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Original Research Article

Awareness of dental hygiene amongst the primary school children of low socio-economic strata

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ABSTRACT

Background: Childhood dental caries is a major health concern in children that continues to negatively affect the oral health. The condition if left untreated, can lead to disruption of growth and development of permanent teeth, pain, life threatening infections and expensive treatment. This study was done to assess the prevalence of the dental caries in primary school children and see their current level of awareness about dental hygiene practices.
Methods: The present study was questionnaire-based cross sectional study. During the study 1000 school students of age 5-12 years were interviewed personally about the dental hygiene practices. The questionnaires were filled as per the responses given by them and after that basic dental and oral examination was carried out, to look for the condition of teeth, number of carious teeth in the mouth, number of restorations etc. Only one student was interviewed and examined at a time. After that he or she was provided with basic information to maintain good oral and dental hygiene.
Results: The prevalence of dental caries is 31.6% and of these 4.43% had carries in more than 3 teeth. 60 children had at least one teeth restored. Only 16.3% children were totally aware of the dental hygiene. About 61.7% of them brush in morning, and only 30.4% for more than 2 minutes. 52.3% had never visited a dentist.
Conclusions: Most of the children are not totally aware of the ways to maintain good oral hygiene and those who are aware are not practicing it. The role of parents is also very significant but nearly half of the parents do not guide their children for brushing and maintaining good oral hygiene. Regular dental check-ups by arranging dental camps in schools and educating the children and parents about oral hygiene will improve the situation.

Keywords: Dental caries, Low socio-economic status, Oral hygiene practices, Pre-school children

INTRODUCTION

Dental caries is considered, the most common ignored chronic disease among children.[1] About 40% of preschool children have dental caries by 5 years age.[2,3] It is a multifactorial disease and amongst all known risk factors for caries, dietary causes are the most important especially, high sugary and starchy food, popular colas and sugar filled fizzy drink and a high number of cariogenic microorganisms such as Streptococcus mutans, lactobacillus- that metabolize sugars to produce acid which, over time, demineralizes tooth structure. Other causes like fluoride content of the water, daily food habits, and parental knowledge, especially of the mother regarding daily oral hygiene practices, socio-economic status of the family, and number of the children in the family have all been associated with increased incidence of dental caries.[4-7]

Early childhood caries (ECC) and the more severe form of ECC (S-ECC) are virulent forms of caries, beginning soon after tooth eruption, progressing rapidly, and having

a lasting detrimental impact on the dentition.[8-10] This disease affects the general population but is 32 times more likely to occur in infants who are of low socioeconomic status, who consume a diet high in sugar, and whose mothers have a low education level.[11,12]

Geographical location plays a great role in prevalence of dental caries. It varies with the change in location. According to National Oral Health Survey report 2004, caries prevalence in India was 51.9%, 53.8% and 63.1% at ages 5, 12 and 15 years respectively in different parts of India.[13]

World Health Organization has reported that worldwide 60-90% of school children have experienced dental caries at some point of time during their school tenure.[14] Tooth decay or dental caries can hamper child's involvement in activities like eating, playing and socializing. It also affects speaking and concentrating ability, due to which children are not able to perform to the full potential.[15-17]

The present study was conducted with the objective to assess the prevalence of dental caries in the children and to study its correlations with awareness of dental hygiene practices like frequency of teeth brushing, food with high sugar content and fizzy drinks which damage the teeth. The goal of early assessment being the timely delivery of educational information to high risk population groups to prevent the need for later morbidity and surgical intervention.

METHODS

An analytical cross sectional, questionnaire based study was conducted in 3 primary schools in and nearby Pune, admitting children from lower socio-economic strata. The study population consisted of children, both boys and girls, between ages of 5-12 years attending these schools. The age of the children was checked from the school ID card or the register (for the rural school where ID cards were not available). Only apparently healthy school children, between 5-12 years were included in the study. Children with maxillofacial defect and dental malocclusion, history of chronic illness like tuberculosis, hypothyroidism, and known case of seizures on anti-epileptics, rickets and malnutrition were excluded from the study.

The questionnaire consisted of 18 questions to assess the current practices and the awareness of children regarding dental hygiene as given in Table 1. Dental examination findings were recorded. The study was done by interviewing and examining children from three schools of nearby locality. Only the children in the age group of 5-12 years were interviewed after taking consent for the study from the school authorities and parents. Only one student was interviewed and examined at a time. He or she was also provided with basic information to maintain good oral and dental hygiene like frequency of teeth brushing, rinsing mouth after meals, avoiding excessive sugar meals and junk food etc. after examination. The students who were having very poor dental hygiene were referred to the Dental OPD, AFMC Pune. The definition of poor dental hygiene was as per WHO Guidelines 2010 i.e oral hygiene is a condition of the total wellbeing of the teeth as well as the supportive and the soft tissues so that it can properly fulfill the function of mastication, phonation and esthetics.[18]

Statistical analysis

After the completion of the study the filled questionnaires were tabulated on the MS excel sheets to obtain the data in table format and the statistical analysis was done using SPSS software to assess the prevalence of dental caries and to correlate it with the awareness in children about the basic practices of dental hygiene. The association of variables was obtained by Chi-square test.

RESULTS

1000 children participated in the study, the prevalence of caries was observed in 317 cases. Dental caries with 95% confidence interval as calculated by the chi square test was 31.7%. But 6% of children already had caries before this study and had got their teeth restored. Hence, the percentage of children with dental caries was noted to be 37.7%.

Table 1: Questionnaire.

S. No.	Questionnaire
1	How often do you brush your teeth?
2	What do you use for cleaning your teeth?
3	When do you brush your teeth?
4	How long do you brush your teeth?
5	Do your parents watch you while brushing?
6	What does bleeding gums means?
7	How often do you visit your dentist?
8	When was the last time you visited to a dentist?
9	Caries teeth can affect teeth appearance?
10	Sweets affect teeth adversely?
11	Fizzy drinks affect the teeth adversely?
12	Brushing teeth prevents dental decay?
13	General body health has a relationship to oral and dental diseases?
14	You care about your teeth as much as any part of your body?
15	How many are the deciduous teeth?(was asked as a general knowledge question)
16	How many are the permanent teeth? (was asked as a general knowledge question)
17	How many carious teeth do you have? (To be checked on examination by the examiner)
18	How many filled teeth do you have? (To be checked on examination by the examiner)

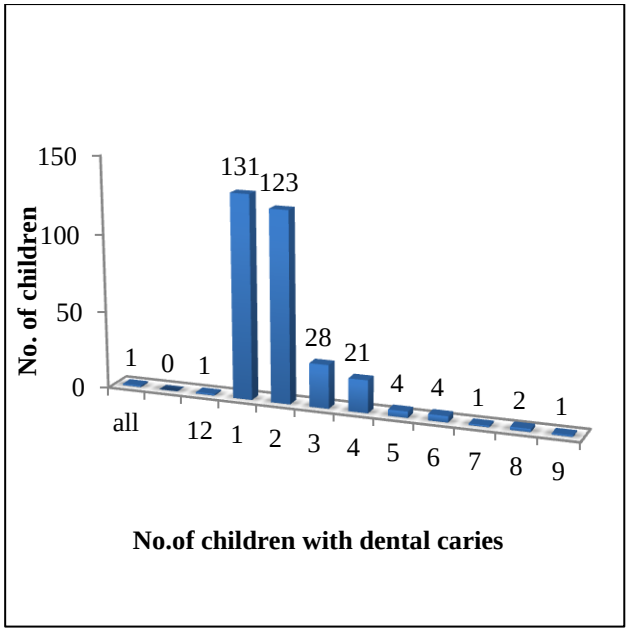

Figure 1: Prevalence of dental caries in children.

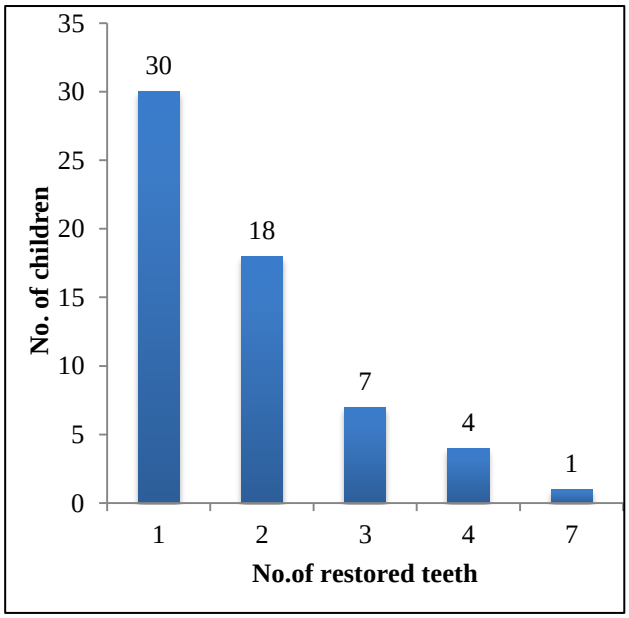

Figure 2: Number of restored teeth in children.

The number of teeth involved in the caries ranged from one tooth to twelve teeth. Figure 1 shows the distribution of caries among the study population and Figure 2 shows the number of filled teeth in children.

From Figure 3, it was evident that dental caries was more prevalent among children of age 5-6 years (43.9%) compared to 10-12 years (27.76%).

The responses given by a child to the questions in Table 1 are presented in Table 2. The oral hygiene habits of our study sample indicated that 4.5% of children brushed more than twice per day, 22.3% of the children twice per day, 54.2% brushed only once per day, whereas 19% brushed their teeth less than once per day. It was seen that 76% of the children used tooth brush and tooth paste to clean their teeth, 20% with toothpaste on fingers, 3% with mouth wash.

Most subjects (67.1%) preferred to brush in the morning. About 31% of the subjects brushed their teeth for more than 2 min, while 28% brushed for at least 2 min and 25% for one minute This difference was statistically significant with $p < 0.001$. A statistical significance ($p < 0.001$) was observed among the role of parents in their daily oral care.

It was found that 12% of the parents advised and watched while brushing. While 28% of the children reported that they were only advised but not watched while brushing. On the contrary, 35% of the children reported that their parents neither advised them nor watched them while brushing. 25.2% children did not know the meaning of it gum recession, 45% thought it was gum bleeding while 7.5% answered as healthy gums.

It was observed that only 4% of the subjects visit their dentist regularly once in every 6-12 months. 23% visit a dentist when they experienced pain, whereas 52% reported that they had never visited a dentist. Approximately 6% of them had their last dental visit 6 months back. This difference was statistically significant ($p < 0.01$) among the children who participated in the study.

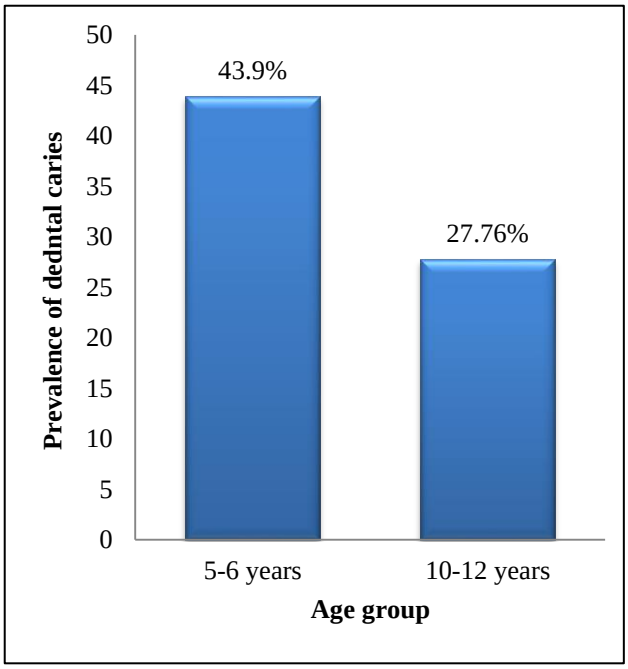

Figure 3: Prevalence of dental caries at different age groups.

Table 2: Reported percentage of total subjects with knowledge on questionnaire.

Questions	A	B	C	D	E	F	G
How often do you brush your teeth?	Less than once	More than twice	Once a day	Twice a day 22.3%			
	19%	4.5%	54.2%				
What do you use for cleaning your teeth?	Brush+ tooth paste	mouthwash	Toothpaste on fingers	Brush+ tooth paste, sometimes			
	75.8%	3.3%	19.8%	9.1%			
When do you brush your teeth?	No response	Before going to the bed	morning	Morning and before going to bed	noon	Other times	Don't brush
	3%	9.9%	67.1%	15.1	4.2%	0.6%	0.01%
For how long do you brush your teeth	No response	<1 min	1 min	2 min	>2 min		
	2%	14.3%	25%	30.4%	30.4%		
Do your parents watch or advice you while brushing?	No response	Never cared	Only mother watches	Only father watches	Don't watch but advice	Watch me while brushing my teeth	
	3.5%	34.5%	22%	0.1%	27.9%	12%	
What does gum bleeding mean?	No response	Gum recession	Healthy gum	Inflamed gum	I don't know		
	4.9%	45%	5.6%	15.1%	29%		
How often do you visit your dentist?	Never	occasionally	Regularly every 6-12 months	When I have dental pain			
	52.3%	21.5%	3.6%	22.6%			
Last time I visited a dentist was?	Never/ I don't remember	Within last 6 months	6-12 months ago	1-2 yrs ago	2-5 yrs ago		
	57.6%	5.8%	6.1%	17.9%	12.6%		
Caries teeth can affect teeth appearance?			No response		yes		no
			1.6%		89.1%		9.3%
Sweets affect teeth adversely?			No response		yes		no
			1.2%		82.7%		16.1%
Fizzy drinks affect the teeth adversely?			No response		yes		no
			1.7%		62.3%		36%
Brushing teeth prevents dental decay?			No response		yes		no
			3.1%		90.7%		6.2%
General body health has a relationship to oral and dental diseases?			No response		yes		no
			0.7%		42.2%		57.1%
You care about your teeth as much as any part of your body?			No response		yes		no
			5.4%		61.8%		5.4%

The Chi square values with odd ratios and significant values about the answers given by the children related to the questionnaire were given from Table 3-7.

89.1% were aware that caries tooth can affect the appearance of the teeth while 9.3% had no knowledge about it. The major factors that cause dental problems according to the child's opinion were sweets (82.7%) and fizzy drinks (62.3%). Hence the children knew brushing their teeth (90.7%) can prevent dental decay. It was seen that 42.2% of the subjects related dental diseases to their general body health and 61.2% of them cared about their teeth as much as any other organs in their body.

Table 3: Do your parents watch you while brushing?

			Carries		Odds ratio	P value
Do your parents watch you while brushing?	No response	Count	18	17	37.938[a]	<0.001
		% within caries	2.6%	5.4%		
	Do not watch but advise me	Count	191	88		
		% within caries	28.0%	27.8%		
	Never cared	Count	219	126		
		% within caries	32.1%	39.7%		
		Count	1	0		
		% within caries	0.1%	0.0%		
	Only my father watches me	Count	146	74		
		% within caries	21.4%	23.3%		
	Only my mother watches me	Count	108	12		
		% within caries	15.8%	3.8%		
	Watch me while brushing my teeth	683	317	1000		
		68.3%	31.7%	100.0%		

Table 4: What does gum bleeding mean?

			Caries	Odds ratio	P value
			0.00		
What does gum bleeding mean?	No response	Count	30	54.429	<0.001
		% within caries	4.4%		
	I do not know	Count	0		
		% within caries	0.0%		
	Gum recession	Count	296		
		% within caries	43.3%		
	Healthy Gum	Count	51		
		% within caries	7.5%		
	I do not know	Count	172		
		% within caries	25.2%		
	Inflamed gum	Count	132		
		% within caries	19.3%		
	Inflamed gum, Gum recession	Count	2		
		% within caries	0.3%		

Table 5: How often do you visit your dentist?

			Caries	Odds ratio	P value
How often do you visit your dentist?	I never visited a dentist	Count	337	19.671	<0.001
		% within caries	49.3%		
	Occasionally	Count	143		
		% within caries	20.9%		
	Regularly every 6-12 months	Count	34		
		% within caries	5.0%		
		% of total	3.4%		
	When I have dental pain	Count	169		
		% within caries	24.7%		
Total		**Count**	**683**		
		% within caries	**100.0%**		

Table 6: Last time you visited a dentist was?

			Caries	Odds ratio	P value
Last time I visited a dentist was	No response	Count	367	18.379	0.003
		% within caries	53.7%		
	Last 1-2 years	Count	132		
		% within caries	19.2%		
	Last 2-5 years	Count	99		
		% within caries	14.5%		
	Last 6-12 months	Count	47		
		% within caries	6.9%		
	Six months ago	Count	39		
		% within caries_ Y_N	5.7%		

Table 7: You care about your teeth as much as any part of your body?

			Caries	Odds ratio and p value	
You care about your teeth as much as any part of your body?	No response	Count	45	21.476	<.001
		% within caries	6.6%		
	No	Count	203		
		% within caries	29.7%		
	Yes	Count	435		
		% within caries	63.7%		

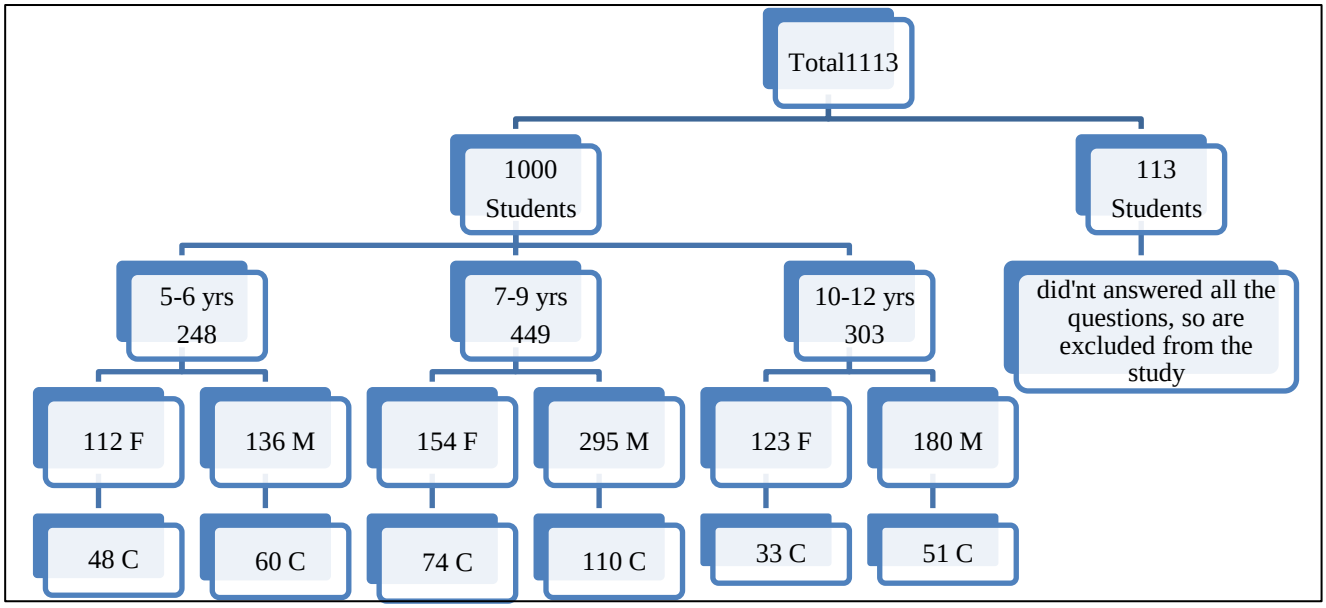

Figure 4: Age and gender wise distribution of caries.

DISCUSSION

Dental caries is a disease of multifactorial origin. There are various host, agent and environment factors which affect the dental caries status of individuals. Among these factors; age, race, ethnicity, cultural factors and diet are few of the factors which vary with different regions and different individuals and play a pivotal role in effecting the dental caries status.[19] The present systematic analysis highlights the dental caries trends among the index age groups of 5-12 years in Pune, India.

In the present study the dental caries was observed in 37.7% children. The prevalence of dental caries in the 10 to 12 years old children was lesser as compared to 5-6 year old children. This could be attributed to the factors

such as a diet higher in sugars and/or the inability of a young child to properly brush teeth on their own. This observation was similar with the studies done by Kundu et al.[19]

The data indicates that majority of the subjects brush their teeth at least once a day, but a significant number i.e., 19% do not brush even at least once a day, indicating the lack of awareness about oral hygiene. Most of the subjects use toothbrush and paste. But around 19.8% use toothpaste or other locally available teeth cleaning agents on their fingers to clean their teeth, reflecting a negligent attitude towards oral hygiene. These results were contrary to the observations reported by WHO (83%) and Punitha and Sivaprakasam (62.9%), in a rural population in Uttaranchal state and Kanchipuram district respectively.[20,21]

Studies suggest very limited oral health knowledge trickled down from the parents.[22,23] In a significant portion of the subjects, the parents do not take adequate interest in their ward's oral hygiene of their children. When they do, it is usually the mother rather than the father, probably because mothers are usually more involved in the grooming of children than fathers, who are usually less concerned but nearly 34.5% children stated that their parents never guide them about teeth good oral hygiene practices. This was similar to the study of Priya et al in which only 14% of the parents motivated the children to seek dental treatment.[24]

On the contrary Barker and Horton in their study on pre-school children in California showed that parents played a major role in influencing their children's oral health and access to care.[25]

The results indicate that a vast majority i.e. 29% subjects were unaware regarding the implications of gum bleeding. Most of them think that bleeding gums are not related to the gum recession. Our observation was similar to Linn, in which only few children knew periodontal disease was a disease of the gingiva and there was no evidence that they knew about plaque.[26]

It was evident that just more than half the respondents had never consulted a dentist probably due to the lack of access to or inability to afford quality healthcare. Only a small minority had regular visits to a dentist. Others seek help from a dentist only when they are symptomatic.

More than half (52%) had never visited a dentist. Only around 6% had used the service of a dentist during the last 6 months and about 20% in last 2 years. This was similar to the study done by Mirza et al in which 46% reported that they never visited the dentist.[27]

Results indicate that there is widespread awareness regarding the cosmetic appearance of caries on teeth. According to the children's, the major factors that cause dental problems were sweets (82.7%) and fizzy drinks (62.3%), which is in parallel to the observations made by Al-Omiri et al in Jordanian children who found that sweets (87.4%) and fizzy drinks (76.5%) had the same response to cause tooth decay.28

The children demonstrated positive attitudes toward their dentists and high awareness of the link between oral health and a relationship with body health in general. Only about 60% responded that they care about their teeth as much as any other part of their body, reflecting on the negligent attitude with which the society at large looks upon dental hygiene. This result was similar to other studies done by Mirza et al on Pakistan school children and Al-Omiri et al on Jordanian school children.[27,28]

CONCLUSION

The present study indicates that there is a high prevalence of dental caries in the children of the low socioeconomic strata and the children are not aware of the ways to maintain a proper oral hygiene and only quarter of them practices good oral hygiene. A multidisciplinary approach is needed to tackle this problem. Both the parents and the children should be educated about good oral hygiene practices. Regular Medical camps in schools, regular visit to family doctor or dentist and reinforcement of good oral hygiene practices from early school years are required to mitigate dental caries in children which is a common chronic problem.

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