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Oral hygiene practices and knowledge among children of age 10-13 years in a private school in Chennai, South India

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ABSTRACT

Background: Oral health is an important and proven determinant of overall health and quality of life. It is well established that oral health and non-communicable diseases share common risk factors. Our study was designed to assess the practice and knowledge of oral health among 10-13 years old because at this age, lifelong beliefs and essential skills are developed.

Methods: A cross-sectional study was done by randomly selecting students from V to VIII standards in a private school. Data was collected using a pre-designed questionnaire. The results were analysed using 'Jamovi' software with 'Pearson Chi-square test' and a p-value of less than 0.05 was considered statistically significant.

Results: Out of the 210 students, only around 1/3rd of the students used both brush with toothpaste, and dental floss to clean their teeth. 123 (58.6%) students brushed twice a day. The association between the frequency of brushing and the age groups was statistically significant. Gender played a role in the duration of brushing.

Conclusions: It can be noted from our study that the oral practices and knowledge was better in 10-11 years olds than the 12-13-year olds and better in girls than in boys. Thus, oral education must be tailor made based on the calibre of a particular group instead of 'one for all' method.

Keywords: School health, Oral health, Practice, Knowledge, 10-13 years olds

INTRODUCTION

Oral health is an important and proven determinant of overall health and quality of life. It is well established that oral health and non-communicable diseases share common risk factors. According to WHO, oral diseases majorly include dental caries, periodontal disease, oral cancer, oral manifestations of HIV, oro-dental trauma, cleft lip and palate, and noma1. Repeated studies in the past have pointed out association between oral disease and heart diseases like coronary artery disease and myocardial infarction. An arteries by antibodies and T-cells produced in response to infection of gum tissues.

While treating patients with heart diseases, it is vital to maintain a good oral health.⁴

Studies have also shown periodontal pathogens and poor oral hygiene are potential risk factors for respiratory infections like pneumonia.^{5,6} This association can be explained by the following - aspiration of pathogens, modification of mucosal surfaces, destruction of salivary film and release of cytokines.^{7,8} Improving oral health, especially periodontal health reduces the occurrence and progression of respiratory infections for those who are at risk.^{5,7,8} Interestingly, diabetes and periodontal diseases have been found to have a reciprocal relationship.^{1,9,10}. In addition to that, it has been known that treating

periodontal infection in diabetics can play a role in maintaining a good glycemic control.¹⁰

Common factors contributing to oral diseases are highsugar diet, tobacco, harmful use of alcohol and poor oral hygiene.¹ A very strong and consistent association between socioeconomic status and prevalence and severity of oral diseases has also been noted.¹ Global burden of diseases states that around 3.5 billion people are affected by oral disease, of which nearly 530 million children suffer from dental caries of milk teeth.⁹ Oral disease is a health burden for many countries but it should be noted that most conditions are preventable and can be treated in their early stages.¹

Schools are the best place to assess the knowledge and practice of oral health of children and also educate them, because at this age lifelong beliefs and essential skills are developed. Teachers and parents play a vital role in improving the oral health condition of the children. Regular inexpensive interventions through health education at the school level have also been proven to be effective for a short term. Our study was designed to assess the oral health practices and knowledge among school going children.

METHODS

This cross-sectional study was conducted among school children belonging to standards V to VIII in a private school in Chennai, India during the month of March, 2020. Students were randomly selected from these classes. The criteria for age was set as 10-13 years. An informed consent was obtained from the Principal of the school and from the students after explaining to them that this study was a non-invasive, survey-based, and the personal information collected will be kept anonymous.

This was questionnaire-based study and was distributed to the children in person. The questionnaire was predesigned and reviewed. The validity of the questionnaire was ensured by asking for opinion from the experts in the field. To test the reliability, a pilot study was done with 10% of the children from the school. The ability of the children to understand the questionnaire was assessed. Minor corrections were done based on the response of the experts and children.

The questionnaire was in English. It had three parts. First part included bio-social variables, gender and age. Second part included seven questions which targeted the individual oral practice habits. Third part contained three questions on the knowledge of oral health. The knowledge questions contained four options of which one was correct and the other three were wrong.

Inclusion criteria

Responders between the ages 10 and 13 years old who could read and understand English were included in the study.

Exclusion criteria

Responders above the age 13 and below 10 years are excluded. Other responders who displayed a lack of comprehension of the English questions were also omitted.

Statistical analysis

The data obtained in this study was analyzed using a software Jamovi. 'Pearson Chi-square test of association' was used to find out the statistical association between the variables. p-value of less than 0.05 (confidence interval of 95%) was considered statistically significant.

RESULTS

210 students submitted the questionnaire between the ages of 10 to 13 years old. There were 79 (37.6%) female responders and 131 (62.4%) male responders. 84 (40%) participants belonged to the 10-11-year-old category and 126 (60%) belonged to the 12-13 years category. (Figure 1 and 2).

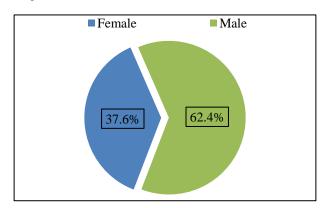


Figure 1: Distribution based on gender.

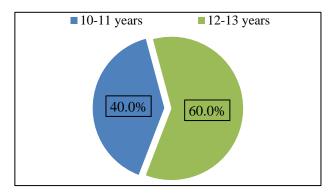


Figure 2: Distribution based on age group.

151 students used only brush and toothpaste to clean their teeth. Only around 1/3rd of the students i.e., 59 (28.1%) used both brush with toothpaste and dental floss to clean their teeth. 10% more boys used both of these than the girls. More than half of the students i.e., 123 (58.6%) students brushed twice a day. 77 students brushed once a day and 9 students brushed more than twice a day. With regards to brushing twice, the girls outnumbered the boys by around 8%. 73.8% among 10-11 years brushed twice a day while only 48.4% among 12-13 years brushed twice. The association between the frequency of brushing and the age groups was statistically significant with a p-value of 0.001 (<0.05). Only 24 students, that is 11.4% of the total students used toothpaste about the size of the pea on their toothbrush. Almost half of the students (n-118) used the full length of the bristles, while nearly 1/3rds (n-67) used half the length of the bristles. (Table 1).

Gender played a role in the duration of brushing. p-value was 0.022 (<0.05) and was statistically significant. 111 students (52.9%) brushed for about 2 minutes. Here, the girls performed better at about 62% while only 47.3% of boys brushed for 2 minutes. 14 students brushed around 30 seconds and 10 didn't know the duration. The percentage was almost equal when it came to the age

category who brushed for about 2 minutes, 51.2% amongst 10-11year old's and 54% amongst 12-13-year old's. With regards to when they brush, there was a statistically significant association with the two age groups having a p-value of 0.001 (<0.05). 122 students brushed both in the morning and evening. 69% of 10-11year old's and 50.8% of 12-13-year old brushed in this pattern. 85(40.5%) responders brushed only in the morning. Most students (57.6%) never flossed their teeth. 23.8% flossed once a day, 10.5% flossed twice or more and 8.1% didn't know about dental flossing. Among the students who flossed once a day, 10-11-year old's did better than the 12-13 year olds. Chi-square test revealed a p-value of 0.020(<0.05) between the age categories and frequency of dental flossing. Gender and age groups didn't play a role in how often the students visited the dentist. 90 students visited the dentist only when they had a toothache. 27.6% of the students never visited the dentist and 14.8% visited once a year and the rest 14.8% visited twice a year. It can be noted from our study that the oral practices were better in 10-11-year olds than in the 12-13-year olds, and also better among the girls than the boys. (Table 1)

Table 1: Association of oral health practice with bio-social variables gender and age.

Questions on practice	Options	Total	Female N (%)	Male N (%)	P-value	10-11 years N (%)	12-13 years N (%)	P value
1) What do you use for cleaning your teeth? 2) How often do you brush your teeth each day?	 a) Dental floss only b) Brush & Tooth paste only c) Brush & Tooth paste with dental floss* d) Don't know a) Less than once a day b) Once a day 	0 (0) 151 (71.9) 59 (28.1) 0 (0) 1 (0.5) 77 (36.7)	0 (0) 61 (77.2) 18 (22.8) 0 (0) 0 (0) 27 (34.2)	0 (0) 90 (68.7) 41 (31.3) 0(0) 1(0.8) 50 (38.2)	0.184	0 (0) 55 (65.5) 29 (34.5) 0 (0) 1 (1.2) 18 (21.4)	0 (0) 96 (76.2) 30 (23.8) 0 (0) 0 (0) 59 (46.8)	0.091
	c) Twice a day* d) More than twice a day a) Full length of	123 (58.6) 9 (4.3)	50 (63.3) 2 (2.5)	73 (55.7) 7(5.3)	0.530	62 (73.8) 3(3.6 % 43	61 (48.4) 6(4.8)	
3) How much toothpaste do you normally put on your toothbrush?	bristles b) Half length of bristles c) About the size of a pea* d) About the size of a	118 (56.2) 67 (31.9) 24 (11.4) 1 (0.5)	36 (45.6) 32 (40.5) 10 (12.7) 1 (1.3)	82 (62.6) 35 (26.7) 14 (10.7) 0(0)	0.063	43 (51.2) 26 (31) 14 (16.7) 1(1.2)	(59.5) 41 (32.5) 10 (7.9) 0(0)	0.137
4) How long do you normally take to brush your teeth?	grain of rice a) About 30 seconds b) About 1 minute c) About 2 minutes* d) Don't know	14 (6.) 75 (35.7) 111 (52.9) 10 (4.8)	2 (2.5) 22 (27.8) 49 (62) 6 (7.6)	12 (9.2) 53 (40.5) 62 (47.3) 4 (3.1)	0.022	6(7.1) 32 (38.1) 43 (51.2) 3 (3.6)	8(6.3) 43 (34.1) 68 (54) 7 (5.6)	0.859

Continued.

Questions on practice	Options	Total	Female	Male	P-value	10-11 years	12-13 years	P value
practice		N (%)	N (%)	N (%)		N (%)	N (%)	
5) When do you normally brush your teeth?	a) Only in the morning	85	29	56	0.242	23	62	0.001
		(40.5)	(36.7)	(42.7)		(27.4)	(49.2)	
	b) Only in the evening	0(0)	0 (0)	0 (0)		0(0)	0(0)	
	c) In the morning and	122	50	72		58	64	
	evening*	(58.1)	(63.3)	(55)		(69)	(50.8)	
	d) Don't know	3(1.4)	0(0)	3(2.3)		3 (3.6)	0 (0)	
6) How often do you floss your teeth each day?	- \ NI	121	48	73	0.802	43	78	0.020
	a) Never	(57.6)	(60.8)	(55.7)		(51.2)	(61.9)	
	b) Once a day*	50	16	34		29	21	
		(23.8)	(20.3)	(26)		(34.5)	(16.7)	
	c) Twice or more than twice a day	22 (10.5) 8	8 (10.1)	14		0 (0.5)	14	
				(10.7)		8 (9.5)	(11.1)	
	d) Don't know	17 (8.1) 7(8.	7(0)	10		4 (4.8)	13	
			/(8.)	(7.6)			(10.3)	
7) How often do you visit your dentist?	a) Once a year	31	14	17	0.196	13	18	0.203
		(14.8)	(17.7)	(13)		(15.5)	(14.3)	
	b) Twice a year* c) Only when I have a toothache	31	0(11.4)	22		17	14	
		(14.8)	9(11.4)	(16.8)		(20.2)	(11.1)	
		90	39	51		30	60	
		(42.9)	(49.4)	(38.9)		(35.7)	(47.6)	
	d) I don't visit the	58	17	41		24	34	
	dentist	(27.6)	(21.5)	(31.3)		(28.6)	(27)	

^{*}suggests better oral practice than the other options.

Table 2: Association of oral health knowledge with bio-social variables gender and age.

Questions on knowledge	Options	Total	Female	Male	P-value	10-11 Years	12-13 Years	P-value
		N (%)	N (%)	N (%)		N (%)	N (%)	
1) Not cleaning your teeth can cause?	a) Decay	14 (6.7)	3 (3.8)	11 (8.4)	_	7 (8.3)	7 (5.6)	0.370
	b) Gum disease	4 (1.9)	1 (1.3)	3 (2.3)		3 (3.6)	1 (0.8)	
	c) All of the above*	179 (85.2)	72 (91.1)	107 (81.7)	0.318	70 (83.3)	109 (86.5)	
	d) Causes nothing	13 (6.2)	3 (3.8)	10 (7.6)		4 (4.8)	9 (7.1)	
2) What happens if you eat a lot of sweets?	a) It's good for your teeth	5 (2.4)	1 (1.3)	4 (3.1)	0.210	1 (1.2)	4 (3.2)	0.131
	b) It's bad for your teeth*	189 (90)	70 (88.6)	119 (90.8)		80 (95.2)	109 (86.5)	
	c) It has no effect on your teeth	11 (5.2)	4 (5.1)	7 (5.3)		1 (1.2)	10 (7.9)	
	d) Don't know	5 (2.4)	4 (5.1)	1 (0.8)		2 (2.4)	3 (2.4)	
	a) It's good for your teeth	8 (3.8)	3 (3.8)	5 (3.8)		2 (2.4)	6 (4.8)	0.148
3) What	b) It's bad for your	164	63	101		71	93	
happens if you	teeth*	(78.1)	(79.7)	(77.1)	0.494	(84.5)	(73.8)	
drink a lot of fizzy drinks?	c) It has no effect on your teeth	21 (10)	5 (6.3)	16 (12.2)	0.494	4 (4.8)	17 (13.5)	
	d) Don't know	17 (8.1)	8 (10.1)	9 (6.9)		7 (8.3)	10 (7.9)	

^{*}suggests correct knowledge.

Three questions were asked to test the knowledge of the students. For the 1st question 'not cleaning your teeth can cause?', 179 (85.2%) participants answered correctly as 'all of the above - both decay and gum disease'. Similarly, 189 (90%) of the students chose the correct answer it is 'bad for your teeth' for the 'what happens if you eat a lot of sweets'. For the 3rd question 'what happens if you drink a lot of fizzy drinks' the right option was 'bad for your teeth'. 78.1% i.e., 164 students answered it correctly. 1st and 3rd questions were answered better by the girls than the boys. 2nd and 3rd questions were answered better by the 10-11-year olds than the 12-13-year olds (Table 2).

DISCUSSION

In our study, brush and toothpaste was used by 71.9% of the children which was similar to the study done by Mehta et al with 71.4%.14 Studies by Lian et al, Togoo et al, Dixit et al, Priya et al and Vishwanathaiah have revealed similar results where brush and toothpaste was the most used method to clean their teeth among school children. 15-19 Though the appropriate method would be to use dental floss along with brush and toothpaste, only 28.1% of the children did that. A separate question was framed to check the frequency of dental floss use. 121 out of 210 students never used dental floss and 17 students didn't know about dental floss. These huge numbers might suggest the lack of awareness about flossing and its importance among school children. Our study revealed an interesting suggestion where 34.5% of the 10-11-year olds used floss while only 16.7% used it among the 12-13-year olds. The frequency of flossing was influenced by age groups in our study.

Majority of the students i.e 58.6% brushed twice a day. This was parallel to studies where students brushed twice a day. 15,18,20,21 Studies yielded quite an opposite result where majority of the students brushed only once a day. 16,17,19,22,23 Studies done in Portugal revealed similar results to ours among the 12-13 years old, where the majority brushed two times in a day.^{21,24} On the contrary, Study showed that majority (41.8%) of the 12 year olds brushed only once a day and also the boys did better which was again opposite to ours as the girls did better by almost 8%. 14 When it comes to the amount of toothpaste put on the toothbrush, our study stands similar to that of study in Davangere. 19 The appropriate amount 'about the size of the pea' was given by only 11.4% of the students in our study which was similar to the study in Davangere where 11% did the same.²⁵ In both the studies, most students preferred full length of bristles toothpaste amount.¹⁹ This particular pattern can be correlated to the misconception shown in advertisements where nearly full length of the bristles is covered by toothpaste for effective cleaning.

Nearly half of the students (52.9%) took about 2 minutes to brush their teeth. Our findings were in contrast to

studies where the majority of them brushed more than two minutes. 18,20 Study by Al-Tayar et al showed the majority of them brushed for about one minute. 26 Like our survey produced similar results where percentage of girls was more than boys in brushing for 2 minutes and also for brushing both in the morning and night. 26 Majority (42.9%) visited the dentist only when they had a toothache. This was comparable to findings in studies. 15,16,18,26 Only a meagre 14.8% visited the dentist twice a year. This might be because of the common misunderstanding that symptom free or minor symptoms means there is no oral health problem. Among the 12-13-year olds, majority opted for 'dental visit only when having toothache' which was in agreement with a study in Qatar. 24

Knowledge on sweets and fizzy drinks gave results similar to studies where students gave the right answer as bad for teeth. ^{15,16,18,20} Among the 12-13 year olds, the percentage of students with appropriate knowledge was on par with the children. ^{14,24,27} Our study was in agreement with the studies in the past showing that girls had a better oral health practice than boys. ^{14,22,23,26,27} This data suggests that the girls might be more cautious and careful when it comes to self-care when compared to the boys.

Our study is subjected to potential limitations. Our study lacks the ability to be generalised because it was limited by a particular demographic profile. Readers must also bear in mind that the results of this study indicate only the practice of oral hygiene and not the attitude or oral health status of the subjects. Future research has to focus on studying the effectiveness of oral health education on oral health practice as this data would be of more practical use.

CONCLUSION

In our study it is evident that the younger age group and the female participants had better practice and knowledge than their respective counterparts. It is evident that though one can assume that the knowledge and practice would improve as one ages, it might not be true. Thus, oral education must be tailor-made based on the calibre of that particular age group instead of 'one for all' method.

School management teams must actively participate in educating the children and assessing their oral health status time and time again. It should be emphasised how oral health can have an effect on the overall health and also how oral health interventions can help in reducing the incidence of systemic diseases. Regular feedback has to be sent from parents to teachers and vice-versa to have a good and supportive system around the children.

Educating the children is the key to overall development of the future. Their knowledge and practice will influence them largely when they grow up and also have an effect on the people around them. Like general health, oral health must be given equal importance and emphasis should be made in the school education itself.

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