

## An Epidemiological Study to Determine Dental Caries in Relation to Brushing Frequency, Oral Hygiene Aids and Dental Visits Among 5- and 12-Year-Old Children

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### ABSTRACT

**Background:** To determine dental caries prevalence among 5- and 12-year-old children in relation to brushing frequency, oral hygiene aids and dental visits.

**Materials and Methods:** A cross sectional survey was conducted to determine dental caries prevalence among 5 and 12 year old children in relation to brushing frequency, oral hygiene aids and dental visits. A total of 502 children participated in the study out of which 219 belonged to 5 year age group and 283 belonged to 12 year old children.

**Results:** Dental caries prevalence was found to be higher in children of 5 years of age (63.6%) than that of 12 years (53.6%) ( $p = 0.001$ ). The mean DMFT was  $2.47 \pm 2.75$  for 5-year-old children and  $1.18 \pm 1.33$  for 12-year-old children. The prevalence of decayed teeth was significantly more among children with no brushing (92.9%) and 2-3 times a month (100%) as compared to those who brush daily (57.9%) or twice a day (55.2%) ( $p=0.039$ ). The prevalence of decayed teeth was significantly more among children with no aid in comparison to using any aid for cleaning teeth ( $p=0.048$ ). A non-significant difference was found in the prevalence of decayed teeth among children who had never been to a dentist, who visited within last 12 months and who visited > 12 months ago. The obtained data were analyzed using the chi-square test and one-way ANOVA test.

**Conclusion:** This study thus gives a brief insight into the dental caries in relation to various factors among 5 and 12 year old children. Besides, this is an important period for instituting preventing programmes because as the teeth erupt, bacteria colonize tooth surfaces and dental behaviour starts to develop during this time. It is however important to carry out an in-depth screening survey on a larger population to draw definite conclusions about dental caries.

**Keywords:** Brushing, Children, Dental Caries, Frequency, Prevalence.

### INTRODUCTION

The preservation of healthy teeth is one of the key health issues in childhood.<sup>1</sup> Most prevalent chronic disease in man worldwide is dental caries, which is

multifactorial in nature and starts with shift in commensals of biofilm.<sup>2</sup> World Health Organization (WHO) evaluates the influence of various risk

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factors on health and pays great attention to monitoring of oral health status and its worsening because these factors can cause worse quality of life and overall health.<sup>1</sup> The world is going through an epidemiological transition. This is true more so for a developing country like India in which the infectious and the nutritional diseases are of public health concern.<sup>3</sup> High morbidity potential of dental caries has brought it into the main focus of the dental health profession. There is practically no geographic area in the world whose inhabitant does not exhibit some evidence of dental caries.<sup>4</sup> Epidemiological surveys can improve the monitoring of population-level trends of important oral health conditions, so that morbidity and treatment needs can help tailor oral health programs to meet real-life health needs. An expanding number of epidemiological studies around the world have demonstrated a direct relationship between various behavioral, social, economic and clinical factors and dental caries.<sup>5</sup>

## AIM

To determine dental caries in relation to brushing frequency, oral hygiene aids and dental visits among 5 and 12 year old children.

## MATERIALS AND METHODS

A cross sectional study was conducted to determine the relationship of dental caries with brushing frequency, oral hygiene aids and dental visits among 5 and 12 year old children.

### Sampling Method:

A randomized controlled trial was carried out with 502 children of age group 5 and 12 year.

### Inclusion Criteria:

- Children aged 5 and 12 year
- Children without physical or mental disability

### Exclusion Criteria:

- Children taking long-term medication for chronic disease
- Medically compromised children
- Children undergoing orthodontic treatment
- Children with developmental dental defects

### Examination

An informed consent was obtained from the parents of children for participation in the study. The examination was carried out in the natural sunlight and all the standard infection control protocols were strictly followed. Children were made to sit on normal plastic chair and the recordings were carried out. For the examination, plane mouth mirror and CPITN probe was used. The components of the decayed, missing, and filled teeth (DMFT) index have been defined as follows: D = tooth requiring treatment because of caries, lost or fractured filling; M = tooth missed because of caries; and F = filled tooth, no need of treatment. The World Health Organization (WHO) oral health assessment form 2013 was used to record dental caries.

## RESULTS

### Distribution of sample size according to the age

Of the total 502 children, 219 children belonged to the age group of 5 year and 283 belonged to 12-year-old children. (Table 1)

### Prevalence of Decayed Teeth in 5 and 12-year-old Children

Graph 1 shows that in the 5-year age group, decayed teeth were present in 63.6% children and in the 12-year age group, decayed teeth were present in 53.6% and this difference was statistically significant ( $p = 0.001$ ). 5-year-old children showed significantly ( $p = 0.001$ ) higher mean number of decayed (D) teeth (2.36) as compared to 12-year-old children (1.06).

### Relationship between decayed teeth and brushing frequency

Graph 2 shows the prevalence of decayed teeth between children with no brushing and 2-3 times a month, once a week, several times a week, once a day and twice or more a day.

The prevalence of decayed teeth was significantly more among children with no brushing (92.9%) and 2-3 times a month (100%) as compared to those who brush daily (57.9%) or twice a day (55.2%) ( $p=0.039$ ).

### Relationship between decayed teeth prevalence and oral hygiene aid used

Graph 3 shows that decayed teeth were present in 87.5% children who do not use any aid for cleaning teeth and 57.4% who use any other aid for cleaning teeth. The prevalence of decayed teeth was significantly more among children with no aid in comparison to using any aid for cleaning teeth ( $p=0.048$ ).

Relationship between dental visits and dental caries prevalence

Graph 4 shows that of the total 502 children, 368 had never visited a dentist, 83 had visited within last 12 months and 51 > 12 months ago.

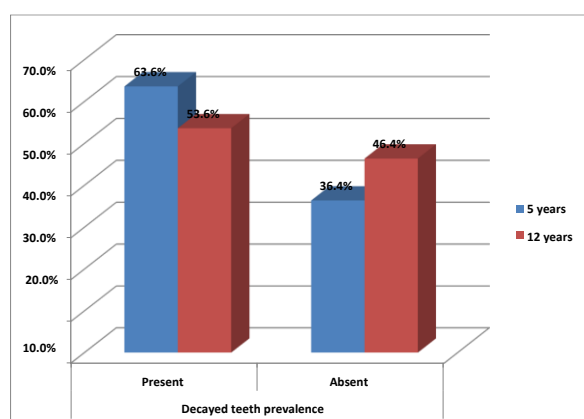
The prevalence of decayed teeth was 57.2% in children who had never been to a dentist, 58.7% in children who visited within last 12 months and 61.8% in children who visited > 12 months ago.

There was no significant difference in the prevalence of decayed teeth between children having never been to a dentist, within last 12 months and more than 12 months ago ( $p=0.675$ ).

Table 1: Distribution of sample size according to age of children.

| Age      | Number | Percentage |
|----------|--------|------------|
| 5 years  | 219    | 43.62%     |
| 12 years | 283    | 56.38%     |

Graph 1: Prevalence of decayed teeth in 5 and 12 year old children.

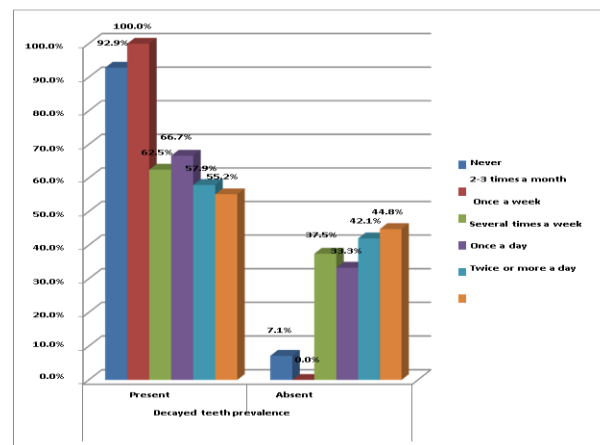


### Statistical analysis

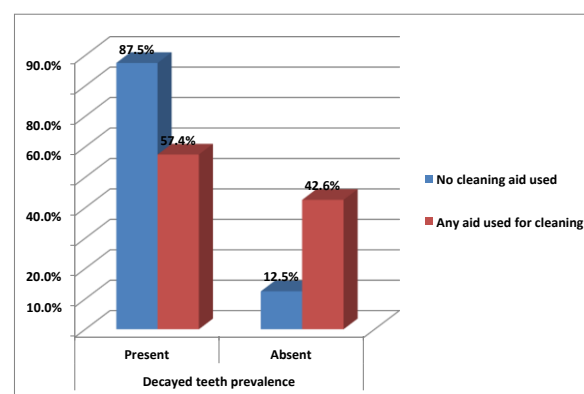
The statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0 and

Epi Info version 3.0. The Chi-square test was used as a statistical test for difference between the proportions. At a probability value of 0.05 or less, significance of all statistical tests was predetermined.

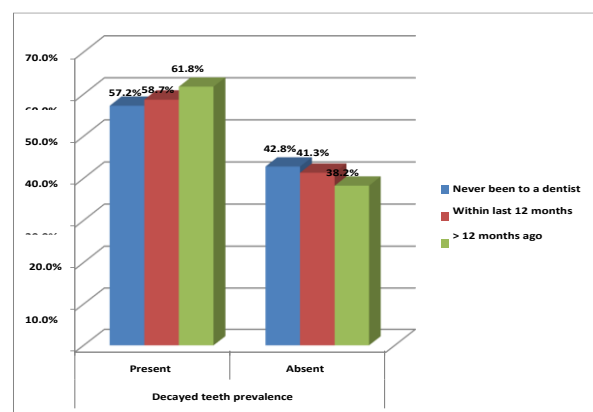
Graph 2: Relationship between decayed teeth prevalence and brushing frequency.



Graph 3: Relationship between decayed teeth prevalence and oral hygiene aid used.



Graph 4: Relationship between dental visits and decayed teeth prevalence.



## DISCUSSION

Dental caries is still a major public health problem in many developing countries where it affects 60–90% of the schoolchildren, even though it has declined in many parts of the developed countries, and the vast majority of adults as updated by WHO on the basis of epidemiological information available in the databanks.<sup>6</sup> In many developing countries, access to oral health services is limited and teeth are often left untreated or are extracted because of pain or discomfort. Throughout the world, loss of teeth is still seen by many people as a natural consequence of ageing. Control of oral disease also depends on availability and accessibility of oral health systems but reduction of risks to disease is only possible if services are oriented towards primary health care and prevention. The present study gave the correlation of prevalence of dental caries and brushing frequency, oral hygiene aids and dental visits among 5 and 12 year old children.<sup>7</sup>

In the present study, dental caries prevalence was found to be 63.6% in 5-year-old children whereas it was 53.6% in 12-year-old children. The mean number of decayed teeth, DMFT score, and DMFS score were significantly more among 5 year-old children. The results of our study were in accordance with the study conducted by Kundu H et al where dental caries prevalence was found to 48.11% among 5 year old children and 43.34% in 12 year old children.<sup>8</sup> The low caries experience was witnessed in 12 year age group when compared to 5 year age group. This can be ascribed to the fact that WHO index does not record incipient caries, but puts down only when the caries involves dentin, resulting in slight underestimation of caries in 12 year groups.<sup>9</sup>

According to our study, the prevalence of decayed teeth was significantly more ( $p=0.039$ ) among children who did not brush or brush 2-3 times a month in comparison to those who brush regularly. The results of our study are in accordance with the study conducted by Mafuvadze TB et al in Zimbabwe in 2013 where they found that prevalence of decayed teeth was more among children who do not brush their teeth daily or less often daily when compared with those who brush daily or twice a day.<sup>10</sup>

In our study, the explanation to the brushing frequency can be given as oral diseases are clearly related to behaviour, and the prevalence of dental caries has decreased with improvements in oral hygiene. Poor oral hygiene was a risk factor for developing dental caries.<sup>11</sup> Tooth brush is more effective for removal of plaque from the tooth surface. The low prevalence of dental caries in tooth brush users may be due to the fact that the bristles of a tooth brush could reach and clean those inaccessible areas of oral cavity that might not be accessible to the finger and other materials.<sup>12</sup>

In the present study, a significant association ( $p=0.048$ ) was found between decayed teeth prevalence and aid used for cleaning teeth among children. The results of our study are in accordance with the study conducted by Bhayade SS et al where caries prevalence was found to be more among more in children who were cleaning their teeth using a toothpowder and finger.<sup>13</sup> The high prevalence of dental caries in those who do not use any aid is due to the reason that they do not maintain their hygiene, as a result, more plaque accumulation, so more caries prevalence.

In the present study, no significant difference was observed among children who visited their dentist regularly and those who do not. The results of our study are in accordance with the study conducted by Kumar S et al where no significant association was found in caries prevalence among children in relation to dental visits.<sup>14</sup> The results of our study were contradictory to the study conducted by Jurgensen N et al where they found that children who had made regular dental visits experienced less dental caries than those who had never visited a dentist before and this difference was statistically significant.<sup>15</sup>

## CONCLUSION

This study thus gives a brief insight into the dental caries in relation to various factors among 5 and 12 year old children. Besides, this is an important period for instituting preventing programmes because as the teeth erupt, bacteria colonize tooth surfaces and dental behaviour starts to develop during this time. It is however important to carry out an in-depth screening survey on a larger population to draw definite conclusions about dental caries.

## CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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