

Oral Hygiene Practices and Factors Affecting Oral Health Service Utilization among Children (11–14 Years) of Government School of Nikol Ward of East Zone of Ahmedabad, Gujarat, India

Abstract

Context: Oral hygiene practices and factors affecting oral health service utilization among the children of 10–16 years of age play a vital role in achieving comprehensive dental care. **Aims:** This study was done to assess oral hygiene practices, creating oral hygiene awareness, and to analyze the overt hurdles in getting basic and timely dental care among children. **Materials and Methods:** It was a cross-sectional survey conducted among 200 schoolchildren aged 11–14 years using a pretested, semistructured questionnaire, and clinical examination was done to assess dental caries. Convenience sampling method was used, and the sample size for the study was equal to the total number of participants. The logistic regression analysis along with odds ratios with 95% confidence interval and $P < 0.05$ was also reported. Chi-square test was used for statistical analysis of dental caries prevalence. **Results:** Around 70% of the study participants had the habit of brushing their teeth once daily, whereas only 30% of them used to brush their teeth twice daily. The prevalence of dental caries shows an upward trend with increasing age from 11 to 14 years. Cost of dental treatment, transportation, and dental taboos followed by fear of dental treatment are the major constraints for the students in accessing dental treatment. **Conclusion:** School-based tooth brushing and oral health education programs should be regularly organized to promote healthy tooth brushing practices. The cost-effective and timely transportation services along with proper oral health education in alleviating fear of dental treatment and dental taboos should be provided to these children for enhancing the utilization of dental services.

Keywords: Cross-sectional survey, dental caries, oral hygiene practices, school children

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Introduction

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, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being.^[1] Oral health affects the general health, well-being, education, and development of children and their families.^[2]

Oral health has been neglected for long, especially in the low-income families. The limited knowledge about dental practices, attitude, oral health-related habits, and behavior are the leading causes for all the dental problems faced by the children.^[3]

Oral hygiene practices and factors affecting oral health service utilization among the

children of 10–16 years of age play a vital role in achieving comprehensive dental care.^[4] Having a poor oral hygiene can lead to a variety of dental and medical problems in future such as gum disease, infection, gingival recession, heart disease, strokes, and more. A correct oral hygiene routine right from childhood is what might help putting dental problems at bay.

More than 50 million school hours are lost annually because of oral health problems, which affect children's performance at school and success in later life. In a metropolitan city like Ahmedabad, no systematic assessment on the oral health problems is available, especially among children belonging to low socioeconomic class studying in government schools. Hence, the current study was planned among the children studying in suburban government school of Nikol area and

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predominantly from a low socioeconomic area, located in the field practice area with referral center of a teaching municipal corporation dental college. Furthermore, a large population in our country is not able to receive timely dental care due to several reasons, including unavailability of transportation services for reaching nearby affordable government dental colleges and hospitals, insufficient information regarding the need to maintain proper oral hygiene, and the lack of knowledge regarding government dental hospitals offering dental treatments at reasonable rates.^[5] There is a scarcity of epidemiological data on the representative urban population. Thus, the present study was undertaken on schoolchildren of low socioeconomic area of Ahmadabad city to find the prevalence of dental caries, oral hygiene practices, and the unmet need for oral health services by assessing the existing health-seeking behavior for these oral morbidities.

Aims and objectives

Aims

To assess oral hygiene practices, creating oral hygiene awareness, and to analyze the overt hurdles in getting basic and timely dental care among children (11–14 years) of government school of Nikol ward of East Zone of Ahmedabad, Gujarat, India.

Objectives

1. To analyze the oral hygiene practices among the school children (11–14 years)
2. To analyze the problems faced by the school children (11–14 years) in getting comprehensive dental treatment.

Materials and Methods

Study design and sampling

The proposed study was conducted among 200 students of 11–14 years of age group of the government school of Nikol ward of Ahmedabad, Gujarat, India. This age group was selected for the study, as it is a period of mixed dentition and a proper dental hygiene right from this age is critical in preventing the dental problems such as dental caries. In our study, this age group predominantly belongs to low socioeconomic status, and the utilization of dental services was hampered. This government school is located in the field practice area of Nikol urban health center, where weekly free dental checkup camps and health education programs are organized by a teaching municipal corporation dental college. This college is the ultimate referral center providing cost-effective dental treatment at affordable cost. Hence, this study was done in this age group of 11–14 years to analyze the problems of these children belonging to lower socioeconomic areas in utilization of cost-effective dental services of our teaching municipal corporation dental college as well as other private dental clinics in Nikol area. The study has a limited

budget and time period, which includes the children of age 10–14 years of government schools of Nikol ward who were willing to participate and present on the day of survey. For the equal and uniform representation, 50 students from each division were considered. Convenience sampling method was used, and the sample size for the study was equal to the total number of participants. The students were assessed individually by a team of three expert dental surgeons in their local language through a pretested, semistructured questionnaire consisting of multiple-choice questions, and clinical examination was also done for the same.

Ethical consent

Ethical approval for the study was obtained from the Institutional Ethical Review Board of AMC Dental College and Hospital for conducting the study. The ethical approval number of the study is AMC/IRB/32/27. Written consent for the study was also obtained from the principal of the school. Written permission from the Dean of AMC Dental College and Head of Department of Public Health Dentistry was also taken prior to the survey.

Time scale and place of the study

The survey was conducted by an expert team of three dental surgeons on September 26, 2017, at a government school of Nikol ward of Ahmedabad, Gujarat, India.

Selection criteria

Inclusion criteria

1. The participants belonging to the age group of 11–14 years were only selected for the study randomly, irrespective of sex, caste, religion, and etiology
2. The participants present on the day of survey were included
3. The participants signing assent form were only considered for the study
4. The participants willing to participate in the study were included by signing assent form
5. The participants with parent's/guardian's permission to participate in the study were included by signing consent form
6. The participants from the government school of Nikol ward of East Zone of Ahmedabad were only included in the study.

Exclusion criteria

1. The participants absent on the day of survey were excluded
2. The participants not willing to participate in the study and not signing informed assent form were excluded
3. The participant's parents/guardians not signing consent form were also excluded
4. The participants with any medical illness or any pathology in the oral cavity were also excluded from the survey.

Materials/equipment for the study

1. Informed assent/consent form (ICF)
2. A participant information sheet along with a structured questionnaire comprising 18 multiple-choice questions
3. Plain mouth mirror and probe to assess dental caries.

Method for collection of data

The proposed study was conducted at the government school of Nikol ward of East Zone of Ahmedabad city after taking due approval from the principal as well as concerned authorities at A.M.C. Dental College and Hospital, Khokhara, Ahmedabad. The school children predominantly consist of population from low socioeconomic class. A parent's meeting was called, the purpose of the study was explained to the parents, and their consent was taken. Following this, the day and date for the survey was finalized. The school authorities and students were informed beforehand regarding the date and time of the survey. A pretested, semistructured questionnaire consisting of multiple-choice questions was used for this survey, and clinical examination was done using a plain mouth mirror and probe by a team of three expert dental surgeons to assess dental caries. A total of 18 questions were employed regarding basic oral hygiene practices and oral health service utilization.

The participants were informed about the purpose of the study, in brief. The participants/parents/guardians were asked to sign the ICF. Then, they were interviewed personally after duly signing an assent and consent form by the participant and the parent/guardian, respectively. Next, the basic information of the participants was filled. After that, face-to-face interview of respondents was done using a pretested semistructured questionnaire in their local language, which includes multiple-choice questions. The clinical examination for dental caries was also done using a plain mouth mirror and probe by a team of three expert dental surgeons. Their responses were recorded and it took approximately 10 min to fill one questionnaire.

The collected data of each participant were then entered into the master chart in Microsoft Excel 2010. The statistical analysis was conducted using the Statistical Package for the Social Sciences software version 20 (IBM, Armonk, New York, USA). The logistic regression analysis was performed to assess the effect of various independent variables on the prevalence of dental caries. Odds ratios (ORs) with 95% confidence interval (CI) were also reported. For all tests, CI and *P* value were set at 95% and <0.05, respectively.

Results

A total of 200 students were enrolled in the present survey from the government school of Nikol ward of Ahmedabad, Gujarat, India. Of total, 50 (25%) students each belonged

to 11, 12, 13, and 14 years. Of this, 108 (54%) students were female and 92 (46%) students were male.

Oral hygiene practices, oral hygiene materials, and oral habits

Almost 100% of students clean their teeth, of which more than 90% of students use toothbrushes and around 7% use neem stick, finger, charcoal, etc., More than 90% of students use toothpaste and around 7% use toothpowder, salt, etc., Around 66%, 78%, 76%, and 74% clean their teeth once daily as opposed to only 28%, 18%, 22%, and 26% clean their teeth twice daily in age group of 11, 12, 13, and 14 years, respectively. Around 64%, 56%, 56%, and 46% of students change their brush when it is completely torn off, which is usually more than 6 months, whereas only 12%, 12%, 14%, and 10% of students only compulsorily change their brush once in 6 months in the age group of 11, 12, 13, and 14 years, respectively. Around 80%, 72%, 66%, and 56% of students use toothpick as interdental aids and almost negligible number of students use interdental brush in the age group of 11, 12, 13 and 14 years, respectively. Almost 74%, 86%, 86%, and 80% of students clean their tongue, of which 70%, 86%, 82%, and 72% of students use tongue cleaners for cleaning in the age group of 11, 12, 13, and 14 years, respectively. Almost 82%, 76%, 74%, and 74% of students rinse their mouth with water after eating in the age group of 11, 12, 13, and 14 years, respectively. Around 60%, 80%, 88%, and 80% do not have any foul odor and bleeding gums problems (for the last 6 months), in the age group of 11, 12, 13, and 14 years, respectively. Amongst the students, who are having bleeding problems or foul odor, a negligible number visits dentist or use mouthwash. Majority of students, around 74%, 68%, 66%, and 62% never visited a dentist before in the age group of 11, 12, 13, and 14 years, respectively, and those who have visited the dentist, it was for the specific dental problems. Majority of students do not have any kind of destructive oral habits such as tobacco and betel nut chewing and smoking.

Accessibility of dental treatment

Majority of them do not have knowledge or information regarding nearby dental clinics or hospitals. Most of them have attended governmental dental programs. Cost and transportation are the biggest hurdles for the students in accessing dental treatment in all age groups from 11 to 14 years. The dental taboos followed by fear of dental treatment are the major constraints for them in getting dental treatment in all the age groups from 11 to 14 years.

Prevalence of dental caries

The prevalence of dental caries was 38% that was maximum in the age group of 14 years, followed by 34%, 32%, and 26% in the age group of 13, 12, and 11 years, respectively [Table 1]. There was no association found between age and prevalence of dental caries (*P* > 0.05).

There is no association between age and prevalence of dental caries.

Logistic regression analysis

The logistic regression analysis was performed to assess the effect of various independent variables (age, usage of toothbrush and toothpaste, frequency of cleaning the tooth, etc.) on the presence and absence of dental caries. ORs were also generated. The odds of developing dental caries were 1.74 times higher in the age group of 14 years as compared to 11 years. Those using neem stick, finger, charcoal, etc., will develop dental caries 1.4 times higher as compare to those, who are using toothbrush for cleaning teeth. The prevalence of ORs for dental caries was 1.40 times higher in those who are using neem stick, finger, charcoal, etc., rather than toothbrush for cleaning teeth; 1.40 times higher in those who are using tooth powder, salt, etc., other than toothpaste for cleaning teeth; 1.35 times higher in those who are brushing once daily than those who are brushing twice daily; and 1.31 times higher in those who are brushing occasionally than those who are brushing twice a daily [Table 2].

Discussion

The government schools provide a platform for the promotion of health and oral health. Oral health care and hygiene is neglected in these students, and majority of students studying in government schools belong to lower socioeconomic status. Regular dental visits increase the probability of diagnosing and managing oral disease in their early stages, thereby limiting any significant damage to teeth and gums.^[6]

Poor oral hygiene can result in dental caries, gingivitis, periodontitis, tooth loss, bad breath (halitosis), fungal infections, and various gum diseases. The use of a toothbrush is the most important measure for oral hygiene.^[7] Although around 70% of the study participants used to clean their teeth once daily, very few participants, that is around 30% only, were brushing their teeth twice daily, which is in contrast to the reports of some other studies conducted on school children in Ambala, Haryana, where more than 90% of participants used to clean their teeth once daily and around 20% of participants were brushing twice daily.^[8] This can be due to the unawareness regarding importance of brushing at night or due to peer influence and lack of parental/professional support and education. However, numbers of participants using tree stick for cleaning their teeth were much higher (59%) in some other studies as compared to the present study, where only around 4% of participants only use neem stick, charcoal, etc., for cleaning teeth.^[8]

In the present study, the prevalence of dental caries was around 32% in the age group of 11–14 years. It ranges from 26% in the age group of 11 years up to 38% in age group of 14 years; this showed an upward trend with increasing

Table 1: Prevalence of dental caries

Age	Dental caries prevalence, n (%)	χ^2	P
11	13 (26)	1.7094	0.63
12	16 (32)		
13	17 (34)		
14	19 (38)		

Table 2: Multiple logistic regression analysis

Variable	OR	95% CI	P
Age			
11	1.00		
12	1.34	0.56-3.19	0.507
13	1.47	0.62-3.47	0.383
14	1.74	0.74-4.09	0.199
Tooth brush	1		
Others	1.40	0.23-8.57	0.717
Tooth paste	1		
Others	1.40	0.23-8.57	0.717
Occasionally	1.31	0.21-8.02	0.771
Once	1.35	0.65-2.78	0.416
Twice	1		

OR: Odds ratio; CI: Confidence interval

age from 11 to 14 years. In other study conducted on school children in Ambala, Haryana, the prevalence of dental caries was higher, which reveals 43.64%, that ranged from 34.3% (12 years) to 46.5% (15 years) that also showed an upward trend with increasing age.^[8] A higher prevalence was also found in a study conducted on school children in Chennai.^[9] Some other studies also reported similar prevalence.^[10,11] The cumulative nature of dental caries is responsible for the upward trend in ours study, as it remains untracked and unresolved at earlier ages like 11 years, hence it keeps on increasing at later ages up to 14 years. On the contrary, lower caries prevalence was reported in some other studies.^[12]

There were also limitations of this study. The small sample size and short age ranges (11–14 years) leading to nonsignificant ORs might have affected the outcome of the study. Source bias can be found here from the participants as some of them might have unknowingly answered just by guessing. The prevalence of dental caries may have been underestimated. The radiographs were not used for diagnosis of dental caries. The school authorities had provided limited time for conducting the survey as students were examined during the school hours, the detailed analysis of dental caries was not possible in children of age group from 11 to 14 years, and hence there is a scope for future study.

Conclusion

In our study, around 70% of the study participants used to clean their teeth once a day, and very few subjects, that is around 30% only, were brushing their teeth twice a day. School-based oral health education programs, fluoride

mouth rinse programs, and orally healthy school policies such as school dental checkup camps regularly can assist schools in improving the oral health of children and that will motivate them to access comprehensive dental care. Community/school and clinic-based programs such as oral health education, applying fluoride, placing dental sealants on teeth, and the professional cleaning of teeth can be effective, but these are resource intensive.^[13]

The existing oral health teaching manual should be revised as well as teachers should be trained on basic skills in oral hygiene, so as to include newer concepts of oral health care like tooth brushing twice a daily, cigarette smoking as a cause of oral cancer and importance of regular dental visits for maintaining good oral health.^[14] There is a need for increased collaboration between schools and departments of oral health services such as AMC Dental College Referral Center located near to the government school in our study to enhance compliance with oral hygiene practices among school children. Cost of dental treatment, transportation, and dental taboos followed by fear of dental treatment are the biggest hurdles for the students in accessing dental treatment in all age groups from 11 to 14 years. In our study, the children were from the government school having low socioeconomic strata, and the burden of untreated dental diseases and the cost of treatment add to the everyday challenges of these families. The cost-effective and timely transportation services and proper oral health education in alleviating fear of dental treatment and dental taboos should be provided to these children for enhancing the utilization of oral hygiene services. Further studies should be carried out to determine the knowledge and practice of schoolchildren's parents on oral hygiene practices.^[15]

The rate of attendance to dental clinic is very low despite the relatively high levels of knowledge regarding the importance of the regular dental visits. This hints at underlying problems, either with ease of availability of dental service or with just an overall negative attitude toward preventive measures. Either ways, further studies should be done to identify where the problem is.^[16] More than 50 million school hours is lost annually because of oral health problems that affect children's performance at school and success in later life.^[17] As rightly said, prevention is better than cure and oral health awareness education of the schoolchildren at this early age at large can make a huge difference.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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