

Original Research Article

Prevalence of common oral health problems among school going children aged 12-15 years in a rural block of Haryana: a cross-sectional study

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ABSTRACT

Background: Oral diseases among children are a significant public health problem as it can affect the physical, mental and social dimensions of the individual. It can adversely affect the attendance and performance of the child in schools and attendance of the parent in the workplace as well. To estimate the prevalence of oral health problems among school going children aged 12-15 years in a rural block of Haryana.

Methods: A school based cross-sectional study was conducted in government middle and high school. A pre-designed and pre-tested proforma was used for collecting the information. Oral examination was carried out under daylight using a mouth mirror, oral probe and torch (when required), with the child in a sitting position within the school premises in the presence of school authorities. Data was analyzed by using percentages.

Results: Dental caries (48%) emerged as the most common condition, followed by deposits on tooth (46.1%) and fluorosis (43.6%). Other conditions included dental aches (13.8%), foul smell (10.8%), interdental spacing (4.7%), retained deciduous teeth (2.7%), fractured teeth (2.2%), tongue problems (1.6%) and gum problems (0.8%).

Conclusions: The overall pattern indicates a substantial burden of preventable oral conditions among school going adolescents.

Keywords: Dental caries, Fluorosis, Oral health problems, School children

INTRODUCTION

Oral diseases are one of the most common non communicable diseases across all age groups of the population. Though oral diseases have negligible mortality rate, the morbidity can be very high in terms of reduced quality of life, disability adjusted life years (DALY), time and money spent towards the treatment. Oral diseases among children are a further significant public health problem as it can affect the physical, mental and social dimensions of the individual. It can adversely

affect the attendance and performance of the child in schools and attendance of the parent in the workplace as well.¹ Oral pain has devastating effects on children like sleep loss, poor growth, behavioral problems and poor learning.

Developmentally crucial processes of communications, socialization and self-esteem are also affected.² Adolescents aged 12 to 15 years, in particular, undergo numerous changes, like physically, socially and psychologically that impact their oral health.

Unfortunately, a significant proportion of this age group experiences various oral health problems which if left unaddressed, may persist into adulthood, leading to lifelong complications. Self-esteem can be understood as sum of one's self confidence, self-worth and self-respect. Oral health being an integral part of general health can also influence the level of self-esteem.

Oral health has a profound effect on systemic health. There is an increased risk of infective endocarditis, digestive problems, cardiovascular disease, stroke and bacterial pneumonia in future year of life in individuals with poor oral health. A direct relationship between cardiovascular diseases and oral infections like periodontitis has been observed.³

India, a developing country, faces many challenges in rendering oral health needs. The majority of Indian population resides in rural areas. It is necessary to know the prevalence and distribution of oral health problems. Such information is basic for formulation of oral health policies and appropriate programs.

The appropriate policies and programs will facilitate in improving awareness and knowledge of the general public about the preventive and promotive aspects of oral health as well as, to create the required services and train the necessary dental manpower to meet these needs. The children in schools are relatively easily accessible, compared to any other population groups for any health promotion programs aimed at effecting the lifestyle changes.⁴

Students aged 12–15 years undergo transition from mixed to permanent dentition. This critical period determines the oral health status in adulthood and is also the pivotal stage of establishment of oral health concepts and behaviors.⁵ Considering the fact and paucity of data regarding prevalence of oral health problems particular in this rural area of Haryana, this study was planned with objective to estimate the prevalence of oral health problems among school children aged 12-15 years in rural block of Haryana.

METHODS

Taking operational feasibility into consideration this study was conducted in government co-ed middle and high schools situated in block Agroha of district Hisar, Haryana. This cross-sectional study was carried out from July 2024 to June 2025. Study participants were school children aged 12-15 years of government co-ed middle and high schools of block Agroha.

Sample size calculation: Considering the prevalence of one of oral health problem i.e., dental caries as 54% and allowable error of 10% of prevalence at 95% confidence interval, sample size was calculated as 327 and considering a 10% non-response rate, the final sample

size was increased to 360 (327 + 33). Thus, a total of 360 participants were included in the study.

Inclusion criteria

Students aged 12–15 years who were present on the day of examination and were willing to participate in the study. Students whose parents/guardians gave consent for participation of their wards in the study.

Exclusion criteria

Uncooperative students. Students having developmental anomalies or any condition which prevented proper oral hygiene maintenance.

Sampling technique

A two-stage simple random sampling technique was used for the selection of study participants. As per the list obtained from the Block Education Officer (BEO), a total of 13 government co-educational schools (4 middle schools and 9 high schools) were located in block Agroha.

Initially, 2 government co-educational middle schools and 4 government co-educational high schools were selected randomly by the lottery method. Subsequently, a list of all students aged 12–15 years was prepared from school records and 60 students were selected randomly from each school by the lottery method. A pre-designed and pre-tested proforma was used for collecting the information.

Data collection and analysis

Before conducting the study, written permission was obtained from the Block Education Officer and the concerned school authorities. After explaining the purpose and details of the study to the participants, written informed consent was obtained from parents/guardians and informed assent was obtained from the study participants.

All students were given an introductory health talk regarding healthy tooth brushing methods and general oral hygiene practices. Oral examination was carried out under daylight using a mouth mirror, oral probe and torch (when required), with the child in a sitting position within the school premises in the presence of school authorities.

The investigator received two weeks training in orodental examination in the Department of Dentistry, Maharaja Agrasen Medical College (MAMC), Agroha, Hisar, Haryana. The data were analyzed by using Statistical Package for Social Sciences software (SPSS version 25.0). Written permission was obtained from the Institutional Ethics Committee for Human Research of the institute.

RESULTS

Table 1 shows school-wise distribution of study subjects. Out of total 174 (48.3%) students were boys and 186 (51.7%) students were girls. Total 120 (33.3%) students (60 boys and 60 girls) belonged to middle schools and 240 (66.7%) students (114 boys and 126 girls) belonged to high schools. Table 2 shows only among students belonged to 12 years age girls (46%) were more than boys otherwise percentage wise girls were lesser in higher age group as compare to boys. Figure 1 shows prevalence of common oral health problems among study subjects (%). Table 3 shows prevalence of common oral health problems among study subjects. Out of 360 students, most common oral health problem found was dental caries (48%) followed by deposits on tooth (46.1%), fluorosis (43.6%), dental aches (13.8%), foul smelling (10.8%), inter dental spaces (4.7%), retained deciduous teeth (2.7%), fractured teeth (2.2%), tongue problems (1.6%) and gum problems (0.8%).

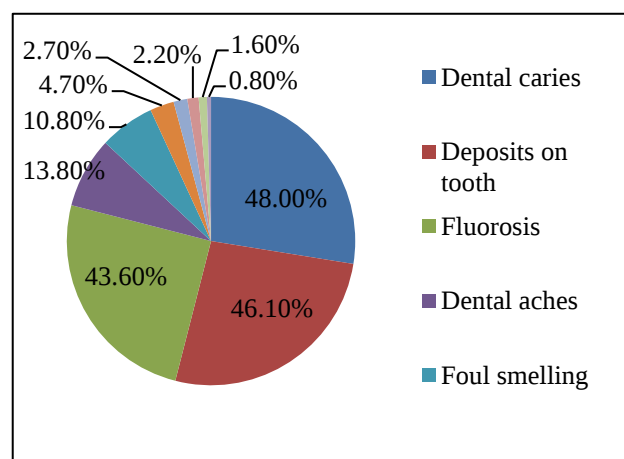


Figure 1: Prevalence of common oral health problems among study subjects (%).

Table 1: School-wise distribution of study subjects.

School	No. of students N (%)		Total
	Boys	Girls	
Middle Schools	60 (34.5)	60 (32.3)	120 (33.3)
High Schools	114 (65.5)	126 (67.7)	240 (66.7)
Total	174 (48.3)	186 (51.7)	360 (100)

Table 2: Age and sex-wise distribution of study subjects.

Age groups (in years)	Study subjects N (%)		Total N (%)
	Boys	Girls	
12	56 (32.1)	86 (46.0)	142 (39.4)
13	49 (28.2)	48 (25.0)	97 (29.9)
14	36 (20.7)	31 (16.0)	67 (18.6)
15	33 (19.0)	21 (11.0)	54 (15.0)
Total	174 (100)	186 (100)	360 (100)

Table 3: Prevalence of common oral health problems among study subjects (n=360).

Common oral health problems	Total N (%)
Dental caries	173 (48.0)
Deposits on tooth	166 (46.1)
Fluorosis	157 (43.6)
Dental aches	50 (13.8)
Foul smelling	39 (10.8)
Inter dental spaces	17 (4.7)
Retained deciduous teeth	10 (2.7)
Fractured teeth	8 (2.2)
Tongue problems	6 (1.6)
Gum problem	3 (0.8)

DISCUSSION

In the study, dental caries (48%) emerged as the most common condition, followed by deposits on tooth

(46.1%) and fluorosis (43.6%). Other conditions included dental aches (13.8%), foul smell (10.8%), interdental spacing (4.7%), retained deciduous teeth (2.7%), fractured teeth (2.2%), tongue problems (1.6%) and gum problems (0.8%). The overall pattern indicates a

substantial burden of preventable oral conditions among adolescents.

The 48% prevalence of dental caries observed here is comparable with the pooled national estimate of about 52–54 % reported in the meta-analysis by Pandey et al and similar levels have been recorded in other Indian studies, such as Kumar et al (47.2%).⁷ Higher rates have been reported from Tamil Nadu (Parasuraman et al 63.9%), Chidambaram (Kuzhali et al 58.8%), Haldwani (Garkoti et al, 58.18%), Mathura city (Arora et al 57%), Pallikaranai, Chennai (Arangannal et al 68.8%).^{6,8} Lower rates with the 22.4% prevalence found by Singh et al, in an east Delhi resettlement colony, Gupta et al in Bangalore city reported 33.65% caries prevalence, Praveena et al in Sullia Taluk, Karnataka reported 33.6% caries prevalence and also from international settings such as China (Zhang et al 38.6%).^{5,9-15} In the present study, dental deposits (46.1%) were present in almost half of the participants, an early marker of poor plaque control and potential future periodontitis is comparable with the other Indian studies, such as Hussaini et al, where the prevalence of dental deposit reported 41.14%.¹⁶

In the present study, gum problems was low (0.8 %), but this is likely an underestimate since a one-time school screening may miss mild inflammation, as pointed out by Sun et al, who documented unhealthy periodontal conditions in 92.6 % of 15 years olds despite relatively low caries rates.¹⁷ Study done by Hussaini et al reported 26.72% adolescents have gum problems, Jose et al reported in rural Kerala that 15% had gingivitis and by Singh et al, in an east Delhi resettlement colony reported 33.7% children with gums problems.^{13,16,18} Parasuraman G et al, identified 9.8% of children reporting bleeding gums.¹⁹ The lower percentage in our study may reflect the use of visible signs only. Study by Zhang et al reported 70.2% gingival bleeding in Gansu province of China.⁵

The 43.6 % prevalence of dental fluorosis was observed in this study. In Haryana state, almost all districts except 6 (Panchkula, Yamunanagar, Ambala, Kurukshetra, Kaithal and Panipat) have ground water with medium to high fluoride concentration (Shyam et al). Similar observation 41.1% by Shetty et al in Chikkaballapur. Chronic ingestion of excess fluoride during tooth development leads to hypomineralised enamel, aetiology described in the WHO guidance.^{20,21} Higher rates with the 96.6% prevalence found by Shyam et al in 11 14 years old school children in endemic fluoride areas of Haryana and 69.4% prevalence found by Chandrashekar et al, in 12-15 years old school children in rural areas of Davangere.^{20,22} Lower rates with the 15.8% prevalence found by Baskaradoss et al in 11-15 years old school children of Kanyakumari District, Tamilnadu, Saravanan et al, reported 31.4% fluorosis prevalence in rural areas of Chidambaram taluk, Cuddalore District, Tamil Nadu.^{23,24} These comparisons underscore the environmental determinants of fluorosis and mirror the findings.

In the present study, dental aches were observed in 13.8 % of study population. Higher levels of dental aches reported in study done by Parasuraman et al (20.4%).¹⁹ In the present study, 4.7% childrens reported interdental space however higher rate (20.12%) of interdental spaces seen in study done by Hussaini et al.¹⁶

Study done by Hussaini et al reported 15.31% adolescents have foul smelling.¹⁶ In the present study, the prevalence of foul smelling is 10.8%, which is less than the observations from other surveys. Lower prevalence of foul smelling reported by Singh et al (2.6%) in an east Delhi resettlement colony.¹³ In the present study, 2.7% children reported retained deciduous teeth which is lower than study done by Jose et al (7%) in rural Kerala.¹⁸

In the present study, 2.2% children reported fractured teeth which is lower than study done by Jose A et al, (4%) in rural Kerala.¹⁸ Lower rates of fractured teeth reported by Singh et al, (0.7%) in an east Delhi resettlement colony.¹³

The observed differences in different studies possibly due to study done in different geographical areas.

Limitations

As the study followed a cross-sectional design, causal relationships between oral health problems and associated factors could not be established. The study was conducted only in government co-educational schools of a single rural block, which limits the generalizability of the findings to other rural or urban settings. Oral examinations were conducted under field conditions, which may have limited the detection of early or subclinical oral lesions.

CONCLUSION

The present study revealed a high prevalence of dental caries, deposits on teeth and dental fluorosis among school-going children in a rural block of Haryana. The findings highlight the need for regular school-based oral health screening and education for school children.

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Conflict of interest: None declared

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

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