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Original Research Article

Prevalence of dental caries among government primary school children: a cross-sectional study

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ABSTRACT

Background: Oral health is fraction of the whole health portion. The causal link connecting oral and complete disease has been revealed in recent years. Oral wellbeing has also affected the quality of life deeply. The extremely prevalent diseases in many communities include dental cavities and parodontal diseases. Once they happen, and even with complex etiology, they are rather irreversible. While there are primary preventive strategies, they do not offer maximum security.
Methods: A total of 200 school children were selected randomly and dental caries assessment was recorded according to DMFT/DMFS indices.
Results: Dental Caries was found to be 76 (38.0%) with mean DMFT scores 2.22±2.404 and mean DMFS scores 5.46±7.242, gender wise DMFT scores of school children is 2.22±2.404 and DMFS scores of school children is 5.46±7.242. The highest prevalence of dental caries 48.8% (mean dmft 2.27) was seen in 10-year children, followed 45.7% (mean dmft 1.69) was seen in 6-year children, 37.0% (mean dmft 2.3) was seen in 8-year children, 31.4% (mean dmft 2.26) was seen in 9-year children and lowest prevalence of dental caries 27.9% (mean dmft 2.49) was seen in 7-year children and females with 42.7% (mean dmft 2.15) and males with 32.2% (mean dmft 2.15).
Conclusions: There is an urgent need to change from restorative dental services to preventive oriented dental services for government primary school children to improve the oral health status.

Keywords: Dental caries, DMFT/DMFS, Schoolchildren, Kolar

INTRODUCTION

Oral wellbeing implies more than teeth and it is necessary part broad wellbeing and fundamental for prosperity. The craniofacial complex permits children to talk, grin, kiss, contact, odor, flavor, bite, consume, and to shout out in torment. Simultaneously gives security against microbial contaminations and ecological dangers. Oral medical problems contain exercises in school, vocation and residence, leading to many hours of school and work every year around the world. Furthermore, the psychosocial effect of these diseases often reduces personal satisfaction. New investigate recommends that the wellbeing of our oral cavity reflects the state of our body overall, for example at the point when our mouth is solid; our wellbeing would be acceptable and on the off chance that we have deprived oral wellbeing, we may include additional medical issues. Investigation shows that great oral wellbeing might really keep few maladies from happening.[1]

Dental caries can lead to dental pulp and related tissue swelling, which gradually results in tooth loss, cellulite and seldom brain abscess. Oral streptococci believed to be associated with systemic disorders such as

endocarditic, meningitis; hepatitis conditions and vertebral osteomyelitis are known to be causing bacteria with dental caries. Dental caries is a weakening condition that may cause severe pain to school children. The condition will result in more complications, including sepsis, if left untreated. Serious untreated cavities have also been reported as being related to general health and well-being that influence the weight and development of young children. Dental caries is uncomfortable, costly and can impair a child's diet and oral health.[2]

Oral health is fraction of the on the whole health portion. The causal link connecting oral and complete disease has been revealed in recent years. Oral wellbeing has also affected the quality of life deeply. The extremely prevalent diseases in many communities include dental cavities and parodontal diseases. Once they happen, and even with complex etiology, they are rather irreversible. While there are primary preventive strategies, they do not offer maximum security.[3] The 2017 Global Disease Burden report assessed that nearly 3.5 billion people around the world had an effect on oral illness and that feverish teeth are the most frequently known conditions. Worldwide, 2.3 billion people are judged to suffer the harmful effects of permanent teeth caries and over 530 million children experience the harmful effects of critical teeth caries. With growing urbanization and the everyday conditions, the prevalence of oral diseases in countries that pay low-and-center wages generally continues to rise. Essentially because of low fluoride deposit (e.g. toothpaste) and poor access to oral social security benefits on the network in water and oral cleanliness. Subjects that contribute to oral welfare and other non-communicable disorders, such as cigarettes and liquor, have been found to be high in sugar.[4]

About 2.43 billion people globally are facing inevitable tooth decay (36 percent of the world population). This affects 620 million or 9% of the population of infants. In Latin American, Middle Eastern and South Asian countries, and less in particular in China, the disease is the most common disease. The most common chronic disease in children in America is dental caries at slightest five period additional than asthma. Pathological is the main root of loss of dentures in kids.[5] The incidence of dental caries rises in developing countries like India because of shifting lifestyles and dietary habits. The Indian government introduced a national scheme called Integrated Child Development Services, designed to provide a variety of fundamental health services through various officials. A worker from anganwadi primarily provides services in non-formal education and healthcare for children under the age of six. Oral diseases remained a problem for the public health of developed and a burden particularly among the rural population for developing countries such as India. India, with about 69 percent of its population, is mainly rural. In Indian, dental caries (50 percent) at 5 years of age, (52.5 percent) at 12 years of age, and (61.4 percent) at 15 years of age is very high in the National oral health policy.[6]

Dental caries is a very young age-old disorder. Children who are disadvantaged, however, have proved to be the most vulnerable, regardless of race, ethnicity or culture. In India, dental cavities range from 19.2 percent to 71.1 percent among pre-school children.[7] However, an average prevalence of 40.5% in the state of Karnataka and 40%-60% in the country was shown by the 2018 National oral health report.[8] The district of Kolar is a geographical region situated in the state of Karnataka on the Andhra Pradesh-Tamil Nadu frontier. Many of the people who remain here have a lower socio-economic position. Karnataka State has several zones with high drinking water fluoride levels. There are also areas of skeletal and dental fluorosis in the district of Kolar. No current research was done in this area to show the prevalence of dental caries and thus the prevalence of dental caries in the Kolar government primary school children was determined by a study. The present study was conducted to assess prevalence of dental caries among Government primary school children of Kolar district.

METHODS

Current cross sectional study was under taken with the aim of assessing the prevalence of dental caries among Government primary school children. Only children between the age group of 6 and 10 years were included in the present study. A total of 200 selected Children from nine government primary school of Kolar district were included under study. Permission to conduct the study was granted by the authorities while consent from the parents and children was obtained through the head of schools. School authorities and parents were notified prior to the study and dental examination dates so that maximum number of students can avail the opportunity.

The children were examined at school by the investigator who was trained and certified to carry out dental caries assessment with the help of DMFT/DMFS at Sambhram dental college KFG. After obtaining demographic details of sample, the children were subjects for dental screening; Mouth mirror, probe, and explorer were used for carrying out the dental examination in the classroom under natural light with the children seated on a stool and the examiner seated on a chair behind the subject. The WHO method and criteria were used for recording caries prevalence, DMFT/DMFS of both milk and permanent teeth of school children. Data collection was carried out for a period of two months from December 2020 to January 2021. This data were entered into the excel sheets and analyzed using SPSS for windows, Version 16.0, Chi-square test was used for the evaluation of the level of significance.

DMFT/DMFS index used for assessment of dental caries

This standardized measurement tool has been widely used for many decades and is universally accepted and applicable. The index is simple, rapid and versatile based on the fact that the dental hard tissue. Children underwent

dental assessment for decay occurrence as per the WHO's caries diagnostic criteria to determine the DMFT (decayed, missing, filled teeth) index (WHO, 1997).

Exclusion criteria

The following exclusion criteria is considered according to WHO caries diagnostic criteria to classify the DMFT; supernumerary teeth exclusion, the third molars were excluded, a tooth could be restored many times, but it was a single tooth, F, on one surface a tooth may be restored and on another a decayed D must be considered, no tooth, DMF or sound shall be numbered more than once.

Procedure

In current study code D was used to describe decayed teeth, M was used to describe missing teeth Used to describe, F was used to describe teeth that has been previously filled due to caries, T was used to count number of affected teeth and S was used to describe number of affected teeth surface. Instrument used in current study were mouth mirror and explorer (sharp standard number 23 explorer).

Rules for DMF Index

No tooth more than once should be registered, filled, decayed teeth should be registered separately, a tooth can be restored many times, but is called one tooth, it should be counted as missing just the teeth lost due to caries and persistent decay should be considered decay for restored teeth

Criteria for identifying dental caries

Criteria for identifying dental caries were clinically apparent and apparent lesion, explorer tip penetrates soft material, transparent discoloration or loss typical of the damaged or dematerialized enamel and explorer tips in fits or cracks or resists removal if there is moderate insertion into firmness and the area is faint.

RESULTS

The present study was conducted to assess prevalence of dental caries among Government primary school children of Kolar.

Socio demographic variables of the studied school children

School children according to their age as depicted in (Table 1) indicates that higher % of government school kids 46 (23%) were in the age of 8 years and lowest 35 (17.5%) were in the age of 6 and 9 years respectively. School children according to their gender as depicted in (Figure 1) indicate that higher % of government school children 110 (55%) were girls and lowest 90 (45%) were boys, whereas higher % of private school children 135 (67.5%) were boys and lowest 65 (32.5%) were girls.

Table 1: Frequency along with% distribution of children according to their age (n=200).

Age (years)	Frequency	%
6	35	17.5
7	43	21.5
8	46	23.0
9	35	17.5
10	41	20.5
Total	200	100

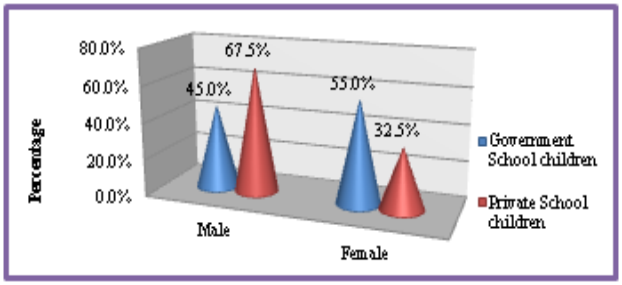

Figure 1: Conical diagram presenting % division of children according to their gender (n=200).

Allocation of school children according to their members in family as depicted in (Table 2) indicate that higher % of government school children 89 (44.5%) had three members in family and lowest 7 (3.5%) had two members in family, whereas higher % of private school children 76 (38.0%) had four members in family and lowest 7 (3.5%) had more than four members in family.

Table 2: Frequency and %division of school children according to their family members (n=200).

Members in family	Frequency	%
Two	7	3.5
Three	89	44.5
Four	55	27.5
More than four	49	24.5
Total	200	100

Prevalence of dental caries among school children

Frequency and % distribution of government school children according to dental caries, as depicted in (Figure 2) indicate that out of two hundred children, 124 (62.0%) government school children were free from caries and 76 (38.0%) children had caries teeth.

Mean and standard deviation of DMFT scores of school kids, as depicted in (Table 3) indicate that the mean DMFT scores among Government School children is 2.22±2.404 with zero minimum scores and seven

maximum score and the regular figure of carious teeth per kid in government school is 2.22 (mean dmft).

Mean and standard deviation of DMFS scores of school children, as depicted in (Table 4) indicate that the mean DMFS scores among Government school children is 5.46±7.242 with zero minimum score and twenty nine maximum score. The regular number of carious teeth per child in government school is 5.46 (mean dmfs).

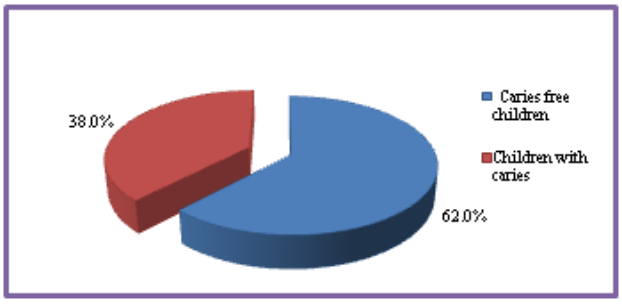

Figure 2: Pie chart showing % division of school children according to prevalence of dental caries (n=200).

Gender wise mean DMFT scores of government school children, as depicted in (Table 5) indicate that out of 200 government school children 90 (45%) were boys and 110 (55%) were girls. Gender wise evaluation of mean and standard deviation in boys 2.31±2.301 with zero minimum score and seven maximum score. DMFT mean and standard deviation in the middle of girl in habitants were 2.15±2.493 with zero minimum score and seven maximum score. The overall gender wise DMFT scores of government school children is 2.22±2.404 with zero minimum scores and seven maximum score. The regular number of carious teeth for each boy kid is 2.31 (mean dmft), the regular number of carious teeth per girl kid is 2.15 (mean dmft) and the regular number of carious teeth per child in relation to gender in government school is 2.22 (mean dmft).

Gender wise mean DMFS scores of government school children, as depicted in (Table 6) indicate that out of 200 government school children 90 (45%) were boys and 110 (55%) were girls. Gender wise evaluation of mean and standard deviation in boys 5.36±6.773 with zero minimum score and twenty-nine maximum score. DMFS mean and standard deviation among girl population were 5.54±7.633 with zero minimum scores and twenty-eight maximum score. The overall gender wise DMFS scores of government school children is 5.46±7.242 with zero minimum score and twenty-nine maximum score. The regular figure of carious teeth for each boy kid is 5.36 (mean dmfs), the regular figure of carious teeth for each girl kid is 5.54 (mean dmfs) and the regular figure of carious teeth for each kid in relation to gender in government school is 5.46 (mean dmfs). Occurrence of tooth decay according to age within govt. school kids, out of two hundred government school children as depicted in (Table 7) indicate that 35 were in 6 years, 43 were in 7 years, 46 were in 8 years, 35 were in 9 years and 41 were in 10 years.

Table 3: Mean and standard deviation of dmft scores of school children (n=200).

Primary school	N	Mean	SD	Minimum	Maximum
Government school children	200	2.22	2.404	0	7

Table 4: Mean and standard deviation of dmfs scores of school kids (n=200).

Primary school	N	Mean	SD	Minimum	Maximum
Government school children	200	5.46	7.242	0	29

Table 5: Gender wise mean dmft scores of government school children (n=200).

Gender	N	Mean	SD	Minimum	Maximum
Boys	90	2.31	2.301	0	7
Girls	110	2.15	2.493	0	7
Total	200	2.22	2.404	0	7

Table 6: Gender wise mean dmfs scores of government school children (n=200).

Gender	N	Mean	SD	Minimum	Maximum
Boys	90	5.36	6.773	0	29
Girls	110	5.54	7.633	0	28
Total	200	5.46	7.242	0	29

The highest prevalence of dental caries 48.8% (mean dmft 2.27) was seen in 10-year children, followed 45.7% (mean dmft 1.69) as seen in 6-year children, 37.0% (mean dmft 2.3) as seen in 8-year children, 31.4% (mean dmft 2.26) as seen in 9-year children and lowest prevalence of dental caries 27.9% (mean dmft 2.49) as seen in 7-year

children. The relation of age with caries prevalence among government school children is not significant. Occurrence of tooth decay according to gender in government school kids as depicted in (Figure 3) indicate that, out of two hundred school children 90 were boys and 110 were girls. The occurrence of dental caries according to gender shows females were affected more with 42.7% (mean dmft 2.15) and males were affected with 32.2% (mean dmft 2.15). The relation of gender with caries prevalence among government school children is not significant.

Table 7: Prevalence of tooth decay according to age in government school children.

Age (years)	No. of children	Caries free kids		Children with caries		DMFT	
		N	%	N	%	Mean	SD
6	35	19	54.3	16	45.7	1.69	2.06
7	43	31	72.1	12	27.9	2.49	2.46
8	46	29	63.0	17	37.0	2.3	2.30
9	35	24	68.6	11	31.4	2.26	2.39
10	41	21	51.2	20	48.8	2.27	2.74
Total	200	124	62.0	76	38	2.22	2.40

Caries prevalence $x^2 = 5.429$, $p = 0.246$ not significant

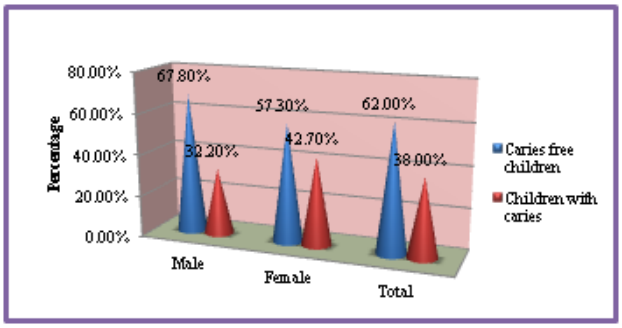

Figure 3: Conical diagram showing distribution of gender wise prevalence of dental caries among Government school children (n=200).

DISCUSSION

Out of two hundred children, 124 (62.0%) school children were free from caries and 76 (38.0%) children had caries teeth. These findings were similar to the study conducted by Aparna et al.[9] Assessment of dental caries experience among 5-16 year old school going children showed 63.5% has caries and 36.50% children were caries free children at Mangalore Karnataka. DMFT scores among Government School children is 2.22±2.404 and the regular figure of carious teeth per kid in government school is 2. DMFS scores among Government School children is 5.46±7.242, the regular number of carious teeth per child in government school is 5.46 (mean dmfs). The overall gender wise DMFT scores of school children is 2.22±2.404, the regular number of carious teeth for each boy kid is 2.31 (mean dmft), the regular number of carious teeth per girl kid is 2.15 (mean dmft) and the regular number of carious teeth per child in relation to gender in government school is 2.22(mean dmft). The gender wise DMFS scores of school children is 5.46±7.242, the regular figure of carious teeth for each boy kid is 5.36 (mean dmfs), the regular figure of carious teeth for each girl kid is 5.54 (mean dmfs) and the regular figure of carious teeth for each kid in relation to gender in government school is 5.46 (mean dmfs). This was supported by the study conducted by Airen et al.[10] Dentition status and treatment need in urban slum dwellers in Indore city, central India, which revealed that boys exhibited significantly higher caries experience as compared to girls. The highest prevalence of dental caries 48.8% (mean dmft 2.27) was seen in 10 year children, followed 45.7% (mean dmft 1.69) as seen in 6 year children, 37.0% (mean dmft 2.3) as seen in 8 year children, 31.4% (mean dmft 2.26) as seen in 9 year children and lowest prevalence of dental caries 27.9% (Mean dmft 2.49) as seen in 7 year children. The occurrence of dental caries according to gender shows females were affected more with 42.7% (mean dmft 2.15) and males were affected with 32.2% (mean dmft 2.15). These findings were similar to the study conducted by Sharma et al.[11] Oral health education and treatment on dental caries prevalence among primary schoolchildren showed that caries prevalence in females was high when compared to males.

Limitations

Limitations of current study were; the study was limited to government primary school children between the age group of 6-10 years, the study was unable to analyze the additional factors that lead to decay, such as oral cleanliness, intake of sweets, brushing regularity and dental treatment, random sampling technique was not adopted in selecting sample, as study sample were school children research scholar had difficulty in gaining their attention during data collection.

CONCLUSION

The present study concludes that there is a high dental caries experience in government school children of Kolar. The reasons for occurrence of dental caries would mainly be lack of dental awareness, motivation, illiteracy and ignorance, poor oral hygiene, improper tooth brushing techniques, and inadequate exposure to fluorides and improper dietary habits therefore; there is an urgent need

to change from restorative dental services to preventive oriented dental services for government school children to improve the oral health status.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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