

*Original research*

## **Prevalence of dental caries among 12-15 years old school children in Ambala district of Haryana state.**

Goel R , Vedi A, Goyal P, Veerasha K L, Sogi G M

**ABSTRACT**

**Objectives:** To assess and compare the prevalence of dental caries among school children aged 12 to 15 years in government and private schools of Ambala district of Haryana state, India and to provide a baseline data for planning and evaluation of oral health care promotion programmes. **Materials and Method:** A cross-sectional descriptive survey to assess the caries prevalence was conducted on 2010 school children aged 12 to 15 years in Ambala district. The data were collected by means of clinical examination using the criteria of Dentition Status. The student's t-test and one way ANOVA were used for statistical analysis. **Results** - Children aged 15 years (46.5%) were having higher prevalence of dental caries compared to 12 years old (34.3%) which was statistically significant ( $p < 0.05$ ). Females (45%) demonstrated higher caries prevalence than males (41.5%). Mean DMFT ranged from 0.82 to 1.26. **Conclusion** - The observations of this study indicate the need for a school oral health promotion programme to sustain the healthy practices in this growing population. The overall prevalence of dental caries was low and close to that observed with the national study.

Key Words: Cross Sectional; Dental Caries; Prevalence; School Children; Descriptive: Statistics.

**INTRODUCTION**

Worldwide, large variations in the trends with regards to the prevalence and the severity of dental caries have been reported. An estimate of 5 billion people experience the disease which presents various forms of discomfort at different stages of its clinical presentation.<sup>1</sup> Some countries recorded that almost no child was free from caries.<sup>2</sup> Children who suffer from poor oral health are 12 times more likely to have more restricted activity days including missing schools than those who do not.<sup>1</sup> More than 50 million hours annually are lost from school due to oral diseases.<sup>3</sup>

While there has been improvement in oral health of children in last few decades, tooth decay remains one of the most common childhood diseases, in both industrialised and developing countries. A substantial portion of children in many developing countries are affected by tooth decay<sup>1</sup> and most decay is left untreated due to limited access to oral health services. India is the country with 115 crore population out of which 32% are below the age of 14 years.<sup>4</sup>

A very extensive and comprehensive National Health Survey conducted in 2004 throughout India has shown the dental caries

prevalence as follows: 53.5% in 12 years old children and 63.1% in 15 years old children. The report concluded that a preventive programme should be started to address this crisis in dental caries.<sup>5</sup> It is impossible to think of secondary and tertiary care to the population of our country due to huge population and less resource for health care.

Investment in schools is intended to yield benefits to individuals, community and nations. The school years cover a period that runs from childhood to adolescence. These are influential stages in people's lives when lifelong substantial oral health related behaviours, as well as beliefs and attitudes, are being developed. Children are particularly receptive during this period and the earlier the habits are established, the long lasting the impact. India had 6,51,382 primary schools; 2,45,274 middle schools and 1,37,207 high/higher secondary schools. About 60% of the students go to government and the remaining 40% to private schools.<sup>6</sup>

It is necessary to know the prevalence of oral health problems and understand dental health practices among the people particularly in the young age group. Owing to dearth of literature on prevalence of dental caries among school children in Ambala, this study was conducted to assess and compare

the prevalence of dental caries among school children aged 12 to 15 years in government and private schools of Ambala district of Haryana state, India and also to establish a reliable baseline data for planning and development of national or regional oral health programmes.

## MATERIALS AND METHOD

A cross sectional descriptive study was conducted among the school going children aged 12 to 15 years at Ambala. Ambala district is one of the 21 districts of Haryana state in India. It comprises of 3 tehsils namely Ambala, Naraingarh and Barara. Entire district has both private as well as government schools and are all well equipped. The total population of the district according to 2001 census is 10,13,660 of which the male population accounted for 5,42,366 and female for 4,71,294. The population of the district forms 4.8 percent of the total population of the Haryana state. The literate population is 6,73,807 out of which 3,90,012 are males and 2,83,795 are females respectively. The sex ratio is 869 and the density of population is 644/km square.<sup>7</sup>

### *Official Permission, ethical clearance and informed consent:*

The study protocol was reviewed by the Institutional Review Board and was granted ethical clearance. An official permission was obtained from the District Education Officer and also from all the representative schools in Ambala. After explaining the purpose and details of the study, a written informed consent was obtained from the parents of all children who fulfilled the eligibility criteria and were willing to participate in the survey.

### *Training and Calibration:*

Before the commencement of the study, training and intraexaminer calibration was done by the staff of the Department of Public Health Dentistry in the school premises (kappa value = 95%).

### *Pilot Survey:*

A pilot study was carried out among 100 children, 12 and 15 years old from one government and one public school to

determine the feasibility of the study. Depending on the prevalence obtained, 95% confidence level and 5% allowable error, the sample size was determined to be 2010.

### *Sampling technique:*

The sample frame consisted of middle and high schools (government and private) in Ambala and the list was obtained from District Education Office. Study sample was recruited by a two-stage cluster sampling technique. For study purpose, the entire district was divided into 6 blocks for administrative purpose, consisting of various high schools. Schools from each block were randomly selected to obtain the desired sample size, such that there was an equal representation from all the blocks. In the second stage, eligible schoolchildren were stratified according to age and gender, and randomly selected in proportion to the total number of 12 to 15 years old students enrolled in each school to reach the sample of 2010. All the students present on the day of examination were examined. Children with systemic diseases and on antibiotic therapy in the previous six months were excluded from the study.

### *Methodology:*

Data collection was carried out by a single investigator in order to simplify the operational process of data collection who was assisted by a recording assistant. A total of 2010 subjects were examined over a period of 14 months (July 2009- September 2010). Data regarding general information, oral hygiene practices were obtained through interview and recorded on a proforma. Clinical examination (Type III) for dental caries was done according to Dentition Status using mouth mirror and Community Periodontal Index (CPI) probe as described in WHO Oral Health Survey Basic Methods 1997.<sup>8</sup> Radiographs were not used for diagnostic purpose. To reduce the examiner's bias, duplicate examination was conducted on 5% (n = 100) of the population during the course of the study.

### *Statistical Analysis:*

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois,

USA). Descriptive statistics included computation of percentages, means and standard deviations. The student's t-test and one way ANOVA were used for analysis. For all tests, confidence interval and p-value were set at 95% and 0.05 respectively.

**RESULTS**

Among 2010 subjects examined 1142 (56.9%) were males and 868 (43.1%) were females. The subjects age range was 12 to 15 years with a representation of 236 (11.8%), 456 (22.7%), 562 (28%) and 756 (37.7%) children respectively [Table 1].

*Table 1. Distribution of study subjects according to age and gender.*

Age (years)	Male		Female		Total	
	N	%	n	%	n	%
12	126	11.0	110	12.7	236	11.8
13	259	22.7	197	22.7	456	22.7
14	319	28.0	243	28.0	562	28.0
15	438	38.3	318	36.7	756	37.7
Total	1142	56.9	868	43.1	2010	100

It was found that dental caries was higher among 15 years age group 46.5%, followed by 43.2% in 14 years, 41.2% in 13 years and 34.3% in 12 years [Table 2]. Out of 2010 subjects, 42.9% (864) subjects had dental caries. Females had higher prevalence of dental caries (45%) as compared to males (41.5%).

The highest mean DMFT was 1.26 in 15 years age group followed by 1.15 in 13 years, 1.05 in 14 years and 0.82 in 12 years of age group. Females had a highest DMFT count of 1.20 as compared to males 1.07. The prevalence was statistically significant with regard to age only (P=0.003).

**DISCUSSION**

The method proposed in the present study allowed us to explore the prevalence of dental caries among the children residing in Ambala district. The use of a randomized sample represented an important contribution for the comprehension of the oral health-disease process among the

children, since the majority of the national studies that focused on this population group were restricted to convenience samples. The 12 and 15 age group were chosen for this study, as these are global monitoring ages for dental caries for international comparisons and monitoring of disease trends.<sup>8</sup> The school going children were targeted because of the ease of accessibility.<sup>9</sup>

*Table 2. Prevalence of dental caries according to age and gender.*

Variables	Children affected with caries		DMFT		P value
	n	%	Mean	SD	
<b>Age (in years)</b>					
12 (n=236)	81	34.3	0.82	1.525	0.003*
13 (n=456)	188	41.2	1.15	1.792	
14 (n=562)	243	43.2	1.05	1.550	
15 (n=756)	352	46.5	1.26	1.745	
<b>Gender</b>					
Male (n=1142)	473	41.5	1.07	1.611	0.047
Female (n=868)	391	45	1.20	1.773	
Total (n=2010)	864	42.9	1.12	1.684	

*Test Used – t-test and one-way ANOVA (\* indicates statistically significant difference in between the groups at p < 0.05).*

It was found that the prevalence of dental caries among the study subjects ranged from 34.3% to 46.5% which showed an increasing trend with increase in age. This is quite normal as the DMFT is a cumulative index. Similar findings are reported by Naidu et al (2006)<sup>10</sup> and Goyal et al (2007).<sup>11</sup> This is lower to that reported by Sunayana et al (2005)<sup>12</sup> and higher than the findings reported by Damle and Patel (1994).<sup>13</sup> The reason may be attributed to caries being a continuous and cumulative process and also the increase in the number of teeth due to eruption with advancing age.

In 12 and 15 years age groups the mean DMFT was 0.82 and 1.26 respectively, which is lower to that reported by Damle and Patel (1994).<sup>13</sup> The similar results were also reported by Naidu et al (2006).<sup>10</sup> and Munjal et al (2013).<sup>14</sup> But the only study reporting lower caries prevalence in Punjab at Faridkot could probably be due to

Faridkot being situated in high fluoride belt region.<sup>15</sup>

Females accounted for higher mean DMFT (1.20) in our study population, which is lower to that reported by Musset et al (1991).<sup>16</sup> Similar results of females exhibiting a higher mean DMFT than males are reported in studies done by Dummer et al (1987),<sup>17</sup> Singh et al (1999)<sup>18</sup> and Sogi and Bhaskar (2001).<sup>19</sup> This finding could be because of the earlier eruption of teeth which lead to prolonged exposure of these teeth to oral environment in females.<sup>20</sup>

Dental caries is common in children and the relationship with primary physical causes that includes inadequate dental hygienic activities and other causes like frequent consumption of sweets and salivary buffering is complex and requires further investigation which may be a limitation in this study. Parents and teachers training programmes provide a useful insight into improving the oral health of children and also moving closer to WHO goals of oral health (Sanei and Nasrabadi, 2005).<sup>21</sup>

## CONCLUSION

It is concluded from the present study that caries experience increases with age. Females experienced more decay as compared to males. Exploring these links between clinical conditions and their personal social outcomes promotes a more complex appreciation to identify intervention to minimize the consequences of oral disease by conducting school dental health programmes. Sequentially, a systematic endeavour to enhance the preventive approach as a component of oral health promotion programme should be undertaken.

**Acknowledgement:** The authors would like to thank the study participants for their participation and kind cooperation throughout the study.

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## REFERENCES

1. WHO information series on school health: Document Eleven: Geneva 2003.
2. World Health Organization. Educational imperatives for oral health personnel: change or decay. 1990, Geneva, WHO.
3. Park K. Parks: Text book of Preventive and Social Medicine: 20<sup>th</sup> edition: Jabalpur: Banarasi Das Bhanot publishers 2009.
4. Census of India. <http://censusindia.gov.in/2011census/censusinfodashboard/>
5. National Oral Health Survey and Fluoride mapping. New Delhi: Dental Council of India, 2002–2003: 107–21.
6. Website for total no of school. [http://en.wikipedia.org/wiki/Education\\_in\\_India](http://en.wikipedia.org/wiki/Education_in_India)
7. Ambala. Ambala at a glance. WWW. "<http://en.wikipedia.org/wiki/Ambala>":
8. Oral Health Surveys, Basic methods. 4<sup>th</sup> edition, World Health Organization, Geneva, 1997.
9. Mittal M, Chaudhary P, Chopra R, Khattar V. Oral health status of 5 years and 12 years old school going children in rural Gurgaon, India. J Indian Soc Pedod Prev Dent 2014;32(1):3-8.
10. Naidu R, Prevatt I, Simeon D. The oral health and treatment needs of schoolchildren in Trinidad and Tobago: Finding of National Dent 2006;16:412-418.
11. Goyal A, Gauba K, Chawla HS., Kaur M, Kapur A. Epidemiology of dental caries in Chandigarh school children and trends over the last 25 years. J Indian Soc Pedod Prev Dent 2007;25:115-118.
12. Sunayana G, Joseph J, Saravanan S, Arumugham IM: Prevalence of dental caries among 12 and 15 years old school children in Chennai city: Journal of Indian Soc Pedo Preventive Dentistry 2005; 13: 17-22.
13. Damle SG, Patel AR. Caries prevalence and treatment need amongst children of Dharavi Bombay, India: Community Dent Oral Epidemiol 1994; 22: 62-63.
14. Munjal V, Gupta A, Kaur P, Garewal R. Dental caires prevalence and treatment

- needs in 12 and 15 year old school children of Ludhiana city. Indian J Oral Sci 2013;4:27-30.
15. Singh S, Kaur G, Kapilla VK. Dental disorder in primary school children of Faridkot city. J Indian Dent Assoc 1985;57:304-305.
  16. Obry-Musset AM., Cahen P-M., Frank RM., Baker B. Dental caries and oral hygiene among 12 years old children in Martinique France: Community Dent Oral Epidemiol 1991; 19: 54-55.
  17. Dummer MH, Addy M, Hicks R, Kingdom A. The effect of social class on the prevalence of caries, plaque, gingivitis and pocketing in 11-12 year old children in south wales. J Dent 1987;15:185-190.
  18. Singh AA, Singh B, Kharbanda OP, Shukla DK, Goswami K, Gupta S. A study dental caries in school children from rural Haryana. J Indian Soc Pedod Prev Dent 1999;17:24-28.
  19. Sogi GM, Bhaskar DJ. Dental caries and oral hygiene status of 13-14 year old school children of Davangere. J Indian Soc Pedod Prev Dent 2001;19:113-117.
  20. Kaul S, Saini S, Saxena S. Emergence of permanent teeth in school children in Chandigarh, India. Arch Oral Biol 1975;20:587-593.
  21. Sanei AS, Nasrabadi AN. Periodontal health status and treatment needs in Iranian adolescent population. Arch Iranian Med 2005; 8(4): 290-294.

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**How to cite this article:** Goel R , Vedi A, Goyal P, Veerasha K L, Sogi G M. Prevalence of dental caries among 12-15 years old school children in Ambala district of Haryana state. J Dent Res Updates 2014 Dec;1(1):1-5

**Sources of support:** Nil

**Conflict of Interest:** None declared