Research Article

Prevalence of dental caries among school-going children in South India

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Abstract

Background: Dental caries is the most prevalent disease among children in the global scenario. The prevalence pattern of dental caries varies not only with age, sex, socioeconomic status, race, geographical location, food habits, and oral hygiene practices but also within the oral cavity.

Objective: The objectives of this research are to study the prevalence of dental caries and to study the factors associating dental caries among school children in urban field practice area.

Materials and Methods: This cross-sectional study was conducted in government and private schools of Maralur, the field practice area of Sri Siddhartha Medical College Tumkur, on children studying in preschool to 10th standard. The data were compiled in an Excel worksheet, SPSS version 16.0 was used to analyze the data.

Result: A total of 417 students participated in the study. In our study, the prevalence of dental caries was 32.9%. It was observed that highest dental caries prevalence was in the age group of 6–10 years, that is, 49.7%. Analysis showed very high significant difference in the prevalence of dental caries among different age groups ($P < 0.001$). The prevalence of dental caries among females was 34% and among males was 31.8%.

Conclusion: The high prevalence rate shows further follow-up and also awareness among teachers, parents, and students regarding dental caries and dental hygiene is needed. Awareness among students can be generated by the school teachers because they are the role model for the students.

KEY WORDS: Prevalence, dental caries, chocolate consumption, diet, mother's education

Introduction

Dental caries is the most prevalent disease among the children in the global scenario.[1] Dental caries can be tracked down to exist for a long time just as civilization.[2] In the developing countries such as India, changing life styles and dietary patterns are distinctly expanding caries incidence.[3] The prevalence of dental caries is found to be related to diet for ages. Oral health is an integral part of general health.[4] The incidence pattern of dental caries varies not only with age, sex, socioeconomic status, race, geographical location, food habits, and oral hygiene practices but also within the oral cavity.[5] Several studies about caries prevalence have been done in different parts of India, which show that there is an increase in caries prevalence among the school-going children. These studies help us not only to understand the severity and distribution of caries but also in planning appropriate preventive measures.

There is paucity of such data in the state, and the literature review does not reveal many such studies from our area. In view of addressing the demand for this need, this study was undertaken with the objectives to determine the prevalence of dental caries among the school-going children in Tumkur district, Karnataka, India, and the factors associating dental caries.

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Materials and Methods

This cross-sectional study was conducted in the government and private schools of Maralur, the field practice area of Sri Siddhartha Medical College Tumkur, Karnataka, India, on children studying in preschool to 10th standard. The study subjects were school children from preschool to high school of age 3–15 years. The study duration was from August 2013 to January 2014. The sample size was calculated based on 50% prevalence of caries, 10% allowable error, and 95% confidence interval.[6,7] To meet the study objectives, the sample size was estimated to be a minimum of 400 participants.

The lists of school were prepared according to the information supplied by the Directorate of education, Tumkur. There are eight schools in Maralur, the field practice area of Sri Siddhartha Medical College, Tumkur, of which four schools were selected randomly for the study—two each of the government and private schools. Consent was obtained from the school principal before the commencement of this study. 417 children were selected from the schools by purposive sampling. Their teeth were examined for caries by using torch. The children were made to sit in an ordinary chair in broad daylight facing away from the sunlight and examined in their respective schools. A pretested proforma was used for data collection, which included general information about the subject, chocolate consumption, brushing habits, mother's education, and the type of diet.

Statistical Analysis

Data were compiled in an Excel worksheet. The data were analyzed by using SPSS software, version 16.0. Descriptive statistics including frequency, percentage, mean, standard deviation, and χ^2-test, were used to observe the association between dental caries and other variables such as age, sex, religion, type of diet taken, chocolate consumption, and mother's education. A *P*-value less than 0.05 was considered statistically significant.

Result

In our study, 417 students of age 3–15 years were examined ranging from preschool up to high school situated in Maralur, urban field practice area of Sri Siddhartha Medical College, Tumkur. The mean age of the study population was 9.13 years with a standard deviation of 3.748 years.

Of the 417 students, the majority of the students, 169 (40.5%) of them belonged to the age group of 6–10 years, followed by 160 (38.4%) who belonged to the age group of 11–15 years, and 88 (21.1%) of them who belonged to the age group of 3–5 years. A total of 223 (53.5%) were male and 194 (46.5%) female students. A total of 247 (59.2%) students were Hindus and 170 (40.8%) Muslims. With relation to mother's education, the majority of mothers were educated up to middle school [i.e., 176 (42.2%)]. A total of 248 (59.5%) students consumed mixed diet and 169 (40.5%) vegetarian diet. A total of 389 (93.3%) students consumed chocolates whereas 28 (6.7%) students did not consume chocolates [Table 1]. In our study, the prevalence of dental caries was 32.9% (i.e., of the 417 students, 137 students presented with dental caries).

Table 2 shows that the highest prevalence of dental caries was in the age group of 6–10 years, (i.e., 49.7%, followed by 25.6% in the age group of 11–15 years, and 13.6% in the age group of 3–5 years). Statistical analysis using χ^2-test showed a very high significant difference in the prevalence of dental caries among different age groups ($P < 0.001$). The prevalence of dental caries among the female and male students was 34% and 31.8%, respectively. Apparently, a higher prevalence was seen in the female students, which was, however, not statistically significant ($P = 0.636$). The prevalence of dental caries among the Hindus and Muslims was 27.1% and 41.2%, respectively. Religion was found to be significantly associated with dental caries ($P = 0.003$). The prevalence of dental caries was high in students whose mother's education status was low; it was 50% among the students of the mothers who studied till primary school and 42.9% among the students of the mothers who were illiterates. Mother's education was found to be significantly associated with the prevalence of dental caries ($P = 0.031$) [Table 2].

On the basis of food consumed, the study showed that among the vegetarians, 25.4% developed caries; among those who consumed mixed food, 37.9% developed caries, and it was statistically significant ($P = 0.008$). So, there is a significant difference in the prevalence of dental caries among the vegetarians and those who consume mixed diet. Among the students who consumed chocolate, 34.2% developed caries; among those students, who did not consume chocolate, 14.3% developed caries, and chocolate consumption was significantly associated with the prevalence of dental caries ($P = 0.030$).

Discussion

This study shows that the prevalence of dental caries among the students was 32.9% and the highest prevalence of dental caries was in the age group of 6–10 years. Statistical analysis showed a very high significant difference in the prevalence of dental caries among the different age groups. Apparently, a higher prevalence was seen in the female students, and the same was not statistically significant. Religion was found to be significantly associated with dental caries, as it was high in the Muslims when compared with the Hindus. The prevalence of dental caries was high in students whose mother's education statuses were low, and mother's education was found to be significantly associated with the prevalence of dental caries. This study showed that there is a significant difference in the prevalence of dental caries among the vegetarians and those who consume mixed diet, which was high among those who take mixed diet, and chocolate consumption was significantly associated with the prevalence of dental caries.

Table 1: Sociodemographic characteristics and habits of the study population

Sociodemographic profile	Frequency	Percentage
Age (years)		
3–5	88	21.1
6–10	169	40.5
11–15	160	38.4
Sex		
Male	223	53.5
Female	194	46.5
Religion		
Hindu	247	59.2
Muslim	170	40.8
Mother's education		
Illiterate	21	5.0
Primary school	16	3.8
Middle school	176	42.2
High school	60	14.4
PUC (12th std.)	113	27.1
Degree	31	7.4
Diet		
Vegetarian	169	40.5
Mixed	248	59.5
Chocolate consumption		
Yes	389	93.3
No	28	6.7
Total	417	100.0

Table 2: Association between the sociodemographic characteristics and dental caries

Parameters	Dental caries			*P*
	Present, *N* (%)	Absent, *N* (%)	Total, *N* (%)	
Age (years)				
3–5	12 (13.6)	76 (86.4)	88 (100)	< 0.001
6–10	84 (49.7)	85 (50.3)	169 (100)	
11–15	41 (25.6)	119 (74.4)	160 (100)	
Sex				
Male	71 (31.8)	152 (68.2)	233 (100)	0.636
Female	66 (34.0)	128 (66.0)	194 (100)	
Religion				
Hindu	67 (27.1)	180 (72.9)	247 (100)	0.003
Muslim	70 (41.2)	100 (58.8)	170 (100)	
Mother's education				
Illiterate	9 (42.9)	12 (57.1)	21 (100)	0.031
Primary school	8 (50.0)	8 (50.0)	16 (100)	
Middle school	69 (39.2)	107 (60.8)	176 (100)	
High school	14 (23.3)	46 (76.7)	60 (100)	
PUC (12th std.)	30 (26.5)	83 (73.5)	113 (100)	
Degree	7 (32.9)	24 (77.4)	31 (100)	

The higher prevalence of dental caries among the children could be owing to lack of parental awareness/prioritization for care, affordability issues, issues of child neglect, and so on. The results are in concurrence with the studies reported by de Almeida et al.[8] and Mahesh Kumar et al.[9] and contradictory to the study done by Adekoya-Sofowora et al.[10] The higher prevalence of dental caries among the female students might be attributed to an early eruption of teeth among them and, hence, presenting a longer period of exposure of teeth to the oral environment when compared with male students.[11,12] Similar results have been reported by several other authors,[13–16] while a low prevalence in females have been reported by Yee and McDonald[17] and Dhar et al in their studies.[7]

A similar study carried out among the primary school children in the age group of 3–12 years in Kerala showed that the prevalence of dental caries for all age groups combined to be 68.5%, which was a little high than our study; the reason for high dental caries may be owing to a high intake of mixed diet in Kerala. Association of the prevalence of caries with study variables such as sociodemographic factors, showed statistically significant results.[1] Similar results were obtained in an epidemiological study with an overall prevalence of caries (46.75%) and, among girls, it was 45.26%.[7] Similar results obtained in a prevalent study of dental caries conducted in Haryana showed that there was 39.4% prevalence of caries in the population, which significantly increased with age.[18] Dixit et al.[19] conducted a study among the school children, and they found that the prevalence of dental caries among the school children aged 12–13 years was 41%, where the prevalence was a little high when compared with our study. Gathecha et al.[20] revealed that the difference of prevalence of dental caries between the boys and girls are not significant, which coincides with our study.

In this study, efforts were taken to include many factors that influence the prevalence of dental caries such as mother's education, type of diet, and chocolate consumption. Limitations of this study were that we conducted the study without taking into effect the different variables, which affect the prevalence and progression of dental caries among children such as fluoride content of the drinking water, consumption of sugars, method of cleansing and the material used for this purpose, socioeconomic status of the parents, and visit to the dentist.

Conclusion

The high prevalence rate shows that further follow-up and awareness among the teachers, parents, and students regarding dental caries and dental hygiene is needed. Further studies are required to correlate the prevalence of dental caries in the target population with other sociobehavioral factors.

Dental caries is not only a medical problem but also a social problem. Awareness among the students can be generated by the school teachers, because they are the role models for the students. Parents should be aware of the dental health of their children. Parents and teacher meetings should be regularly organized, during which the parents are educated on the importance of good hygiene practices in disease prevention. Health education should be incorporated within the regular activities of the school. Overall education, particularly, female education can help to solve the problems in future.

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