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RESEARCH ARTICLE

Assessment of factors determining oral health status among adolescents residing in an urban area of North India

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Abstract

Background: Oral health is fundamental to overall health and quality of life as it ensures social and physical well-being and acts as a mirror which reflects general health. Studies regarding the assessment of oral health would help in planning the preventive steps needed to keep the population disease free.

Objectives: To assess factors determining oral health status among adolescents residing in an urban area of North India.

Methodology: A cross sectional community based study was conducted among adolescents aged 10 to 19 years, residing in the field practice area of the Urban Health and Training Centre (UHTC). Total 1152 adolescents were included in the study.

Results: Out of 1152 participants, 62.9% were male and 37.1% were female. Dental caries was found among 35.7% adolescents and 29.7% adolescents were having more than one type of oral morbidities. Among the 411 participants suffering from dental caries 229 (55.7%) were boys and 182 (44.3%) were girls. Tobacco addiction (chewing and smoking) was present in 216 (18.75%) of the participants. Only 15.3 % adolescents had good knowledge, and 34.5% adolescents had a positive attitude.

Conclusion: Oral health is strongly related with frequency of mouth washing, type of cleaning aids and rinsing of mouth after meals. In order to make population disease free, awareness among adolescents about oral health is strongly recommended and also there should be availability of easily accessible and affordable oral health services.

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INTRODUCTION

Oral health is an essential part of overall health and has an important influence on the quality of life as it ensures a social and physical well-being (Jayashree *et al.*, 2002). Oral health is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, any problems or trauma to the jaw or middle of the face and other diseases and disorders that limit an individual's

capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing (Chalmers, 2003). Oral hygiene is seen as a natural part of total body cleanliness and it is often seen that people desire fresh and healthy mouth with good smelling breath (Bhowate *et al.*, 1994; Goyal *et al.*, 1994; Jayashree *et al.*, 2002).

Oral hygiene and personal hygiene are the cheapest form of preventive health measure. Oral health is often ignored in the underprivileged rural and urban slum communities (Okolo, 2006). Oral diseases are thus topping the list of some common diseases in the world. Dental caries is one of the commonest dental problems affecting children in all age groups involving both primary and permanent teeth. Higher caries prevalence is anticipated in adolescent age group who may also not understand and assume responsibility for or co-operate with preventive oral health practices (Murray and Lopez, 1997). It is important that prevalence of caries in a given population is assessed at regular intervals of time to ascertain the spread of disease and need of preventive and restorative care. Studies would also help in planning the preventive steps needed to keep the population disease free. Therefore, the present study was carried out to determine the oral health status of adolescents aged 10 to 19 years, residing in the field practice area of Urban Health Training Centre (UHTC).

MATERIALS AND METHODS

Study Design: A cross sectional community based study was conducted among adolescents aged 10 to 19 years, residing in the field practice area of the Urban Health and Training Centre (UHTC). This study was conducted to find out the oral health status and the various factors affecting oral health status among the adolescent population. Institutional research and ethical approval was obtained and the study was conducted from January to March, 2015.

Sampling technique: Simple random sampling was done. In the urban area, all the lanes, sub lanes and houses were numbered. Within each lane the first household was selected randomly. All the remaining houses were visited serially till the desired sample size was reached.

Inclusion criteria: Adolescents in the age group 10 to 19 years were included in the sample.

Exclusion criteria: Individuals who refused to participate and those not present for interview, locked houses, etc were excluded.

Study subjects: From the surveyed sample, 1152 adolescent participants aged 10 to 19 years were included in the study.

Method: A pre-designed interview schedule was used to collect the necessary information from the participants. Consent was obtained after explaining the purpose of the study and taking in confidence the participants and their parents. Clinical oral examination of all the subjects was done with the help of torch and natural day light. Socioeconomic status was calculated using the Modified BG Prasad's Classification for 2014.

Instruments used for examination: Plain mouth mirror, periodontal probes, two containers (one for used instruments and one for sterilized instruments), concentrated sterilizing solution, soap and water. With proper use of mouth mirror and periodontal probe all areas of oral cavity could be fully examined without the need for digital manipulation of the oral tissues.

Terminologies used: *Manjan*: preparation from crushed coal powder. *Datun*: Small stem of *miswaq* plant / *neem* tree. *Dental caries*: A microbial disease of the calcified tissues of teeth, characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth. *Tobacco addiction*: The addiction of tobacco was labelled when the users having habit since last six months.

Statistical analysis: Data from the interview schedule was transferred to a computer. The SPSS Data Editor Software version 19 was used for analysis of the data. Chi-square test was performed. Logistic regression analysis was done to find out the Odds Ratio (OR), and the associated risk. P value ≤ 0.05 were considered statistically significant.

RESULTS

Out of 1152 participants, 725 (62.9%) were male and 427 (37.1%) were female. Mean age of the participants was 15.29 ± 2.77 years. 28.5% were living in nuclear families, 33.9% were illiterate, and 33.4 % belonged to socioeconomic Class III (Table 1).

Among the 411 participants suffering from dental caries, 229 (55.7%) were boys and 182 (44.3%) were girls. 342 (29.7%) adolescents were having more than one type of oral morbidities. 179 (15.5%) of the participants had plaque (Table 2).

Among the participants using finger as cleaning aid, 60.8% had dental caries. Among those not using any cleaning material, dental caries was present in 81.8% of participants. Among those cleaning their mouth once a day had dental caries in 37.3% of participants. Among those not rinsing their mouth after meals, 40.3% had dental caries. These were statistically significant (Table 3).

Tobacco addiction in the form of tobacco chewing and smoking was present in 216 (18.75%) participants. This was statistically significant. On univariate regression analysis, tobacco use showed increased risk of dental caries (OR = 5.88). Good knowledge regarding oral hygiene was found to be associated with reduced risk of dental caries (OR = 0.71) (Table 4).

Among the 411 participants suffering from dental caries, only 15.3 % had good knowledge of oral hygiene, and only 34.5% had a positive attitude towards dentists. 56.2 % had suffered from tooth ache in the past one month, and 33.3 % had sought medical treatment (Table 5).

Table 1: Socio-demographic characteristics of participants.			
Characteristics		Number of participants (N= 1152)	Percent
Age	≤ 15 years	489	42.4%
	> 15 years	663	57.6%
Sex	Male	725	62.9%
	Female	427	37.1%
Type of family	Nuclear	328	28.5%
	Joint	389	33.8%
	Three Generation	435	37.8%
Educational Status	Illiterate	391	33.9%
	Primary School	379	32.9%
	High School	246	21.4%
	Senior Secondary School	136	11.8%
Socio Economic Status	Class I	134	11.6%
	Class II	258	22.4%
	Class III	385	33.4%
	Class IV	201	17.4%
	Class V	174	15.1%

Table 2: Distribution of participants according to oral health status.		
* Morbidity	Number of participants (N= 1152)	Percent
Nil	623	54.1%
Dental caries	411	35.7%
Plaque	179	15.5%
Bleeding gums	88	7.6%
Ulcer	85	7.4%
Tartar	75	6.5%
Calculus	56	4.9%
Fibrosis	24	2.1%
Injury	21	1.8%
* 342 (29.7%) participants had more than one morbidity.		

Table 3: Association of dental caries with various indicators (N= 1152).				
Indicator	Dental caries		Total (N = 1152) (100%)	* p value
	Present (N = 411) (35.7%)	Absent (N = 741) (64.3%)		
Type of cleaning aid				
Finger	107 (60.8%)	69 (39.2%)	176 (100%)	< 0.001
Datun	216 (45.1%)	263 (54.9%)	479 (100%)	
Tooth brush	88 (17.7%)	409 (82.3%)	497 (100%)	
Cleaning material				
Nil	27 (81.8)	6 (18.2%)	33 (100%)	< 0.001
Manjan	162 (51.8%)	151 (48.2%)	313 (100%)	
Tooth powder	148 (39.9%)	223 (60.1%)	371 (100%)	
Tooth paste	74 (17.0%)	361 (83.0%)	435 (100%)	
Frequency of cleaning				
Once per day	399 (37.3%)	672 (62.7%)	1071 (100%)	< 0.001
≥ Twice per day	12 (14.8%)	69 (85.2%)	81 (100%)	
Rinsing mouth after meals				
No	364 (40.3%)	539 (59.7%)	903 (100%)	< 0.001
Yes	47 (18.9%)	202 (81.1%)	249 (100%)	
* Chi-Square test was applied; p < 0.05 was considered as statistically significant. N=Number of participants.				

Table 4: Association between dental caries and lifestyle variables (N = 1152)

Variables	Dental caries		Total (N = 1152) (100%)	* p value	**Odds Ratio (95% CI)
	Present (N = 411) (35.7%)	Absent (N = 741) (64.3%)			
Tobacco addiction					
YES	150 (69.4%)	66 (30.6%)	216 (100%)	< 0.001	5.88 (4.26-8.11)
NO	261 (27.9%)	675 (72.1%)	936 (100%)		
Knowledge					
Good	63 (29.4%)	151 (70.6%)	214 (100%)	0.035	0.71 (0.51-0.98)
Poor	348 (37.1%)	590 (62.9%)	938 (100%)		
* Chi square test was applied; p value < 0.05 statistically significant. ** Univariate regression analysis. Unadjusted Odds Ratio. CI = 95% confidence interval. N=Number of participants.					

Table 5: Knowledge attitude and practice of participants with dental caries.

Parameters		Number of participants (N= 411)	Percent
Knowledge of oral health	Good	63	15.3%
	Poor	348	84.7%
Attitude towards dentist	Positive	142	34.5%
	Negative	269	65.5%
Tooth ache in last 15 days	Yes	231	56.2%
	No	180	43.8%
Treatment taken	Yes	137	33.3%
	No	274	66.7%

DISCUSSION

In the present community based study, prevalence of dental caries among adolescents was found to be 35.7%. In another study the prevalence of dental caries was found to be 33%, which was similar to the present study (Inamdar *et al.*, 2013). On the other hand, a study reported higher prevalence rate of dental caries (53.5%) for 11-15 years age group (Bhowate *et al.*, 1994). Another study also showed higher prevalence (53.18%) of dental caries (Goyal *et al.*, 1994).

In another study the overall prevalence of caries was found to be 63.20% (Dhar and Bhatnagar, 2009). This was in comparison to various prevalence studies done in rural India (Khera *et al.*, 1984; Gangwar *et al.*, 1990; Saha and Sarkar, 1996; Jayashree *et al.*, 2002).

The present study showed a higher prevalence of caries among boys as compared to girls. Similar observations of higher tooth decay in boys as compared to girls have been noted in rural areas of India in the previous studies also (Rao *et al.*, 1999; Saravanan *et al.*, 2008).

In the present study large number of the participants were illiterate and from poor socio economic background. Many other studies have attributed the high prevalence of oral disease and low level of oral health awareness to ignorance, poverty and lack of education (Otuyemi *et al.*, 1994; Enwonwu *et al.*, 1999).

In the present study it was found that use of finger as a cleaning aid was significantly associated with dental caries. A study reported that only 26.31% of subjects used toothbrush, which is similar to the present study (Bhowate *et al.*, 1994). Another study showed maximum prevalence of dental caries (72.38%) among those who used fingers for cleaning their teeth followed by datun users (67.5%) (Chakraborti *et al.*, 1997). A study reported that dental caries was less (46.63%) with brushing of teeth than other methods of cleaning (53.37%) (Goyal *et al.*, 1994). Similar results were also seen in other studies from Zambia (Noar and Portuoy, 1991).

The present study showed that the practice of not rinsing one's mouth after meals was associated with higher dental caries. This was statistically significant. Similar findings are reported from various other studies (Chakraborti *et al.*, 1997; Jayashree *et al.*, 2002).

Tobacco addiction of chewing and smoking was associated with higher incidence of dental caries. One of the main reasons for the association between smokeless tobacco and dental caries is the presence of high amount of various sugars and sweeteners added during the commercial manufacturing of smokeless tobacco products (Vellappally *et al.*, 2007). Individuals who chew tobacco appear to have more dental caries than non-users. Review of studies conducted from 1988–90 on oral consequences chewing tobacco use showed a significantly higher prevalence of root caries than did comparable sites in non-smokers (Robertson *et al.*, 1997).

In the present study it was found that those participants who cleaned their teeth twice had less tooth decay as compared to those who cleaned their teeth once. Similar findings were reported from another study (Jayashree *et al.*, 2002). Also, a study reported that the prevalence of dental caries was found to be low (31.46%) in children who cleaned their teeth twice a day than those who cleaned only once a day (68.81%) (Goyal *et al.*, 1994).

CONCLUSION AND RECOMMENDATIONS

Oral health is strongly related with frequency of mouth washing, type of cleaning aids and rinsing of mouth after meals. It is important that prevalence of caries in a given population is assessed at regular intervals of time to determine the spread of oral disease and the need to provide adequate preventive and restorative oral care. Such studies would thus help to make the population disease free. It is recommended that awareness among adolescents about oral health should be encouraged and oral hygiene of the whole population could be improved with the help of accessible and affordable oral health services.

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