

Original Research Article

Dental caries and oral hygiene practices among school children in Chennai, India: a cross sectional study

Shanthi Ramesh*, S. Sundari

Department of Pediatrics, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

Received: 06 May 2019

Revised: 16 July 2019

Accepted: 29 July 2019

*Correspondence:

Dr. Shanthi Ramesh,

E-mail: drshanthiramesh@gmail.com

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ABSTRACT

Background: Dental caries is commonly seen among school children. The World Health Organization has stated it to be one of the leading non-communicable diseases. Objective: To study the prevalence of dental caries among school children and to study the oral hygiene practices in the occurrence of dental caries.

Methods: This cross-sectional study included 307 school children aged 10-15 years. Each child was asked about the dental hygiene practices and was examined for the presence of caries.

Results: The prevalence of dental caries among school children was found to be 48.9 % with the 95% CI of 43.3% - 54.4%. The prevalence of dental caries was high among children 10-12 years of age 95(53.6%) compared to 55 (42.3%) among children in the age group of 13-15 years ($p=0.05$). Daily sweet consumption was significantly associated with a higher prevalence 40 (63.5%) of dental caries ($p=0.01$). Children not consuming vegetables and fruits everyday had a higher prevalence 76.5% dental caries ($p = 0.03$). Children who are not practicing night brushing had a higher prevalence of 112 (52.8%) of caries ($p=0.04$). The study showed that only 17.3% of the children visited a dental health care service.

Conclusion: Authors found the prevalence of dental caries to be high. Health education regarding the importance of good oral hygiene practices such as night brushing, diet modification and periodic dental visits to all the school children will play a major role in the prevention of dental caries.

Keywords: Dental caries, Oral hygiene practices, Prevalence, School children

INTRODUCTION

Dental caries is commonly seen among school children. Dental caries is the most widespread non-communicable disease, which needs immediate attention.¹ Oral health is an integral part of general health. In the long run, dental caries can result in frequent school absenteeism. Globally, it has been estimated that 60 to 90% of school children have dental caries.² The prevalence of dental caries has decreased in many developed countries over the past three decades³ but it still remains highly

prevalent in most of the developing countries.^{4,5} In India, the earliest references of dental caries dates to 1939, with studies done among the children of the Kangra valley, Punjab.⁶ Thereafter, a few prevalence studies have been conducted in various parts of the country. The pooled prevalence of dental caries among Indian children over the past 25 years was reported to be 56.7%.⁷ Dental caries can be prevented by simple, cost-effective interventions at the individual and community level. Hence, this study was undertaken to determine the prevalence of dental caries among school going children and to study the oral

hygiene practices on the occurrence of dental caries. This information will guide us in the implementation of preventive oral health programs in schools. This in turn will go a long way in improving the oral health as well as the general health of the children.

METHODS

This was a cross-sectional study which included 307 school children aged 10-15 years. The present study was conducted in a school in Perambur which comes under Chennai Corporation Zone III over a 3 month period from January to March 2018. The children were studying in standard VI to X.

A review of the literature showed that the prevalence of dental caries varied from 50 to 70% among school-going children in Tamil Nadu.^{8,9} Considering the prevalence rate of dental caries to be 60% with a type I error of 5% and the power of the study to be 80%, the sample size was calculated to be 307 children.

Inclusion and Exclusion criteria

School children who had completed 10 and 15 years of age and who were present on the day of the examination were included in the study. Children with any systemic illness and whose parents / guardians refused to participate were excluded from the study.

A pre-structured questionnaire based on socio-demographic details and oral hygiene habits was used for data collection. Dental examination of the children was performed in the school premises under adequate natural light. Each child was examined to look for the presence of caries using the DMFT index. The decayed, missing, and filled teeth (DMFT) index is one of the most widely used methods in oral epidemiology for assessing dental caries prevalence. The Institutional Ethical committee approval was obtained. Consent from the concerned school authorities and from the parents were also obtained.

Statistical analysis

Data analysis was done using SPSS version 16. Statistics including frequency, percentage, mean, 95% CI were done. Chi square test and odds ratio were estimated to observe the association between dental caries and other variables. A p-value less than 0.05 was considered statistically significant.

RESULTS

Socio-demographic Characteristics and Oral Hygiene Habits

A total of 307 school children aged 10 to 15 years were included in the study. Their mean age was 12.4 years±

1.36 years. In the present study, 51.1% (157) were boys and 48.9% (150) were girls.

In the present study, it was found that 98.1% of the children were using a brush for dental cleaning and only 1.9% were cleaning their teeth with their hands. Among the study population, 20.5% had sweets daily and only 5.5% children gave history of eating vegetables and fruits every day. It was found that only 30.9% of the children brushed their teeth before going to bed in the night. Regarding dental care visits, only 17.3% of the children had been to a dental health checkup. The details are in Table 1.

Table 1: Socio-demographic characteristics and oral habits.

Characteristics	Frequency	Percentage
Age (years)		
10 - 12	177	57.7
13 - 15	130	42.3
Sex		
Male	157	51.1
Female	150	48.9
Using brush		
Yes	301	98.1
No	6	1.9
H/o eating sweets (daily)		
Yes	63	20.5
No	244	79.5
H/o eating vegetables/ fruits (daily)		
Yes	17	5.5
No	290	94.5
Night brushing		
Yes	95	30.9
No	212	69.1
Dental checkup		
Yes	53	17.3
No	254	82.7

The Prevalence of Dental Caries

It was found that 150 out of the 307 children had dental caries. The overall prevalence of dental caries was 48.9% (95% CI: 43.3% - 54.4%). Out of the 150 children with caries, 255 (83.1%) had decayed teeth, 36 (11.7%) had filled teeth and 16 (5.2%) had missing teeth.

The prevalence of dental caries was 53.6% (95) among children aged 10-12 years compared to 42.3% (55) among children aged 13-15 years. The difference in the prevalence of caries among the different age groups was found to be statistically significant (p=0.05). The details are given in Table 2.

Table 2: Prevalence of dental caries among the different age groups.

Age (years)	Dental caries		Total	X2	p
	Present (%)	Absent (%)			
10 - 12	95 (53.6)	82(46.4)	177(57.7)	3.87	0.05
13 - 15	55 (42.3)	75 (57.7)	130 (42.3)		

Association between oral hygiene habits & Dental caries

In the present study, it was found that children who consumed sweets almost every day had a 2.1 times higher prevalence of caries than children who took sweets occasionally. The association daily sweet consumption and dental caries was found to be statistically significant (OR 2.1, 95% CI 1.2-3.8, p = 0.01).

It was found that children who did not include vegetables and fruits in their diet every day had a higher prevalence caries 76.5% as compared to children who took them daily 47.2% . It was found that children who did not include vegetables and fruits in their diet every day had a 3.6 times higher prevalence of caries than children who

took them daily. The association between not including vegetables and fruits in their diet every day and dental caries was found to be statistically significant (OR 3.6, 95% CI 1.2-11.4, p=0.03).

It was found that children who did not practice night brushing had a 1.7 times higher prevalence of caries than children who brushed their teeth before going to bed at night. The association between not practicing night brushing and dental caries was found to be statistically significant(OR 1.7, 95% CI 1.03-2.75, p=0.04). The study showed that only 17.3% of the children visited a dental health care service. It was found that there was no significant association between visiting a dental health care service and the occurrence of dental caries. The details are given in Table 3.

Table 3: Association between oral hygiene habits and dental caries.

Particulars	Dental caries		Odds ratio	95% CI	p value
	Yes n (%)	No n (%)			
H/o eating sweets (daily)					
Yes	40 (63.5)	23 (36.5)	2.1	1.2-3.8	0.01
No	110 (45.1)	134 (54.9)			
H/o vegetables/ fruits eating (daily)					
No	13 (76.5)	4 (23.5)	3.6	1.2 to 11.4	0.03
Yes	137 (47.2)	153 (52.8)			
Night brushing					
No	112 (52.8)	100 (47.2)	1.7	1.03-2.75	0.04
Yes	38 (40)	57 (60)			
Dental check up					
No	121(47.6)	133 (52.4)	0.8	0.4-1.4	0.3
Yes	29 (54.7)	24 (45.3)			

DISCUSSION

In the present study, the overall prevalence of dental caries was found to be 48.9% (95% CI: 43.3% - 54.4%). 65.6% of school children had dental caries in Nellore district.¹⁰ Found the prevalence of dental caries to be 78.3% among school children aged 9-13 years in Mumbai.¹¹ Similar observations were made in the study from Bharatpur city, Rajasthan.¹² The study by Saravanan

et al from rural Tamil Nadu showed a lower caries prevalence of 27% in the age group of 5 to 10 years.¹³

Authors observed the prevalence of dental caries to be high (53.6%) among the children aged 10-12 years compared to 42.3% among the children aged 13-15 years.

Similar observations were made in the studies.^{8,14} The reason suggested for decrease in dental caries prevalence

in the older children was the increase in the level of manual dexterity resulting in improved oral hygiene and also the increased awareness amongst them regarding oral health and hygiene.

The recent WHO guidelines recommend a reduction in the intake of free sugars to less than 5% of total energy intake to reduce the risk of dental caries.¹⁵ Dental caries is caused by the interaction of oral bacteria, mainly *Streptococcus mutans*, and dietary carbohydrates on tooth enamel. The bacterial fermentation of the dietary sugars produces organic acids that reduce the oral pH. This results in demineralization, progressive loss of the teeth enamel and cavitations of the teeth.⁴ Accordingly, in the present study, it was found that children who consumed sweets every day had a higher prevalence of caries 63.5%. Similar observations were made in the studies.^{11,16}

Authors observed that children who did not take vegetables and fruits daily had a high prevalence dental caries 76.5%. This is in concurrence with the study done by Mobley et al.¹⁶

Tooth brushing is a habit that should be taught to children when they are young and it is difficult to change in later life. In the present study, it was found that children who did not practice night brushing had a 1.7 times higher prevalence of caries than children who brushed their teeth before going to bed at night. It is suggested that younger children need supervised tooth brushing twice a day to prevent caries.²

Authors found that 82.7% children never visited a dentist health care service. Similarly, the study from Nepal reported that 93% of the children having never visited a dental care service.¹⁷ Regular dental checkup and good oral hygiene practices reduced the incidence of dental caries.¹⁸

CONCLUSION

Good dental health is essential for maintaining overall nutrition and general health. In the present study, the prevalence of dental caries was found to be high among school children. The study also highlighted that children who consumed sweets daily, not having vegetables and fruits every day and not practicing night brushing had a higher prevalence of dental caries. Health education regarding the importance of maintaining good dental hygiene and following proper oral hygiene practices such as night brushing, diet modification with an increased intake of vegetables and fruits with a reduction of sugar consumption and periodic dental visits to all the school children will play a major role in the prevention of dental caries.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Ramesh S, S. Sundari. Dental caries and oral hygiene practices among school children in Chennai, India: a cross sectional study. *Int J Contemp Pediatr* 2019;6:2032-6.