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Original Research Article

Oral health practices among 10-15 years of government school children in Chengalpattu district, India: a cross-sectional survey

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ABSTRACT

Background: Oral health is a fundamental part of the general health and well-being of an individual. Oral hygiene refers to the practice of maintaining a clean oral cavity to prevent dental problems like dental cavities, bad breath, gingivitis, and periodontitis. Aim was to assess oral health practices among 10-15 years of government school children in Chengalpattu district, India.
Methods: This cross-sectional study included 1500 government school children aged 10-15 years based on the guidelines of the strengthening the reporting of observational studies in epidemiology. Each child was asked about the dental hygiene practices.
Results: The study population was composed of 545 (36.3%) participants who belonged to the 10-12-year-old category and 955 (63.7%) belonged to the 13-15 years category. While assessing the oral hygiene practices of the children, 86.1% of children used toothbrush and toothpaste as oral hygiene aids. In our study more than half of the students 59% reported that they brush only in the morning that 32.8% of children felt stinky sometimes in their oral cavity. Only around 28.5% had used the service of a dentist during the last 6 months and about 12.8% in the last 1 year.
Conclusions: The study results concluded that oral hygiene practices were enhanced among male children when compared to female children and showed a positive attitude in preserving appropriate oral health.

Keywords: Oral hygiene practices, Government school, Children

INTRODUCTION

Oral health is a fundamental part of the general health and well-being of an individual. Oral hygiene refers to the practice of maintaining a clean oral cavity to prevent dental problems like dental cavities, bad breath, gingivitis, and periodontitis. Oral hygiene is defined as "a standard of health of the oral and related tissues which enables an individual to eat, speak, and socialize without active disease, discomfort, or embarrassment and which contributes to general well-being".[1]

The prevalence of dental caries among school children, from the available studies, ranges from 31.5% to 89%, in different parts of the country.[2] The pooled prevalence of dental caries among Indian children over the past 25 years was reported to be 56.7%.[3] Children <18 years constitute about 40% of the Indian population.[4] In India, the majority, i.e. 70–72% of the population live in the rural areas of which more than 40% are children and the majority of these children are more vulnerable to oral health problems due to various socioeconomic and demographic factors such as lack of awareness, poor transport facilities, and poor accessibility to quality dental care.[5]

According to the World Health Organization (WHO), poor oral health can have a negative effect on children's performance at school and impacts their future academic success. Oral health problems also reduce people's ability to smile, eat, and talk, and have a detrimental effect on their social and mental health.[6] Children having poor oral health are 12 times more likely to have more restricted days, including missing school, than those who do not. Pain, discomfort, sleepless nights, and time off school or work are the common problems for many children and adults. Each year, more than 50 million hours are lost from school due to oral diseases.[7] Poor oral health and untreated dental conditions can have a significant impact on the quality of life of children which may lead to the overall deterioration of health.[8] The delay in treatment not only results in aggravation of disease but also costs of care are substantially escalated as a consequence.[9]

According to current estimates, 80% of all schools in India are government schools, making the government, the major provider of education.[10] 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. Most of the studies have reported improved oral hygiene practices during childhood as a result of major changes in oral hygiene behavior.[11] The WHO recommends oral health promotion in schools for the prevention and control of oral health problems among school children by improving their knowledge, attitude, and behaviour toward oral health.[12]

The age of 12 years has been universally accepted the as global monitoring age for caries since all permanent teeth except third molars would most likely have erupted by this age. By the age of 15, the dietary habits of the individuals are more or less established and the permanent teeth have been exposed to the oral environment for 3–9 years, thus assessing oral hygiene practices are even more meaningful at this age.[13]

Proper guidance is essential for the growing children regarding oral hygiene and it is proven that schools are the best center for effectively implementing comprehensive health care programmes, as children are easily accessible at schools.[14] Thus, to appreciate the changing trends of dental caries amongst the said age groups (10-15 years) and over the defined geographical distribution areas, an attempt of the cross-sectional survey was aimed to assess oral health practices among 10-15 years of government school children in Chengalpattu district, India.

METHODS

A descriptive cross-sectional survey was conducted to assess the oral hygiene practices among 10–15-year school children in a government school-based setting over three months (March 2022 to May 2022). The study design was based on the guidelines of the strengthening the reporting of observational studies in epidemiology (STROBE initiative).

A detailed protocol of the study was prepared and approved by the institution review board, Karpaga Vinayaga Institute of Dental Sciences, Chengalpattu before the start of the study. Permission to conduct the study was obtained from the school authority and further consent to participate in this study was also obtained from the parents of the study participants in the local dialect (Tamil). Oral assent was obtained in the presence of their respective class teachers from the school children and assured of confidentiality in the study findings.

Sample size selection

Fifteen schools in the study site (Chengalpattu district) were approached and explained the nature and purpose of the study, out of which nine schools were permitted to conduct the study.

A multistage random sample using a stratified random technique with proportional allocation was employed (Levy and Lemeshow, 1980). WHO (1997) recommended the sample size in each age group (12,13,14, and 15 years) range from a minimum of 25–50 for each sampling site. In this way, the range of variability in the population is adequately represented, i.e. the sample is representative of the population. Consequently, 40 children from each age at each sampling site were planned for selection; the survey sample size for each age group was calculated as follows.

$$Nine\ school\ sites\ in\ the\ district\ (Chengalpattu) = 6 \times 40 = 240$$

The distribution applied to six age groups (10, 11, 12, 13, 14, and 15 years); consequently, the total sample size that should be selected for the study was $6 \times 240 = 1440$ children. Therefore, 1500 school children were selected, which was sufficient to address the objectives of the study, and followed the recommended WHO guideline sample size for a national basic oral health survey (WHO, 1997).

Eligibility criteria

School children who had completed 10-15 years of age and who were present on the day of the examination were included in the study. Children only studying in Government schools are included. Children who are below 10 and above 15 years of age are exempted and children with any systemic illness and whose parents/guardians refused to participate were excluded from the study. Children from private schools were excluded from the study.

Data collection

The participants were given a brief explanation about the study and the participation was voluntary and self-administrative. The data collection tool for the present study was a two-part questionnaire: first, demographic characteristics about the details consisting of participants' age, gender, and year of study were collected; second, the

questionnaire related to oral hygiene practices comprised 11 questions (multiple-choice questions).

The pilot survey was carried out and the questionnaire was assessed for content validity and internal consistency of the questionnaire was found to be good (Cronbach's alpha=0.84) and further modifications were done to the questionnaire. The questions were rephrased, reframed, added, and removed from the questionnaire. The questionnaire was translated into Tamil, the local vernacular language by language experts. The questionnaire was back-translated to English to check for any discrepancies.

Data analysis

Data collected in the study were entered into a Microsoft Excel spreadsheet, and a master table was prepared. The data were analyzed using IBM statistical package for the social sciences (SPSS) for windows version 20.0 software (IBM Corp., Armonk. NY). Analysis of demographic variables and was were performed using the Chi-square test. For all analyses, $p<0.05$ was considered to be statistically significant.

RESULTS

A total of 1500 school children completed the study; of which 447 (29.8%) were female and 1053 (70.2%) were male. The study population was composed of 545 (36.3%) participants who belonged to the 10-12-year-old category and 955 (63.7%) belonged to the 13-15 years category (Figures 1 and 2).

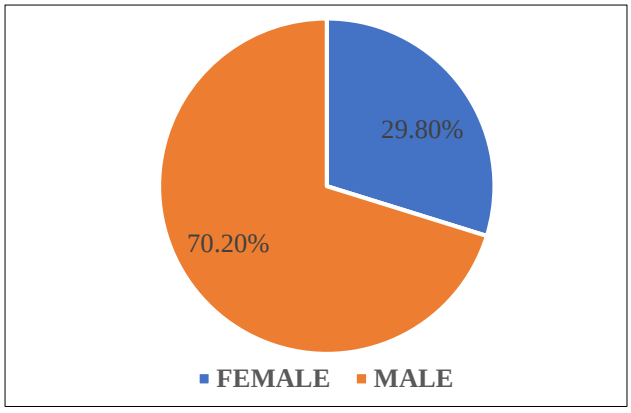

Figure 1: Distribution based on gender.

Among the total participants, 1291 (86.1%) students used toothbrushes and toothpaste to clean their teeth of which 871 (82.7%) were male and 420 (94.0%) were female. Only around 1/3rd of the students (7.7%) used both brushes with toothpowder to clean their teeth. 10% more boys used both of these than the girls.

More than half of the students i.e. 1040 (69.3%) students brushed once a day of which 750 (71.2%) were male and 290 (64.9%) were female and it was found to be statistically significant p=0.000. About 236 (15.7%) students brushed twice a day and 42 (2.8%) students brushed more than twice a day. The majority (69.3%) of children aged 10-12 years brushed once a day while only 16.9% among 13-15 years brushed once and it was found to be statistically significant p=0.002. Among total participants, only 24.3% of the total students used toothpaste about the size of a pea on their toothbrushes. Almost half of the students (46.5%) used half the length of the bristles, while nearly 1/3rd (23.2%) used the full length of the bristles.

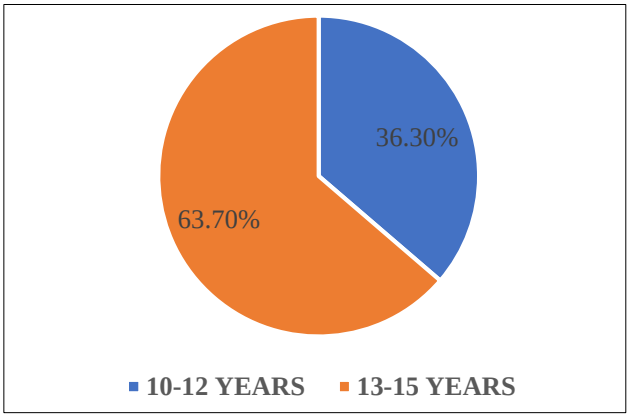

Figure 2: Distribution based on age.

Nearly half (44.4%) of total children reported that they brush their teeth only in the morning of which children of 13-15 years (67.3%) predominant than 10-12 years children (44.4%) and it was found to be statistically significant (p=0.000) between the age groups. About 403 students (26.9%) brushed for about 2 minutes. Here, the boys performed better at about 31.7% while only 15.4% of girls brushed for 2 minutes. About 322 students (21.5) brushed around 30 seconds and 203 (13.5) students didn't know the duration. In comparing with the age category, 30.8% and 24.6% of children brushed for about 2 minutes at 10-12 years and 13-15 years respectively. Gender played a significant role in the duration of brushing and it was found to be statistically significant (p=0.000).

Among the total children, about 39.7% reported that they never felt stinky in their oral cavity, 32.9% sometimes felt stinky in their oral cavity, 16.9% often felt stinky in their oral cavity and 10.6% felt stinky after eating some foods. Among the students who never felt stinky, 13-15-year old's (41.2%) showed higher results than the 10–12-year-old children (37.2%). The Chi-square test revealed a p value of 0.000 between the age category and frequency of stinky and showed a statistically significant difference. More than half 795 (53%) of the children had never visited a dentist of which 55.5% were male and 47.2% were female and it was found to be statistically significant p=0.000 and 30.5% of them stated that they will visit a dentist only when they have a toothache (Tables 1 and 3).

Three questions were asked to test the knowledge of the students. For the 1st question 'not cleaning your teeth can

cause?', 731 (48.7%) participants answered correctly as 'all of the above - both decay and gum disease'. Similarly, 1011 (67.4%) 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. 63.4% i.e. 951 students answered it correctly. 2nd and 3rd questions were answered better by the boys than the girls. 1st, 2nd and 3rd questions were answered better by the 10-12-year-olds than the 13-15-year-olds (Tables 2 and 4).

Male children exhibited higher knowledge scores than female children and it was found to be a statistically significant difference and 10–12-year children predominantly answered better than 13–15-year-old children when questions asked about oral health knowledge.

Table 1: Distribution of oral health practice based on gender.

Questions on practice and options	Total N (%)	Male N (%)	Female N (%)	P value
1.What do you use for cleaning your teeth?				
a) Brush and tooth powder	116 (7.7)	94 (8.9)	22 (4.9)	0.000
b) Brush & toothpaste	1291 (86.1)	871 (82.7)	420 (94.0)	
c) Neem stick	84 (5.6)	79 (7.5)	5 (1.1)	
d) Brushing with fingers	9 (0.6)	9 (0.9)	0 (0)	
2. How often do you brush your teeth each day?				
a) Less than once a day	182 (12.1)	35 (3.3)	147 (32.9)	0.000
b) Once a day	1040 (69.3)	750 (71.2)	290 (64.9)	
c) Twice a day	236 (15.7)	226 (21.5)	10 (2.2)	
d) More than twice a day	42 (2.8)	42 (4.0)	0 (0)	
3. How much toothpaste do you normally put on your toothbrush?				
a) Full length of bristles	348 (23.2)	232 (22.0)	116 (26)	0.000
b) Half-length of bristles	697 (46.5)	582 (55.3)	115 (25.7)	
c) About the size of pea	365 (24.3)	196 (18.6)	169 (37.8)	
d) About the size of grain	88 (5.9)	43 (4.4)	45 (10.1)	
4. How long do you normally take to brush your teeth?				
a) About 30 seconds	322 (21.5)	94 (8.9)	228 (51.0)	0.000
b) About 1 minute	572 (38.1)	474 (45.0)	98 (21.9)	
c) About 2 minutes	403 (26.9)	334 (31.7)	69 (15.4)	
d) Don't know	203 (13.5)	151 (14.3)	52 (11.6)	
5. When do you normally brush your teeth?				
a) Only in the morning	885 (59)	571 (54.2)	314 (70.2)	0.000
b) Only in the evening	194 (12.9)	158 (15.0)	36 (8.1)	
c) In the morning and evening	392 (26.1)	303 (28.8)	89 (19.9)	
d) Don't know	29 (1.9)	21 (2.0)	8 (1.8)	
6) Do you feel stinky sometimes?				
a) Never	596 (39.7)	498 (47.3)	98 (21.9)	0.000
b) Sometimes	492 (32.8)	382 (36.3)	110 (24.6)	
c) Often	253 (16.9)	55 (5.2)	198 (44.3)	
d) After eating some foods	159 (10.6)	118 (11.2)	41 (9.2)	
7) How often do you visit your dentist?				
a) Once a year	192 (12.8)	182 (17.3)	10 (2.2)	0.000
b) Twice a year	148 (9.9)	133 (12.6)	15 (3.4)	
c) Only when I have a toothache	458 (30.5)	283 (26.9)	175 (39.1)	
d) I don't visit the dentist	702 (46.8)	455 (43.2)	247 (55.3)	
8) When was your last dental visit?				
a) A week ago	68 (4.5)	61 (5.8)	7 (1.6)	0.000
b) A month ago	210 (14)	195 (18.5)	15 (3.4)	
c) 6 months ago	427 (28.5)	213 (20.2)	214 (47.9)	
d) Never	795 (53)	584 (55.5)	211 (47.2)	

Table 2: Distribution of oral health knowledge based on gender.

Questions on knowledge and options	Total N (%)	Male N (%)	Female N (%)	P value
1) Not cleaning your teeth can cause?				
a) Decay	260 (17.3)	116 (11.0)	144 (32.2)	0.000
b) Gum disease	262 (17.5)	227 (21.6)	35 (7.8)	
c) All of the above	731 (48.7)	508 (48.2)	223 (49.9)	
d) Causes nothing	247 (16.5)	202 (19.2)	45 (10.1)	
2) What happens if you eat a lot of sweets?				
a) It's good for your teeth	85 (5.7)	75 (7.1)	10 (2.2)	0.000
b) It's bad for your teeth	101 (67.4)	720 (68.4)	291 (65.1)	
c) It has no effect on your teeth	136 (9.1)	120 (11.4)	16 (3.6)	
d) Don't know	138 (9.2)	138 (13.1)	130 (29.1)	
3) What happens if you drink a lot of fizzy drinks?				
a) It's good for your teeth	77 (5.1)	65 (6.2)	12 (2.7)	0.001
b) It's bad for your teeth	951 (63.4)	668 (63.4)	283 (63.3)	
c) It has no effect on your teeth	146 (9.7)	111 (10.5)	35 (7.8)	
d) Don't know	326 (21.7)	209 (19.8)	117 (26.2)	

Table 3: Distribution of oral health practice based on age.

Questions on practice and options	Total N (%)	10-12 years N (%)	13-15 years N (%)	P value
1.What do you use for cleaning your teeth?				
a) Brush and tooth powder	116 (7.7)	34 (6.2)	82 (8.6)	0.256
b) Brush and toothpaste	1291 (86)	481 (88.3)	810 (84.8)	
c) Neem stick	84 (5.6)	28 (5.1)	56 (5.9)	
d)Brushing with fingers	9 (0.6)	2 (0.4)	7 (0.7)	
2. How often do you brush your teeth each day?				
a) Less than once a day	182 (12.1)	53 (9.7)	129 (13.5)	0.002
b) Once a day	1040 (69.3)	92 (16.9)	665 (69.6)	
c) Twice a day	236 (15.7)	375 (68.8)	144 (15.1)	
d) More than twice a day	42 (2.8)	25 (4.6)	17 (1.8)	
3. How much toothpaste do you normally put on your toothbrush?				
a) Full length of bristles	348 (23.2)	127 (23.3)	221 (23.1)3	0.000
b) Half-length of bristles	627 (41.8)	299 (54.9)	98 (41.7)	
c) About the size of pea	345 (23)	116 (21.3)	249 (26.1)	
d) About the size of grain	88 (5.9)	25 (4.6)	86 (9.0)	
4. How long do you normally take to brush your teeth?				
a) About 30 seconds	322 (6.2)	34 (6.2)	288 (30.20	0.000
b) About 1 minute	572 (55.6)	303 (55.6)	269 (28.2)2	
c) About 2 minutes	403 (30.8)	168 (30.8)	35 (24.6)	
d) Don't know	203 (7.3)	40 (7.3)	163 (17.1)	
5. When do you normally brush your teeth?				
a) Only in the morning	885 (44.4)	242 (44.4)	643 (67.3)	0.000
b) Only in the evening	194 (18.9)	103 (18.9)	91 (9.5)	
c) In the morning and evening	392 (34.9)	190 (34.9)	202 (21.2)	
d) Don't know	29 (1.8)	10 (1.8)	19 (2.0)	
6) Do you feel stinky sometimes?				
a) Never	596 (39.7)	203 (37.2)	393 (41.2)2	0.000
b) Sometimes	492 (32.8)	260 (47.7)	32 (24.3)	
c) Often	253 (16.8)	36 (6.6)	217 (22.7)	
d) After eating some foods	159 (10.6)	46 (8.4)	113 (11.8)	
7) How often do you visit your dentist?				
a) Once a year	192 (12.8)	118 (21.7)	74 (7.7)	0.000

Continued.

Questions on practice and options	Total N (%)	10-12 years N (%)	13-15 years N (%)	P value
b) Twice a year	148 (9.9)	85 (15.6)	63 (6.6)	
c) Only when I have a toothache	458 (30.5)	143 (26.2)	315 (33.0)	
d) I don't visit the dentist	702 (46.8)	199 (36.5)	503 (52.7)	
8) When was your last dental visit?				
a) A week ago	68 (4.5)	40 (7.3)	28 (2.9)	0.000
b) A month ago	210 (14)	119 (21.8)	91 (9.5)	
c) 6 months ago	427 (28.4)	83 (15.2)	344 (36.0)	
d) Never	795 (53)	303 (55.6)	492 (51.5)	

Table 4: Distribution of oral health knowledge based on age.

Questions on knowledge and options	Total N (%)	10-12 years N (%)	13-15 years N (%)	P value
1) Not cleaning your teeth can cause?				
a) Decay	260 (17.3)	87 (16.0)	173 (18.1)	0.000
b) Gum disease	262 (17.4)	91 (16.7)	171 (17.9)	
c) All of the above	731 (48.7)	316 (58.0)	415 (43.5)	
d) Causes nothing	247 (16.4)	51 (9.4)	196 (20.5)	
2) What happens if you eat a lot of sweets?				
a) It's good for your teeth	85 (5.7)	42 (7.7)	43 (4.5)	0.000
b) It's bad for your teeth	1011 (67.4)	423 (77.6)	588 (61.6)	
c) It has no effect on your teeth	136 (9.1)	26 (4.8)	110 (11.5)	
d) Don't know	68 (4.5)	54 (9.9)	214 (22.4)	
3) What happens if you drink a lot of fizzy drinks?				
a) It's good for your teeth	77 (5.1)	35 (6.4)	42 (4.4)	0.000
b) It's bad for your teeth	951 (63.4)	376 (69.0)	575 (60.2)	
c) It has no effect on your teeth	146 (9.7)	23 (4.2)	123 (12.9)	
d) Don't know	326 (21.7)	111 (20.4)	215 (22.5)	

DISCUSSION

Schools provide a platform for the promotion of health and oral health not only for the students, but also, for the staff, families, and members of the community as a whole. The assessment of oral hygiene practices of children in government schools may provide us with baseline data from different age group backgrounds and gender. This helps in prioritizing the services to the high-risk groups when policies and programs for school-going children are implemented.[15] To the best of our knowledge, this is the first comprehensive survey based on empirically derived oral hygiene practices data among 10–15 years Government school children in Chengalpattu district, India.

In the present study, a 10–15 years school children study group was selected because these age groups are considered as "caries and disease trend global monitoring ages" for international comparisons and monitoring (WHO, 1997).[16]

In the present study, the most common aid used for maintaining oral hygiene was toothbrush and toothpaste. While assessing the oral hygiene practices of the children, 86.1% of children used tooth brush and toothpaste as oral hygiene aids, as reported in the previous studies provided similar results where brush and toothpaste were the most used method to clean their teeth among school children.[17,18] Our study findings revealed that 88.3% of 10-12 years stated that they will use a brush and toothpaste to clean their teeth and a statistically significant difference was found between 10-12 years and 13-15 years. This can be attributed due to the reason that young children have more attention and a higher attitude towards maintaining oral hygiene.

The study also demonstrated that 69.3% of the respondents cleaned their teeth once daily. This finding was similar to the study reported by Al Tamimi and Peterson.[19] Only 15.7% of total students reported that they brushed twice a day. The study showed that the majority (68.8%) of the 10-12-year children brushed twice a day and also the boys did better than girls.

The findings are consistent with the study done by Kanagavelu et al. The study results emphasize that there is a lack of knowledge among female children regarding the brushing frequency.[11]

Only 24.3% of children did apply toothpaste to about the size of a pea and 46.5% of children preferred using half-

length of toothpaste on the bristles of toothbrushes. This finding is in contrast to the study reported by Rajab et al.[19,20] This could be because of the influence of social media where the advertisements showed nearly half to a full length of the bristles is covered by toothpaste for effective cleaning.

About 26.9% of children brushed their teeth for a duration of 2 minutes; a similar practice was observed in studies by Kumar and Joshi and Lian et al.[21,22] There was a significant difference between the genders (p=0.000), with a larger proportion of males (31.7%) spending 2 minutes in cleaning their teeth as compared to females (15.4%). Boys were found to brush their teeth more frequently and spent longer time during tooth brushing as compared to girls. This was in contrast to the studies conducted by Lian et al, Gordon and Roberts, Al-Sadhan, and Honkala et al.[21,23-25]

In our study more than half of the students 59% reported that they brush only in the morning that 32.8% of children felt stinky sometimes in their oral cavity. 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.[26]

More than half (53%) had never visited a dentist. Only around 28.5% had used the service of a dentist during the last 6 months and about 12.8% in the last 1 year. This was similar to the study done by Mirza et al in which 46% reported that they never visited the dentist. It was evident that just more than half of 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.[27]

Knowledge of sweets and fizzy drinks gave results similar to studies where students gave the right answer as bad for teeth.[21] Among the 10–12-year-olds, the percentage of students with appropriate knowledge was on par with the children. Our study was contraindicated with the studies in the past showing that girls had a better oral health practice than boys.[28,29] Our data suggest that the boys might be more cautious when it comes to self-care when compared to the girls. In the present study, we found that male children performed better than female children with regard to oral health practices.

Limitations

Firstly, the study design was cross-sectional; therefore, evidence regarding causal relationships could not be confirmed. Second, we used a self-report questionnaire for data collection and social desirability bias particularly regarding brushing practices may have affected the responses.

CONCLUSION

Oral hygiene practices were poor among school children; this could be attributed due to a lack of awareness, affordability, or non-utilization of dental care facilities by the children in the government schools. The study results concluded that oral hygiene practices were enhanced among male children when compared to female children and showed a positive attitude in preserving appropriate oral health. There is a need to increase oral health knowledge through well-planned and comprehensive educational programs in the school curriculum.

Recommendations

Implementation of community-based preventive oral health programs focused on a healthy diet and adequate oral hygiene practices should be promoted in school curricula and services to combat the growing dental caries problem.

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REFERENCES

1. Bandyopadhyay A, Bhuyan L, Panda A, Dash KC, Raghuvanshi M, Behura SS. Assessment of oral hygiene knowledge, practices, and concepts of tobacco usage among engineering students in Bhubaneswar, Odisha, India. J Contemp Dent Pract. 2017;18:423-8.
2. Pai NG, Acharya S, Vaghela J, Mankar S. Prevalence and risk factors of dental caries among school children from a low socio-economic locality in Mumbai, India. Age (in years). Int J Appl Dent Sci. 2018;9(10):104.
3. Mehta A. Trends in dental caries in Indian children for the past 25 years. Indian J Dent Res. 2018;29(3):323-28.
4. Gross Enrolment Ratios in Primary and Upper Primary Schools. Selected Educational Statistics, Ministry of Human Resource Development, Government of India. Infochange education. News and analysis on social justice and developmental issues in India. Available at: http://www.infochangeindia.org/education/statistics/gross-enrolmentratios-in-primary-and-upper-primary-schools.html. Accessed on 14 February 2022.
5. Ashok VG, Krishnaprasad C. A study on oral hygiene among school children in a rural area of Tamil Nadu. Int J Contemp Med Res. 2016;3:2798-9.
6. World Health Organization. Oral health information sheet. 2012. Available at: who int/oral

health/publications/factsheet/en/. Accessed on 08 February 2018.
7. Kwan SYL, Petersen PE, Pine CM, Borutta A. Health-promoting schools: an opportunity for oral health promotion. Bull World Health Org. 2005;83(9):677-85.
8. Petersen PE. The World Oral Health Report 2003. Continuous improvement of oral health in the 21st century- the approach of the WHO Global Oral Health Programme. Geneva, Switzerland: WHO. 2003 Available at: www.who.int/oral_health/media/en/orh_report03_en.pdf. Accessed on 14 February 2022.
9. Retna KN. Assessment of dental treatment required and analysis of cost in the management of dental caries among semiurban primary school children of Kerala. J Indian Soc Pedod Prev Dent. 2000;18(1):29-37.
10. Sukhabogi JR, Shekar C, Hameed IA, Ramana IV, Sandhu G. Oral health status among 12 and 15-year-old children from government and private schools in Hyderabad, Andhra Pradesh, India. Ann Med Health Sci Res. 2014;4:272-7.
11. Aravind SKK, Chandran A, Brinda J. Oral hygiene practices and knowledge among children of age 10-13 years in a private school in Chennai, South India. Int J Community Med Public Health. 2020;7:4093-9.
12. Sadana P, Nagpal M, Kaur S.Awareness of Oral Hygiene among Government School Children in a Rural Area of Amritsar, Punjab – A Cross-sectional Study. Ann Comm Health. 2020;8(2):41-5.
13. Mahfouz M, Abu Esaid A. Dental Caries Prevalence among 12–15-Year-Old Palestinian Children. Int Sch Res Notices. 2014;785404.
14. Pai NG, Acharya S, Vaghela J, Mankar S. Prevalence and risk factors of dental caries among school children from a low socio-economic locality in Mumbai, India. Age (in years). Int J Appl Dent Sci. 2018;9(10):104.
15. Goel R, Vedi A, Veeresha KL, Sogi GM, Gambhir RS. Oral hygiene practices and dental caries prevalence among 12- & 15-years school children in Ambala, Haryana -A cross-sectional study. J Clin Exp Dent. 2015;7(3):374-9.
16. Shailee F, Sogi G M, Sharma K R, Nidhi P. Dental caries prevalence and treatment needs among 12- and 15-Year-old schoolchildren in Shimla city, Himachal Pradesh, India. Indian J Dent Res. 2012;23:579-84.
17. Russel BA, Horowitz AM, Frazier PJ. School based preventive regiments and oral health knowledge and practices of sixth graders. J Public Health Dent. 1989;49(4):192-200.
18. Al-Ansari JM, Al-Jairan LY, Gillespie GM. Dietary habits of the primary to secondary school population and implications for oral health. J Allied Health. 2006;35(2):75-80.
19. Al-Tamimi S, Petersen PE. Oral health situation of schoolchildren, mothers and schoolteachers in Saudi Arabia. Int Dent J. 1998;48:180-6.
20. Rajab LD, Petersen PE Bakaeen G, Hamdan MA. Oral health behavior of school children and parents in Jordan. Int J Pediatr Dent. 2002;12(3):168-76.
21. Chester RK, Huntington E, Burchell CK, Stephen KW: Effect of oral care habits on caries in adolescents. Caries Res. 1992;26:299-304.
22. Lian CW, Phing TS, Chat CS, Shin BC, Baharuddina LH, Jalil ZB. Oral health knowledge, attitude and practice among secondary school students in Kuching, Sarawak. Arch Orofac Sci. 2010;5:9-16.
23. Gordon C, Roberts C. HBSC Briefing Series: 4 Eating Habits and Oral Health. Health Promotion Division, Office of the Chief Medical Officer. Cardiff: Welsh Assembly Government. 2005.
24. Al-Sadh an SA. Oral health practices and dietary habits of intermediate school children in Riyadh, Saudi Arabia. Saudi Dent J. 2003;15:81-7.
25. Hon Kala S, Hon Kala E, Rim Pela A, Vik at A. Oral hygiene instructions and dietary sugar advice received by adolescents in 1989 and 1997. Community Dent Oral Epidemiol. 2002;30:124-32.
26. Detels R, Tan CC. The scope and concerns of public health. Oxford Textbook of Global Public Health, 6th edition. Oxford University Press. 2015;1033-8.
27. Mirza BA, Syed A, Izhar F, Ali Khan A. Oral health attitudes, knowledge, and behavior amongst high and low socioeconomic school going children in Lahore, Pakistan. Pak Oral Dent J. 2011;31:396-401.
28. Mehta A, Kaur G. Oral health-related knowledge, attitude, and practices among 12-year-old schoolchildren studying in rural areas of Panchkula, India. Ind J Dent Res. 2012;23:293.
29. Al-Samdani KH, Ahmad MS, Baker HA, Elanbya MOG, Others. Oral health knowledge and practice among 9-12-year-old schoolchildren in the region of Madinah, Saudi Arabia, and its impact on the prevalence of dental caries. Eur J Gen Dentistry. 2017;6:54.

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