was statistically significant (p=0.005) between gender groups.

Treatment needs ***(Table 3)***

One surface filling (60%) was the most prevalent treatment need among the study population followed by pulp care and restoration (45%) and two surface filling (41.2%). Extraction and crown for any reason were required in 27.4% and 7.5% of the study subjects respectively.

Multiple linear regression ***(Table 4)***

Regression was applied between DMFT and CPI as the dependent variables and other independent variables. The best predictors in the descending order for DMFT were gender, age, oral hygiene practices, adverse habits, socioeconomic status and nutritional status with variances of 6.7%, 10.1%, 13.8%, 17.4%, 18.2% and 21.7% respectively. Similarly for CPI oral hygiene practices, adverse habits, gender and socioeconomic status with variances of 3.2%, 4.7%, 5.5% and 6.2 respectively were the best predictors.

Multinomial logistic regression ***(Table 5)***

The results indicated following variables as risk factors for caries; lower socioeconomic status, female gender, obese nutritional status, use of chewsticks and intake of tobacco and alcohol (OR=1.0, 2.6, 1.5, 2.2 and 1.8 respectively). Females are less likely to suffer from periodontal disease (OR=0.7). Subjects from upper socio economic status were less susceptible to periodontal disease compared to lower class (OR=0.4). Subjects who use other oral hygiene aids and consume tobacco and alcohol are more likely to have periodontal disease compared to their counterparts (OR=4.2 and 2.1 respectively).

Discussion

The present study was attempted to investigate the oral

Table 3. *Prevalence of treatment needs among study population.*

Treatment needs	n	%
Preventive care	28	3.5
Fissure sealant	28	3.5
One surface filling	480	60.0
Two surface filling	330	41.2
Crown for any reason	60	7.5
Veneer and laminate	53	6.6
Pulp care and restoration	360	45.0
Extraction	219	27.4
Need for other care	43	5.4

Table 4. *Stepwise multiple linear regression analysis with Dental caries and Community Periodontal Index as dependent variables.*

Model	R	R^2	F- value	p-value
Dental caries				
1	0.258(a)	0.067	69.88	0.001(a)
2	0.317(b)	0.101	54.64	0.001(b)
3	0.372(c)	0.138	52.17	0.001(c)
4	0.417(d)	0.174	51.33	0.001(d)
5	0.427(e)	0.182	43.29	0.001(e)
6	0.466(f)	0.217	41.76	0.001(f)
a	Predictors: (Constant), gender			
b	Predictors: (Constant), gender, age			
c	Predictors: (Constant), gender, age, oral hygiene practices			
d	Predictors: (Constant), gender, age, oral hygiene practices, adverse habits			
e	Predictors: (Constant), gender, age, oral hygiene practices, adverse habits, socioeconomic status			
f. Predictors: (Constant), gender, age, oral hygiene practices, adverse habits, socioeconomic status, nutritional status				
Community Periodontal Index				
1	0.179(a)	0.032	32.34	0.001(a)
2	0.216(b)	0.047	23.93	0.001(b)
3	0.235(c)	0.055	18.97	0.001(c)
4	0.249(d)	0.062	16.07	0.001(d)
a	Predictors: (Constant), oral hygiene practices			
b	Predictors: (Constant), oral hygiene practices, adverse habits			
c	Predictors: (Constant), oral hygiene practices, adverse habits, gender			
d	Predictors: (Constant), oral hygiene practices, adverse habits, gender, socioeconomic status			

Table 5. *Multinomial logistic regression with DMFT and CPI dependent variables.*

Variables	DMFT		p- value	CPI		p-value
	OR	CI		OR	CI	
Socioeconomic status						
Lower	1	-	0.04*	1	-	0.03*
Upper	0.7	0.3-0.9		0.4	0.1-0.6	
Gender						
Male	1	-	0.01*	1	-	0.01*
Female	2.6	1.6-3.0		0.7	0.2-0.9	
Nutritional status						
< 18.5 (underweight)	1	-	0.05*	1	-	0.06
18.5-24.9 (normal weight)	1.1	1.0-2.1		0.7	0.2-1.9	
25.0-29.9 (overweight)	1.2	1.1-1.9		1.3	0.4-1.8	
≥ 30.0 (obese)	1.5	1.0-2.3		1.6	1.1-3.5	
Oral hygiene practices						
Tooth brush + Tooth paste/ Tooth powder	1	-	0.02*	1	-	0.01*
Finger + Tooth paste/ Tooth powder	2.1	1.6-3.2		3.4	2.4-3.9	
Chew sticks	2.2	1.3-3.4		4.1	2.2-4.8	
Any other oral hygiene aids	2.0	1.2-2.3		4.2	3.1-4.7	
Adverse habits						
Smoking Tobacco	1	-	0.03*	1	-	0.01*
Smokeless Tobacco	0.8	0.1-0.9		1.7	1.2-2.4	
Smoking Tobacco+ Smokeless Tobacco	1.3	1.1-2.1		1.9	1.1-2.8	
Alcohol	1.2	1.1-1.6		1.4	1.1-3.1	
Tobacco+Alcohol	1.8	1.3-2.5		2.1	1.5-3.4	

health status and provide the basis for the assessment of treatment needs and development of preventive dental health care strategies. We focussed on younger age group in the age range of 18- 24 years. The most prevalent oral hygiene practice reported was toothbrush and tooth paste for cleaning their teeth and smoking tobacco was the adverse habit, which corroborates with the findings of Eldarrat et al. [10].

In regard to temporomandibular joint assessment, TMJ clicking was the only sign observed, the prevalence being 1.7% which was in agreement with the study conducted by Vojdani et al. [11]. We found a non-significant male predominance which is in contrast with the observations of Nomura [12]. Pow et al. [13] noted a similar situation of male predominance where the reason was attributed to higher prevalence of oral and parafunctional habits such as bruxism among males. The prevalence of oral mucosal lesions and conditions was very low compared to related studies [14,15]. The most frequently observed were pericoronitis (3.8%), ulceration (1.4%), and abscess (1.1%). In previous reports, prevalence rates for oral mucosal lesions have shown wide variation, and may be attributed to underlying differences in the geographic areas studied, socio-demographic characteristics of the examined population, the research methodologies used, and the diagnostic criteria employed [14]. In the present study, lesions were more prevalent among males than females which are in harmony with the study conducted by Shulman [16]. Gender differences might be attributed to the high consumption of tobacco by males, differences in genetic factors and social responsibility [17].

The prevalence of developmental defects of enamel (27.1%) found in the study is somewhat similar to the prevalence obtained by Hoffman et al. [18], but much less than 100% among children from China [19]. The variation could be due to the types of defects studied; different classifications of indices used; different field settings and technical examination procedures, such as lighting or whether teeth were dried or not; and factors in the population such as genetic, racial, ethnic and socioeconomic status [18]. Hypoplasia was the most commonly observed defect which is in corroboration with the findings of Vargas-Ferreira [20].

Overall prevalence of fluorosis was seen to be 43.1% which was in line with findings of another study conducted by Dhar et al. [21] among 11-14 years Udaipur children (40.52%). Not surprisingly, in the present study, dental fluorosis revealed no significant difference between genders. This is consistent with other studies conducted Gladys et al. [22] in Kenya and Hamdan[23] in Jordan.

In the present study, 87.6% of participants experienced various forms of periodontal disease. Majority of them had calculus (45.8%) and bleeding (40.0%) which are analogous to those obtained by Chu et al. [24]. Consistent with the findings reported previously [25],pockets were evident only in 1.8% of the subjects. Females were periodontally healthier as compared to males which are in correlation with several other studies [26]. The reason why gender affects periodontal health status may be attributed to the habit and conscious of females in maintaining a better oral hygiene practice and greater consumption of tobacco and alcohol among males. An approximating frequency of attachment loss (7.7%) with earlier study [27] was observed in the present study sample. The predictors for periodontal disease as identified by stepwise linear regression were oral hygiene practices, adverse habits, gender and socioeconomic status. Sogi et al. [28] in Davangere, India reported that dental caries experience and oral hygiene status of children were strongly correlated to socio-economic status (OR=0.9).

Caries prevalence in the present study was 62.3%, coinciding with the study reported by Kaur [29]. This high caries experience may be attributed to factors such as poor dietary or oral hygiene habits. Comparison based on gender showed that females had significantly more caries than males which correlates with the study reported by Garcia-Cortes et al. [30]. The increased susceptibility of girls to caries with 2.6 odds may be explained by early eruption of teeth; morphological differences between teeth of males and females; increased fondness toward sweets among girls and hormonal changes. Obese are 1.5 times more likely to have caries than normal. This finding correlates with those of Thippeswamy [31]. Ludwig [32] in a longitudinal study found that the increasing prevalence of obesity in children is linked to the consumption of sugar-sweetened drinks. The caries was as well high in the low socioeconomic status (OR=4.1) as it can affect the degree of education, health, values, life styles and access to health care information, thereby increasing susceptibility to caries.

Prosthetic status (5.1%) of the study population coincides with the findings of Correa et al [33]. A significant increase in prevalence was observed with increasing age similar to the findings of previous study [34]. The need for one or more prosthesis was approximately similar as reported by Shekhar[35] and almost half compared to Kumar [36], for the 15-24 years age group. The reason for this discrepancy may be attributed to difference in criteria used in assessment of prosthetic needs between the studies. For the age group 15-24 years old, the main reason for tooth loss is attributed to dental caries [36]. In the present study, no association of prosthetic need with gender was evident [35].

On the whole, malocclusion affected 22.4% of the participants which is equivalent to the prevalence obtained by Marques et al. [37] among 14-18 years old subjects. This may be due to the fact that orthodontic concern is still given low priority in oral health care in this area and there is an absence of planning orthodontic care programmes. Instead, orthodontic care is only provided on the basis of paid service by trained specialist orthodontist who makes it expensive and unaffordable. Confirmation to significant association of malocclusion to gender is provided in the evidence by Dhar et al. [21].

One surface filling (60.0%) was the most frequent treatment needed among the study population followed by pulp care and restoration (45%) and two surface filling (41.2%). Lack of knowledge about good oral hygiene practices, lack of motivation, low priority given to dental care in society, lack of facility for young adults and regular oral health check up and prompt treatment and finally cost of the treatment may be the factors contributing to large unmet treatment needs.

This epidemiological survey provided baseline information to underpin the implementation of oral health programmes. In light of high prevalence rates of dental diseases and

treatment needs in the study population, the health policy that emphasizes oral health promotion and prevention would seem more advantageous in addition to traditional curative care. The nature of the study was cross-sectional study, thus precluding the ability to draw inferences about causal relationships. Furthermore, more research is required involving longitudinal study on the same target population impinging the risk factors involved in the causation of oral disease.

Conclusion

The results exhibited a comprehensive assessment of oral health status and treatment needs indicating a high prevalence of periodontal disease and dental caries, which may be useful in designing investigations that will aim further to explore the causes for these findings and more importantly to plan oral health promotion program implementing both preventive and curative strategies.

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