

Original Research Article

Correlation of decayed, missing and filled teeth with risk factors for dental caries in children attending outpatient department in tertiary care hospital

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ABSTRACT

Background: Oral health is of vital importance to humans' general health. Despite the marked improvement in oral health, caries occurs in both developed and developing countries worldwide. The patient's age is important for determining caries risk. Special attention must be paid to children's oral health when deciduous teeth start erupting and occlusion has formed in 2 to 3-year-old children. To assess the correlation of decayed, missing and filled teeth (dmft/DMFT) with risk factors for dental caries in children and with knowledge, attitude, and practices of parents regarding dental caries.

Methods: Cross-sectional study included 96 children with dental caries attending paediatric outpatient department of Government Stanley Medical College, Chennai, Tamil Nadu, India between 2018 March to November. Clinical evaluation, dmft score, and knowledge, attitude and practices of parents were assessed using pre-formed questionnaire.

Results: Patients with high dmft score were found to have low practice score with the Pearson correlation coefficient(r) value -0.41 and P value was 0.01. Corresponding values of knowledge and attitude were not statistically significant. Children who nap/sleep with bottle/pacifier have increased risk (P value-0.01).

Conclusions: An oral health risk assessment should be done periodically by Paediatrician who has regular contact with children for early identification of dental caries, to impart healthy oral practices and make them aware of preventive measures.

Keywords: Caries intensity index, DT-carious teeth, Missed teeth, International association of dental research DMFT

INTRODUCTION

Caries is one of the most widespread chronic illnesses among people worldwide, and individuals are susceptible to this disease throughout their lives. As an early display, caries affects children aged up to 71 months.¹ In studies conducted in industrialized and unindustrialized countries, caries afflicts from 28% to 82% of children.

According to sources, 25% of children have damaged teeth and 80% of the parents whose 2 to 5-year-old children's teeth were damaged had low income.² The prevalence of caries among children is high and tends to increase in populations that consume cariogenic foods. An individual's health is influenced by biological, social, economic and environmental factors and factors related to lifestyle habits.³ These factors affect the health of a

whole society and therefore sustainable society development. To create preconditions for lifelong good health, preventive actions must be popularized and developed. Caries risk factors need to be viewed as a whole because each factor separately possesses a less potent ability to influence caries development.⁴ Caries development is determined by the balance between pathological and protective factors or between demineralization and remineralization processes. Despite improvements in the oral health of populations globally, problems still remain in many communities around the world particularly among underprivileged groups in developed and developing countries.⁵ Poor oral health has a profound effect on general health and several oral diseases are related to chronic diseases. The experience of pain, problems with eating, chewing, smiling and communication due to missing, discolored and damaged teeth have a major impact on people's daily lives and wellbeing.⁶ Dental caries and periodontal diseases have historically been considered the most important global oral health burdens. In most developing countries, the level of dental caries was low until recent years, but the prevalence rate of dental caries is now showing a steady increase. This is largely due to increasing consumption of sugar and inadequate exposure to fluorides.⁷

METHODS

The cross-sectional study included 96 children with dental caries attending Pediatric outpatient department of Government Stanley Medical College, Chennai, Tamil Nadu, India between 2018 March to November. Clinical evaluation, dmft score, and knowledge, attitude and practices of parents were assessed using pre-formed questionnaire. The examinations of the children's oral cavities were conducted in conditions as similar as possible among the preschool premises in the rooms of the corresponding children's age group. The study author performed the examinations alone. In the examinations, an optical fiber lamp (ROR Int ApS), dentistry mirrors and blunt probes were used. The acquired data (cariou, filled, missed teeth, plaque and gum health) were recorded on the clinical examination cards. Caries prevalence was expressed as a percentage (%): the proportion of persons with decayed teeth among the total number of examined persons, multiplied by 100. The caries frequency in children with deciduous occlusion (dmft) shows the caries experience of one person or a group of children. The caries decay (dmft) in children for one person is the sum of carious, missing and filled teeth. The mean value of dmft is the sum of the children group divided by the number of examined children. To evaluate 12 oral hygiene, a blunt probe was utilized. The acquired results were recorded as follows: 2 - no plaque; 1-plaque can be seen by scraping the surface of the tooth with the probe; 0- no plaque can be seen on the tooth surface with the naked eye. To assess the degree of gingivitis, the Gingival index (modified from Loe and Silness 1963) was used, where: 0-no pathology; 1-inflammation in the initial stage; 2-bleeding when touched with the probe; and

3-spontaneous bleeding. In children and their mothers, Streptococcus mutans and Lactobacillus counts in saliva were determined using chairside test CRT bacteria (Ivoclar Vivadent, Liechtenstein). Saliva was collected with a dropper separately from the oral cavity of the child and his/her mother. Saliva was spread onto the culture media of the chair side test, and the CRTs were inserted in the incubator for 48 hours at 37°C. Afterwards, the scores of the streptococcus mutans and lactobacillus were evaluated semi-quantitatively by comparing the density of the colonies on the culture medium with the CRT bacteria map. Saliva stimulation was not used. Saliva inoculation and analysis were performed by the author of the study, who had previously acquired the methodology on microbiologic culture mediums. dmft/ DMFT score: 1. dmft-decayed + missing + filled teeth. 2. Indicates the prevalence of dental caries. 3. Temporary teeth-dmft, max score-20, min-0.4. Permanent teeth-DMFT, max score-32, min score-0. 5. Eg, dmft -4+1+2= 8 indicates 4 decayed, 1 missing and 2 filled teeth.

Statistical analysis

To compare two dependent and independent groups by one feature, a suitable student t-test was used; however, to compare several independent groups by one feature, dispersion analysis (ANOVA) was applied. To analyze the additional factors (covariants), covariant analysis (ANCOVA) was used. In cases where the data to be analyzed did not correspond with the normal distribution, a suitable non-parametric test (Mann-Whitney test) was used. The result was assessed as significantly varied if the zero-hypothesis probability was 0.05 or lower, i.e. if the criterion for rejecting the zero hypotheses was a level of significance of p=0.05. Otherwise, the zero hypotheses were accepted. To analyze the connection of two features, Pearson correlation analysis was used. Data statistical processing was carried out by applying IBM SPSS version 17.

RESULTS

Table 1 shows Three hundred thirty children aged 2 to 3 years and their mothers took part in the study. Of the examined children, 35 (33%) were girls, and 65 (63%) were boys. The average age of the group was 31.5 (SD 3.8) months.

Table 1: Gender distribution.

Sex	Percent (n)
Male	65% (63)
Female	35% (33)
Total	100(96)

Table 2 shows according to the non-parametric Mann-Whitney (Mann-Whitney) test analysis, it was concluded that there was a significant distinction between caries and the child's gender (p<0.001). In this age group, caries was observed more frequently in boys than in girls. To

acquire more precise information, the study group was divided into two sub-groups: children with caries and children without caries. According to the Spearman correlation coefficient analysis, it was ascertained that in the group with caries, there was no significant correlation between age and caries (p=0.71).

Table 2: Age distribution.

Age	Percent (n)
2-5 years	28% (27)
6-10 years	72% (69)
Total	100% (96)

Table 3 shows in 100 children side ward method of brushing was constantly followed by 97 children and upward and downward method of brushing was in 3 children which is found to be less significant. All the children reported that they are cleaning their teeth with a brush and paste twice daily. However, before joining to orphanage only 72.1% of children were using a brush and paste for cleaning their teeth.

Table 3: Brushing methods.

Brushing method	Percent
Sideward	97
Upwards and downwards	3
Total	100

Table 4 shows by analyzing the obtained data and surveying the mothers, it was concluded that the majority of children (96%) had three or more main meals. The data analysis indicates that two or more main meals contain sugar for 41% of 2-to 3-year-old children, and 47% of children consumed a sugary drink daily. Additional eating between the main meals was marked for all children; the majority of children (58%) had two additional meals.

Table 4: Frequency of snacks intake.

Frequency of chocolate/sweet/snack intake	Percent
Thrice/week	6
1-2/day	19
3-5/day	40
6-8/day	15
9-10/day	19
Total	100

Table 5 shows out of all of the 2- to 3-year-olds, 28% had a plaque on their examined teeth surfaces. For the rest of the children (50%), a plaque was not observed on the evaluated teeth surfaces. There was a significant correlation between existent caries and plaque (p<0.001). Gingivitis influenced caries existence for 21 children; there was a significant correlation between caries existence and gingivitis (p <0.001).

Table 5: Caries of temporary affect permanent teeth.

Caries of temporary affect permanent teeth	Percent
Don't know	28
No	50
Yes	22
Total	100

Table 6 shows the difference in mean DMFT score between the lower middle (13) and upper lower (87) socioeconomic strata is statistically significant, p-value - 0.047. Socioeconomic status (Modified kuppuswamy's scale -2007).

Table 6: Socioeconomic status.

Socioeconomic status	Percent
Lower middle III	13
Upper lower IV	87
TOTAL	100

Figure 7 shows correlation of dmft score with-practice score: statistically significant (p value-0.018) knowledge score: statistically not significant (p value-0.475), attitude score: statistically not significant (p value-0.495). Pearson correlation for dmft with- knowledge:0.131, attitude: -0.125 and practice: - 0.416. indicates positive correlation with knowledge and negative correlation with practice.

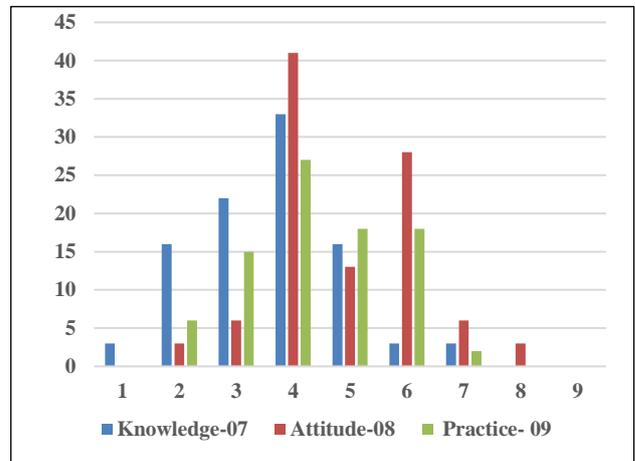


Figure 1: Knowledge, attitude and practice score.

DISCUSSION

Present study found that 56% of the children had a plaque on the vestibular surfaces of the upper jaw frontal teeth. Gingivitis was found in 6.4% of children, which is explained by the fact that parents do not pay enough attention to deciduous teeth cleaning. Of the children, 31% brushed their teeth irregularly, and 34% brushed their teeth twice a day; 47% of parents helped their children with teeth brushing.⁸ The age of the studied

children was 2 to 3 years, and children this age are not capable of cleaning their teeth effectively; therefore, parents should pay more attention to the oral hygiene of their children.⁹ Based on the data collected by Klein et al starting teeth 33 cleaning early and cleaning teeth frequently reduces caries risk.¹⁰ Sarma KV et al, noted that for children younger than 2 years, teeth brushing twice a day considerably decreases caries.¹¹ Clinical trials have shown that in children ages 3-6 cleaning teeth twice a day with fluoridated toothpaste decreases the prevalence of caries Pitts NB et al A study Siddiqui NJ et al, conducted on 3-year-olds in Lithuania found a positive correlation between teeth brushing and early childhood caries.^{12,13} It is important for prophylaxis for caries prevention start in the prenatal period Petersen PE et al The use of xylitol in pregnant women and new mothers have been studied for 30 years, and it has been shown to decrease the number of bacteria in saliva.¹⁴ It has been shown that among young children whose mothers used xylitol chewing gum, the prevalence of caries was lower than it was in the control group RF Majewski RF et al, Data on the use of xylitol are not included in present study.¹⁵ Nutrition plays an important role in human life. Food quality affects human health in general and an individual's dental health. Food and eating habits play a significant role in caries development. In present study, 41% of children had two or more main meals containing sugar per day, and 47% of children drank sugar-based drinks at least once a day.¹⁶ The sugar-containing food was mostly chocolate, candy, biscuits, and curd cheese dessert, and the drinks were sweetened lemonades, juice and sweet tea. Most frequently, sweets were given by the parents (46%), followed by acquaintances, friends, brothers, and sisters (36%) and then grandparents (17%).¹⁷ Obviously, family members do not consider deciduous teeth to be important because they will eventually fall out anyway, and because of the everyday occupancy, oral hygiene becomes secondary.¹⁸ Currently, social and economic values considerably affect oral health. Retrospective studies have shown that there is a difference between parents' attitude towards oral hygiene control and the correlation between social factors and the family.¹⁹ According to the study data, a relatively large number of mothers did not know about the importance of preserving deciduous teeth, but most of them believed that deciduous teeth should be treated.²⁰

CONCLUSION

This study showed a statistically significant association between dental caries and BMI for the selected age in this study sample. Although it is not acceptable to have obesity among schoolchildren, the study showed that they have healthier teeth than others did. Fluoride toothpaste usage and socioeconomic score were associated significantly with dental caries. Teeth brushing frequency, parent's education, and physical activity were not statistically significant with dental caries.

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