

A cross sectional study of oral health problems of primary school children with special emphasis on dental caries in an urban area of Pune city.

¹Dr. Atul A. Jagtap, M.D. Community Medicine, Assistant Professor, Department of Community Medicine, RCSM Govt. Medical College, Kolhapur, Maharashtra.

²Dr. Muralidhar P. Tambe, M.D. Community Medicine, Professor & HOD, Department of Community Medicine, B.J. Govt. Medical College, Pune, Maharashtra

³Dr. Varsharani V. Kendre, M.D. Community Medicine, Associate professor, Department of Community Medicine, B.J. Govt. Medical College, Pune, Maharashtra.

Corresponding Author: Dr. Atul A. Jagtap, M.D. Community Medicine, Assistant Professor, Department of Community Medicine, RCSM Govt. Medical College, Kolhapur, Maharashtra.

How to citation this article: Dr. Atul A. Jagtap, Dr. Muralidhar P. Tambe, Dr. Varsharani V. Kendre, “A cross sectional study of oral health problems of primary school children with special emphasis on dental caries in an urban area of Pune city”, IJMACR- November – December - 2022, Vol – 5, Issue - 6, P. No. 287 – 292.

Copyright: © 2022, Dr. Atul A. Jagtap, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License 4.0. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Oral diseases are one of the most common public health problems in all age groups but particularly it affects school going children more. Dental health is not only related to the health status of school children but also to their psychosocial wellbeing and school performance. Our objective was to evaluate various oral health problems among school children & oral health behavior associated with it and also to give recent estimate of prevalence of dental caries by using DMFT & DMFS indices.

Material and Method: A cross sectional study with primary school children of age 6 to 12 years from Pune city satisfying inclusion criteria were taken up for the

study. Dental examination was carried out using dental probe and torch with a child sitting in a chair.

Results: Majority (78.6%) children have brushing frequency of one time. 93.9% children have habit of eating sweets & majority of them has a habit of eating all the days of the week. In our study, as per DMFT index, 73.79% of school children were suffering from caries teeth. Only brushing frequency <2, habit of drinking milk with sugar & eating sweets at bedtime significantly associated with dental caries ($p < 0.05$). Mean DMFT index was 4.1 while mean DMFS index was 8.7.

Conclusion: We have found high prevalence of caries teeth in temporary as well as permanent dentition with

the mean DMFT index was 4.1 while mean DMFS index was 8.7.

Keywords: Primary school children, Oral health, dental caries, DMFT, DMFS.

Introduction

Oral diseases are one of the most common public health problems in all age groups but particularly it affects school going children more.¹ It can affect the people causing pain, discomfort, disfigurement etc.² The Global Burden of Disease Study 2016 estimated that oral diseases affected 3.58 billion people i.e. about half of the world's population with dental caries (cavities) being the most prevalent condition assessed.^{3,4}

Cavities results when microbial biofilm (plaque) is formed on surface of the teeth converts the free sugars of foods and drinks into acids which dissolve enamel and dentine over time.⁵ Further the dental treatment is very costly, accounting for 20% of out-of-pocket health expenditure in most of the developed countries. The oral health care demands are beyond the capacities of the health care systems in most developing countries.

Behavioral risk factors for oral diseases are an unhealthy diet, diet containing high free sugars, poor oral hygiene and inadequate exposure to fluoride, inadequate intake of fruits etc. Dental health is not only related to the health status of school children but also to their psychosocial wellbeing and school performance.⁶⁻¹⁰ Owing to changes in dietary practices in recent decades prevalence of oral diseases changed drastically at global level.^{11,12}

We have found that many of the studies conducted on schoolchildren enrolled in government school but there are very few studies in school children from private school hence we have planned this study in private schools with the objective to evaluate various oral health

problems among school children & oral health behavior associated with it and also to give recent estimate of prevalence of dental caries by calculating DMFT & DMFS indices.

Methodology

The present study was conducted to ascertain the prevalence of dental caries among primary school children of age 6 to 12 years from Pune city. Approval for the study was obtained before the start of study from institutional ethics committee. Study was carried out over a period of three months from March to May 2020. One of the private schools was selected using non-probability purposive sampling technique satisfying the sample size. Primary school children of 6-12 years with their parent/guardian consent for participation in the study were included in the study. School children remained absent on the day of examination were excluded. Written approval has been sought from the principal of the school before the study. Also written informed consent was obtained from the parent/guardian of school children and inform assent from school children more than 7years. Demographic information such as name, age, gender, and class will be collected followed by clinical examination for dental caries & recorded on a pre-structured proforma. Dental examination was carried out using dental probe and torch with a child sitting in a chair. Prevalence of dental caries was calculated by decayed, missing, filled teeth (DMFT) index, decayed, missing, filled surfaces (DMFS) index and DFT index. Number of decayed, missing, filling teeth of every child counted & finally Mean was calculated to obtain DMFT index. Similarly, for DMFS, total number of decayed, missing and filling tooth surfaces were counted and mean was taken to calculate the index. A pilot study was conducted on a

convenient sample of fifty, the prevalence of dental caries was assessed, and it was found to 31%. Based on this, the sample size was decided with $n = [DEFF * Np(1-p)] / [(d^2 / Z^2_{1-\alpha/2} * (N-1) + p*(1-p)]$ using OPENEPI software version 3 with 95% confidence interval & 10% absolute precision. Sample size came out to be 329. The final sample was rounded to 2 Data was entered and analyzed using excel.

Results

In the present cross-sectional study assessing the oral health, we have analyzed total 332 primary school children from grade 1 to grade 4. We have divided these children into two age groups. 167 (50.31%) were from the 6-9 years age group & 165 (49.69%) from 9-12 years age group. 173 (52.11%) were male & 157 (47.29%) were female children. Majority i.e. 261 (78.6%) children have brushing frequency of one time & most (96.7%) were using fluoridated toothpaste & toothbrush for brushing. Other methods were brushing with toothpowder, salt & water. 306 (93.9%) children have habit of eating sweets & majority i.e. 83 (25.5%) of them has a habit of eating all the days of the week while 32 (10.45%) of these eating sweets at bedtime. 174 (53.4%) children were drinking milk with sugar & 109 (33.3%) taking milk at bedtime. (Table 1)

Table 1: Distribution of primary school children according to some baseline variables.

Variable	Subcategory	No.	Percentage
Age Group	6-9	245	73.80
	>9-12	87	26.20
Gender	Male	173	52.11
	Female	159	47.89
Frequency of brushing	Not brushing	3	0.90
	Once	261	78.60

teeth	Twice	66	19.90
	Thrice	2	0.60
Method of cleaning of teeth	With fluoridated toothpaste & toothbrush	321	96.70
	With toothpowder	6	1.80
	With water only	2	0.60
	With salt	3	0.90
Habit of eating sweets	Yes	306	93.90
Frequency of eating sweets in a week (n=306)	1-3	87	28.43
	4-6	136	44.44
	≥7	83	27.12
Habit of drinking milk at bedtime	Yes	109	33.30
Habit of drinking milk with sugar	Yes	174	53.40
Habit of eating sweets at bedtime	Yes	32	10.45

In our study, as per DMFT index, 245 (73.79%) of the 332 children were suffering from caries teeth. 181 (73.87%) children in 6-9 years of age group & 64 (73.56%) in 9-12 years of age group were having dental caries. Dental caries association with baseline variables have demonstrated that only brushing frequency <2,

habit of drinking milk with sugar & eating sweets at bedtime significantly associated with dental caries ($p < 0.05$) while age, gender, method of cleaning of teeth, habit of eating sweets, frequency of sweets/week & habit of drinking milk at bedtime were not associated significantly with dental caries ($p > 0.05$). (Table 2)

Table 2: Association of dental caries (DMFT+) with baseline variables among primary school children.

Variable	Subcategory	Dental caries		P value
		No.	(%)	
Age Group	6-9 (n=245)	181	73.87	0.95
	>9-12 (n=87)	64	73.56	
Gender	Male (n=173)	133	76.88	0.18
	Female (n=159)	112	70.44	
Frequency of brushing teeth	<2 (n=264)	211	79.92	<0.001
	>2 (n=68)	34	50	
Method of cleaning of teeth	With fluoridated toothpaste & toothbrush (n=321)	238	74.14	0.19
	With toothpowder (n=06)	05	83.33	
	With water only (n=02)	01	50	
	With salt (n=03)	01	66.67	
Habit of eating sweets	Yes (n=306)	228	74.51	0.3
	No (n=26)	17	65.38	
Frequency of eating	1-3 (n=87)	60	68.97	0.28
	4-6 (n=136)	102	75	

sweets in a week (n=306)	≥ 7 (n=83)	66	79.52	
Habit of drinking milk at bedtime	Yes (n=109)	78	71.56	0.56
	No (n=135)	101	74.81	
Habit of drinking milk with sugar	Yes (n=174)	104	59.77	0.03
	No (n=70)	52	74.29	
Habit of eating sweets at bedtime	Yes (n=32)	29	90.63	0.02
	No (n=274)	199	72.63	

On oral examination, we found cavities in 242 (72.9%) children, missing teeth in 138 (41.6%), mottling among 46 (13.9%) & filling in 10 (3%) (Chart 1). Gums were healthy in 99.1% (Chart 2) but overall oral hygiene was good only in 34.6% study subjects (Chart 3).

Chart 1: Oral examination findings for teeth.

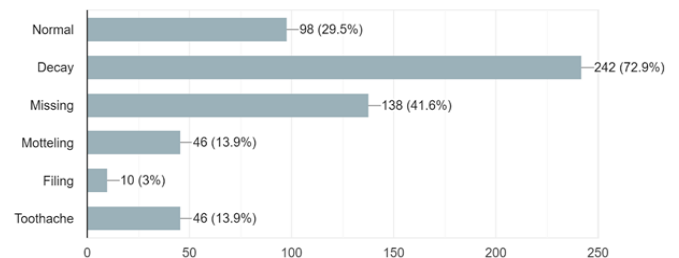


Chart 2: Oral examination findings for gums.

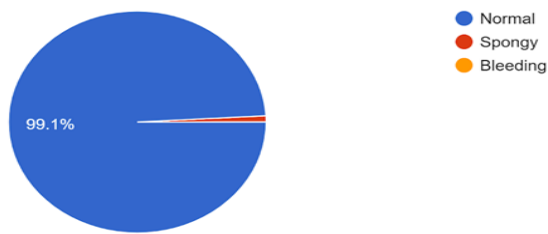
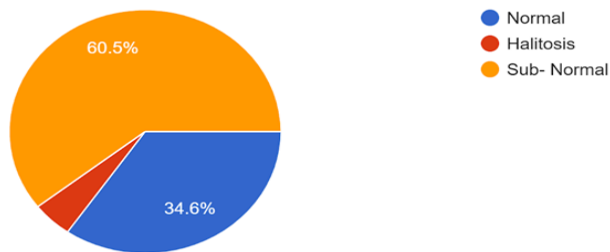


Chart 3: Oral examination findings for overall oral hygiene.



Mean number of decayed teeth in our study were 3.2, mean number of missing teeth were 0.9, mean number of filled teeth were 0.1. Mean DMFT index was 4.1 while mean DMFS index was 8.7. (Table 3)

Table 3: Mean DMFT and DMFS indices of primary school children.

Mean no. of decayed teeth	Mean no. of missing teeth	Mean no. of filling teeth	Mean DMFT	Mean DMFS
3.2	0.9	0.1	4.1	8.7

Discussion

Present cross-sectional study assessing the oral health was conducted among 6-12 years primary school children which is the period of mixed dentition. 167 (50.31%) children were from the 6-9 years age group which is period of mainly primary dentition & 165

(49.69%) from 9-12 years age group which is period of mainly permanent dentition. 52.11% were male & 47.89% were female children. Majority children have brushing frequency of one time & most were using fluoridated toothpaste & toothbrush for brushing. 93.9% children have habit of eating sweets & majority of these has a frequency of 4-6 times/week while least of these have a habit of eating all the days of the week. 10.45% were eating sweets at bedtime. 53.4% children were drinking milk with sugar & 33.3% of these were taking milk at bedtime. Findings are consistent with Thakur, et al.¹³, Naziya, et al¹⁴.

In our study, as per DMFT index, Overall prevalence of caries teeth was 73.79%. Prevalence of dental caries in 6-9 years of age group of children was 73.87% & 73.56% in 9-12 years. Dental caries associated with oral behavior of brushing frequency <2, habit of drinking milk with sugar & eating sweets at bedtime ($p < 0.05$) while method of cleaning of teeth, habit of eating sweets, frequency of sweets/week & habit of drinking milk at bedtime were not associated significantly with dental caries ($p > 0.05$). Thakur, et al¹³ also found that brushing frequency <2 was significantly associated with dental caries, but in contrast to our study they found significance for method of cleaning & material used for cleaning which were protective against caries. Rekha S. Sona vane et al¹⁵ in their study noted significant association of oral problems with frequency of brushing. Mean DMFT index was 4.1 while mean DMFS index was 8.7. Similarly, Reddy, et al¹⁶ observed prevalence of caries in both primary dentition and permanent dentition was 64.2% and 26.6%, respectively. Overall, mean dmft score of both males and females is 1.49 ± 1.56 for temporary dentition, the overall mean DMFT score of both males and females is 0.57 ± 1.23 for permanent

dentition. Bennadi, et al¹⁷ reported mean DMFT was 1.34 ± 1.42 in permanent teeth & In deciduous dentition, the mean dmft was 2.03 ± 1.61 , decayed component of DMFT was common. In our study also decayed component of DMFT was common. In contrast to our study, Naziya, et al¹⁴ reported lower (0.27 ± 0.67) DMFT scores among 6-12 years children.

Conclusion

According to DMFT index, prevalence of caries teeth in private school was 73.79%. We have found high prevalence of caries teeth in temporary as well as permanent dentition. Dental caries was associated with oral behavior of brushing frequency <2 times a day, habit of drinking milk with sugar & eating sweets at bedtime but not associated with method of cleaning of teeth, habit of eating sweets, frequency of sweets/week & habit of drinking milk at bedtime. Mean DMFT index was 4.1 while mean DMFS index was 8.7.

References

1. Petersen PE. The World Oral Health Report: Continuous improvement of oral health in the 21st century-The approach of the World Health Organization Global Oral Health Programmer. *Community Dent Oral Epidemiol* 2003; 31 Suppl 1:3-23.
2. Jackson et al. Impact of Poor Oral Health on Children's School Attendance and Performance. *Am J Public Health* 2011; 101: 1900-6.
3. World Health Organization. 2017. "What Is the Burden of Oral Disease?" [http:// www. who. int/ oral _ health/ disease_ burden/global/en](http://www.who.int/oral_health/disease_burden/global/en).
4. Marcene's, W., N. J. Kassebaum, E. Bernabe, A. Flaxman, M. Naghavi, A. Lopez, and C. J. L. Murray. 2013. "Global Burden of Oral Conditions in 1990–2010: A Systematic Analysis." *Journal of Dentistry Research* 92 (7): 592–597.
5. Bhatia HP, Srivastava B, Khatri S, Aggarwal A, Singh AK, Gupta N. Prevalence of dental caries among 3-15 old school children in Ghaziabad city and its adjoining areas – A correlated survey. *J Oral Health Community Dent* 2012; 6: 135-9.
6. Saxena S, Shashi Kiran ND. Prevalence of dental caries and treatment needs among hemophilic children of Kota city, Rajasthan. *Ann Essences Dent* 2010; 2: 18-21.
7. Lukacs JR, Largaespada LL. Explaining sex differences in dental caries prevalence: Saliva, hormones, and "life-history" etiologies. *Am J Hum Biol* 2006; 18: 540-55.
8. Fabrizio F, Stanislao FD, Lemma P, Renga G. Role of social class in caries occurrence in 12-year-olds in Turin, Italy. *Eur J Public Health* 1999; 9: 109-13.
9. Doifode VV, Ambedkar NN, Lane war AG. Assessment of oral health status and its association with some epidemiological factors in population of Nagpur, India. *Indian J Med Sci* 2000; 54: 261-9.
10. Adekoya-Sofowora CA, Nasir WO, Oginni AO, Taiwo M. Dental caries in 12-year-old suburban Nigerian school children. *Afr Health Sci* 2006; 6: 145-50.
11. Lundstrom F. Systematic plaque control in children undergoing long-term orthodontic treatment. *Eur J Orthod* 1980; 2: 27-39.
12. Tani DQ. Relationship of socio-economic background to oral hygiene, gingival status, and dental caries in children. *Quintessence Int* 2002; 33: 195-8.
13. Thakur A, Acharya S, Singhal D, Rewal N, Bhardwaj V. Oral health status and oral health behaviors of 12-year-old urban and rural school children in Udupi, Karnataka, India: A cross-sectional study. *J Dent Allied Sci.* 2017; 6(1): 12.

14. Naziya KB, Pradeep Kumar R, Meignana Arumugham I, Sri Sakthi D. Prevalence of dental caries among primary schoolchildren in Chennai - A cross-sectional study. *J Adv Pharm Educ Res.* 2017; 7(2): 150–1.
15. Sona vane RS, Jargar JG, A SJM, Ko sandal K, I MTK. Prevalence of Oral Health Problems Among School Children in Bijapur, Karnataka. *J Evol Med Dent Sci.* 2014; 3(38): 9727–34.
16. Reddy K, Reddy S, Ravin Dhar P, Balaji K, Reddy H, Reddy A. Prevalence of dental caries among 6–12 years school children of Mahbubnagar District, Telangana State, India: A cross-sectional study. *Indian J Dent Sci.* 2017; 9 (1): 1.
17. Bennadi D, Shaban am S, Abdul Nn, Jacob A, Malini K, Bharateesh J. Oral health status of orphanage children, Tumkur: A survey report. *Int J Community Dent.* 2018; 6(2): 27.