

Prevalence of Dental Caries among 5 & 12 Years Old Children - A Retrospective Data Analysis

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Abstract

Background: Dental caries is an important social problem in India and is predominantly a disease of childhood. While there has been a great decline of caries incidence in high-income countries, the middle- and low-income countries suffer a high rate of incidence. It is due to the increasing consumption of refined carbohydrates, poor oral hygiene, and lack of dental awareness. This study aimed at the prevalence of dental caries among 5- and 12-year-old children in Tirukalukundram Taluk. **Materials and Methods:** A retrospective data analysis was performed with the data collected from the government school students in Tirukalukundram Taluk in 2018–2019. Registers containing data were screened for dental caries. **Results:** Among 515 study participants, 291 were male and 224 were female. The prevalence of dental caries is high among male compared to female children. **Conclusion:** The prevalence of dental caries is high in 5-year-old children than 12-year-old children. The filled component is nil in 5-year-old children. This clearly illustrates the utilization pattern of dental care services by the children. Hence, efforts should be taken to educate the rural people and government schoolchildren on oral hygiene and its maintenance.

Keywords: Children, dental caries, India

INTRODUCTION

Oral health is integral to general health and well-being. The public health problems associated with oral diseases are a serious burden on countries around the world.^[1] The World Health Organization (WHO) has ranked dental caries as number “three” among all chronic, noncommunicable diseases.^[2]

Dental caries is an important social problem in India and is predominantly a disease of childhood.^[3] While there has been a great decline of caries incidence in high-income countries, middle- and low-income countries suffer a high rate of incidence. It is due to the increasing consumption of refined carbohydrates, poor oral hygiene, lack of dental awareness, minimal availability of dental services, lack of mother’s schooling, and low socioeconomic status.^[4,5]

The age of 5 and 12 is the most indispensable because at the age of 5 years, the child enters the school^[6] Children with good oral health have a pleasant smile it gives psychological strength in their secondary socialization. Children in the age

group of around 5 years is of interest in relation to caries levels in primary dentition, which may exhibit over a shorter time span than in permanent dentition at other index ages. At 12 years, children leave the primary school.^[6] Moreover, all the permanent teeth would have been erupted. Thus, the age of 12 is considered the age of global monitoring of caries, for monitoring of disease trends.^[7]

Majority of the rural areas located in Tamil Nadu comprise people of middle- and lower socioeconomic status. Hence, a study was carried out among the WHO index age group (5 and 12 years) children, studying in government schools of Tirukalukundram Taluk.

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MATERIALS AND METHODS

A retrospective data analysis was performed with the data collected from the government school students in Tirukalukundram Taluk in 2018–2019. Prior to the commencement of the study, ethical approval for the study has been obtained from the Institutional Scientific Recruitment Board, Asan Memorial Dental College and Hospital. The sample size for the current study is 247 5-year-old children and 268 12-year-old children. This estimation was based on the prevalence of dental caries among rural children in the study conducted by Janakiram *et al.*^[8] Inclusion criterion for the study was students studying in government school belonging to 5–12 years of age in Tirukalukundram Taluk. Students studying in convent schools and Central Board of Secondary Education (CBSE) schools and also students of other ages studying in government schools in Tirukalukundram Taluk were excluded from the study. Screening camps have been conducted in the government schools of Tirukalukundram Taluk, Tamil Nadu, in the school academic year of 2018–2019. Camp registers containing the data of 5- and 12-year-old children have been analyzed for the study. Using the criteria given by the WHO for assessing the dental caries, decayed, missing and filled teeth (DMFT) was assessed from the primary data in the registers. Statistical analysis was performed using SPSS (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp) software version 23. Independent samples *t*-test was used to compare across gender among the study population.

RESULTS

The present retrospective study was conducted to assess the prevalence of dental caries among 5- and 12-year-old children; Figure 1 depicts the distribution of study participants according to gender. Among the 12-year-old children, 166 (61.9%) were male and 102 (39.1%) were female and among the 5-year-old children, 125 (50.6%) were male and 122 (49.4%) were female.

Table 1 depicts the prevalence of dental caries among the 12-year-old children across gender; the mean DMFT score was 2.07 ± 1.06 , the mean DT score was 1.93 ± 0.96 , the mean MT score was 0.09 ± 0.37 , and the mean FT score was 0.05 ± 0.24 . There was no significant difference in the DMFT score across gender, however the mean DT score was high

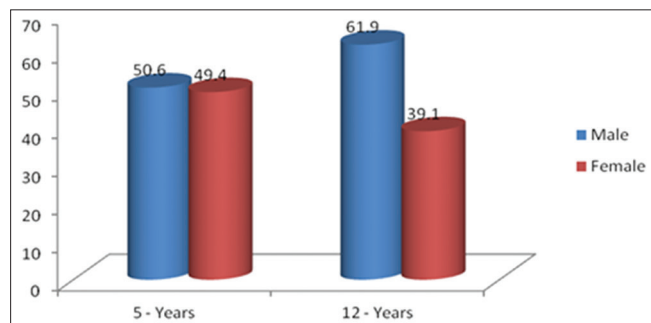


Figure 1: Distribution of study participants according to gender

among the male and FT score was high among the female study participants.

Table 2 depicts the prevalence of dental caries among 5-year-old children across gender; the mean DMFT score was 2.72 ± 1.85 , the mean DT score was 2.63 ± 1.86 , the mean MT score was 0.09 ± 0.31 , and the mean FT score was 0 among the study population. The mean DMFT score, DT score, and MT score were high among females compared to males; the difference in score was not statistically significant.

Table 3 depicts the prevalence of caries-free children; among the 5-year-old children, 176 (71.3%) had dental caries and 71 (28.7%) were caries free, whereas among 12-year-old children, 171 (61.8%) suffered from dental caries and 97 (36.2%) were caries free.

DISCUSSION

Many studies have been conducted to identify the prevalence of dental caries in different parts of India.^[4] For global monitoring purposes, the WHO recommends the use of certain index age groups to summarize the burden of dental caries and other oral diseases.^[8] Studies to assess the prevalence rate of caries in a rural region like Tirukalukundram are nil. Hence, this study has been conducted.

In the present study, the prevalence of dental caries was higher in 12-year-old male children ($n = 166$) (61.9%)

Table 1: Distribution of 12-year-old children according to the prevalence of dental caries and gender

| DMFT | Male* | Female* | <i>t</i> | df | <i>P</i> * |
|------|-----------|-----------|----------|-----|------------|
| DT | 1.94±0.95 | 1.9±0.99 | 0.31 | 266 | 0.64 |
| MT | 0.1±0.35 | 0.08±0.38 | 0.514 | | 0.35 |
| FT | 0.04±0.20 | 0.07±0.23 | 0.87 | | 0.07 |
| DMFT | 2.08±1.05 | 2.05±1.07 | 0.264 | | 0.82 |

*Independent *t*-test, ($P > 0.05$ – not significant). DMFT: Decayed, missing, and filled teeth

Table 2: Distribution of 5-year-old children according to the prevalence of dental caries and gender

| DMFT | Male* | Female* | <i>t</i> | df | <i>P</i> * |
|------|-----------|-----------|----------|-----|------------|
| DT | 2.54±1.79 | 2.71±1.93 | 0.71 | 245 | 0.37 |
| MT | 0.07±0.28 | 0.11±0.33 | 0.09 | | 0.83 |
| FT | 0 | 0 | 0 | | 0 |
| DMFT | 2.62±1.79 | 2.82±1.91 | 0.72 | | 0.39 |

*Independent *t*-test, ($P > 0.05$ – not significant). DMFT: Decayed, missing, and filled teeth

Table 3: Distribution of study participants according to the presence or absence of dental caries

| Age | Caries free*, <i>n</i> (%) | Caries present*, <i>n</i> (%) | Total | χ^2 | <i>P</i> |
|----------|----------------------------|-------------------------------|-----------|----------|----------|
| 5 years | 71 (28.7) | 176 (71.3) | 247 (100) | 2.915 | 0.087 |
| 12 years | 97 (36.2) | 171 (61.8) | 268 (100) | | |

*Chi-square test, ($P > 0.05$ – not significant)

when compared to female children of the same age group ($n = 102$) (39.1%). This could be because of their eruption pattern, occlusion, dental attendance, high sugar diet, and lack of awareness among parents. Among the 5 year old children, the prevalence of dental caries is equal across genders, male ($n = 122$, 49.4%) and female ($n = 125$, 50.6%). It is due to the lower calcium content of deciduous teeth and structural differences that may increase caries susceptibility.^[9] The prevalence of dental caries is lower in deciduous dentition than the permanent dentition. This could be attributed to the fact that change from primary to permanent dentition has a higher susceptibility to caries. The increased prevalence of caries in males of 12 years might be due to the marked preference for sons, which manifests in preferential feeding compared to daughters and the snacking habit of boys during the school breaks.^[10]

Among 5-year-old children, the mean DMFT in the study was 2.62 in males and 2.82 in females, whereas in a previous study conducted by Janakiram *et al.*, it was 2.05 in males and 1.95 in females. In 12-year-old children, DMFT in the present study was 2.08 in males and 2.05 in females, which is comparatively a high score in relation to the DMFT of 1.16 in males and 1.18 in females in the study conducted by Janakiram *et al.*^[8] The prevalence of dental caries in the present study was marginally high among children attributed to their diet pattern, snacking habits and their socio economic status.^[11,12]

Filled component in the present study was 0.07 in 12-year-old children and 0 in 5-year-old children. This is because the students in the present study are from rural region and from government schools. The filled tooth component in a previous study which was conducted in CBSE and convent schools was 1.08 in 12-year-old children and 0.87 in 5-year-old children. Availability, lack of awareness, and accessibility of dental care services are limited to the study participants in the current study; this attributes to the absence of dental treatment among children.

Caries-free students in the present study among the age group of 5 years constituted 28.7%. This is a poor result in relation to the study conducted by Reddy *et al.*, where it was 45.8%. This could be because of lack of mother's knowledge in child's oral hygiene care and maintenance. Among 12-year-old children, those who were caries free in the present study constituted 36.2%, which is comparatively very less in relation to the previous study conducted by Reddy *et al.*, where it was 70.7%.^[13] The reason behind this is the inability to afford for treatment by parents and negligence to treatment by the children.

CONCLUSION

There is a high prevalence of dental caries among 5-year-old children than 12-year-old children. The filled component is virtually nil in 5-year-old children. This clearly reveals that the parents of children from rural areas do not utilize the dental services regularly for their children. This is due to the lack of awareness regarding the importance of dental care to the children. Hence, efforts should be taken to educate the parents of government schoolchildren regarding the availability, accessibility, and proper utilization of dental care services.

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Conflicts of interest

There are no conflicts of interest.

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