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Original Research Article

Early childhood caries and oral hygiene practices among preschool children in Mangaluru city

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ABSTRACT

Background: Dental caries in young children is a serious public health problem that is highly underestimated in a country like India as it is not life threatening. The rapid westernization and urbanization in Mangaluru city has led to the inclusion of more refined sugars, frequent snacking habit and intake of more chocolates and candies in children, making them more susceptible to early childhood caries (ECC). This study intends to determine prevalence of ECC.
Methods: This cross-sectional study was conducted among 240 preschool children aged 3-6 years studying in private preschools in the North Zone of Mangaluru city, Karnataka, India. Data collection was done using semi-structured and self-administered questionnaire given to the parent; examination of the child's oral cavity was also done.
Results: The prevalence of ECC in preschool children in Mangaluru City was 57.5%. A statistically significant association was seen between oral hygiene practices and father's education level (p=0.033). The oral hygiene practices were found to be satisfactory with the majority (62.1%) of them following good oral hygiene practices.
Conclusions: Lack of awareness about ECC has further contributed to the increase in the prevalence and severity of the problem hence revealing the need for effective preventive methods.

Keywords: ECC, Preschool children, India

INTRODUCTION

Dental caries in young children has a unique pattern and poses entirely new challenges.[1] Early childhood caries (ECC) is defined as the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in any primary tooth in a preschool-age child between birth and 71 months of age.[2]

Internationally, the prevalence of ECC has been reported to range from 6-90%, with most developed countries in the lower end, and most developing countries, in the middle to the higher end of this range.[3] Untreated ECC can lead to harsh consequences such as abscesses, pain, malocclusions and lasting psychosocial impediments.[4] The amount of decay seen is so deleterious that there is a need for deep sedation and general anesthesia as children are unlikely to sit for extensive treatments.[5]

This study aims to determine the prevalence of ECC and the oral hygiene practices among preschool children in Mangaluru City. The objective of this study is to determine the association between oral hygiene practices and ECC and to determine the association between socio-demographic factors and oral hygiene practices.

This study will result in improving the awareness about ECC among parents of preschool children and might also

provide an insight into the treatment measures and the severity of the problem in preschool children.

Early intervention helps in providing an opportunity to educate parents in many areas such as good oral hygiene, the form of proper tooth brushing, prevention of dental injuries, prevention of nursing caries, reinforcing the importance of dental visits at regular intervals, and proper dietary practices.[5] In the longer run, the study will improve oral health-related quality of life in young preschool children in India.

METHODS

This cross-sectional study was conducted in private preschools in the North Zone of Mangaluru city, Karnataka, India. The study population was preschool students studying in private preschools aged 3-6 years. A two-stage sampling technique has been used for this study and the sample size was obtained as 237, thus rounding it off to 240; the prevalence of ECC was taken as 19.2%, 5% precision and 95% confidence interval was taken. The study was conducted from January 2019 to April 2019. The study was piloted among 10 preschool children post which minor changes were made in the questionnaire. This school was excluded from the final data collection.

Data collection and clinical examination

Data collection from the selected preschools was done during January and February 2019. For the collection of data, semi-structured and self-administered questionnaire, filled by the parent was used for collecting all the relevant and required information. The questionnaire developed in the English language was translated to Kannada (local language). Examination of the oral cavity was done and the dentition status was recorded according to WHO (World Health Organization) oral health assessment form for children 2013 using mouth mirror and CPI (Community Periodontal Index) probe along with the calculation of the deft (decayed, extracted, filled teeth) score.

Inclusion criteria

Preschool children whose parents had given consent for participation in the study and for dental examination of their child/children.

Exclusion criteria

Exclusion criteria includes children who are absent on the day of data collection, children with enamel hypoplasia and who did not co-operate during the dental examination.

Data analysis

Quantitative variables have been documented by percentages and also presented as mean and standard deviation. Association of categorical variables has been tested by using chi-square test and likelihood ratio. P value <0.05 was used as statistically significant. SPSS (Statistical Package for Social sciences) version 16 was used to analyze the data.

RESULTS

Out of 240 preschool children, most of them (50.8%) belonged to the age group of 60-71 months and the least (20.4%) belonged to the age group of 36-47 months. The minimum age was 36 months and the maximum was 71 months, with the mean age of 57.2±9.4 months. More than half of the preschool children were females (54.6%).

All the children (240) had their teeth cleaned daily using a toothbrush. More than half of the children (52.1%) were supervised by their parents while brushing teeth while most of them brushed once a day (50.4 %) and the maximum number of children (231) brushed their teeth in the morning before breakfast. Nearly all the children used toothpaste (98.3%) while most of the respondents (58.5%) did not know whether the tooth paste was fluoridated or not.

Table 1: Distribution of participants according to the strokes used while brushing, duration of brushing teeth and the change of toothbrush.

Variables	Frequency	%
Strokes used (n=240)		
Horizontal only	59	24.6
Vertical only	14	5.8
Both horizontal and vertical	78	32.5
Circular	23	9.6
All	66	27.5
Time interval (n=186)		
1-2 min	46	24.7
2-3 min	50	26.9
3-4 min	31	16.7
4-5 min	3	1.6
≥5 min	56	30.1

Continued.

Variables	Frequency	%
Change of toothbrush (n=240)		
Once in 3 months	119	49.6
3-6 months	92	38.3
>6months-1year	8	3.3
As soon as it gets frayed	21	8.8

Table 2: Distribution of participants according to the frequency of snacks consumed by the child and the deft score.

Variables	Frequency	%
Frequency of snacks consumed by the child (n=240)		
Once	80	33.3
Twice	89	37.1
Thrice	55	22.9
None	16	6.7
Deft score (n=240)		
0	102	42.5
1-3	70	29.2
4-6	39	16.2
≥7	29	12.1

Table 3: Bivariate analysis of socio-demographic factors (age, sex and father's education) and oral hygiene practices.

Variables	Poor Practice	Good Practice	P value
	N (%)	N (%)	
Age groups (months)			
36-47	23 (47)	26 (53)	
48-59	20 (29)	49 (71)	0.126
60-71	48 (39)	74 (61)	
Sex			
Male	46 (42)	63 (58)	0.212
Female	45 (34)	86 (66)	
Father's education			
School certificate	43 (32)	91 (68)	0.033
Graduate and diploma	42 (46)	49 (54)	
Profession/honours	4 (31)	9 (69)	

Around one third of the children (32.5%) reportedly used both horizontal and vertical strokes for brushing teeth and around 26.9% reported that their child brushed for 2-3 minutes (Table 1). Nearly half of the respondents (49.6%) changed the child's toothbrush once in three months (Table 1). The majority (61.2%) of the respondents reported of tongue cleaning being practiced by the child with the back of the brush (55.1%) being the most frequently used aid for tongue cleaning. Majority of the children (85%) practiced mouth rinsing.

Snacks were consumed twice daily by around 37.1% of the children (Table 2). Biscuit was the most commonly consumed snack. Maximum number of children (177) reportedly consumed biscuits. More than half of the children (55.8%) did not consume sweetened milk/juice/soft drinks at night.

Majority of parents (70%) had never taken their child to the dentist. Of the total 72 children (30%) who had visited the dentist, most of them (58.3%) had visited the dentist only in case of dental problem (Figure 1).

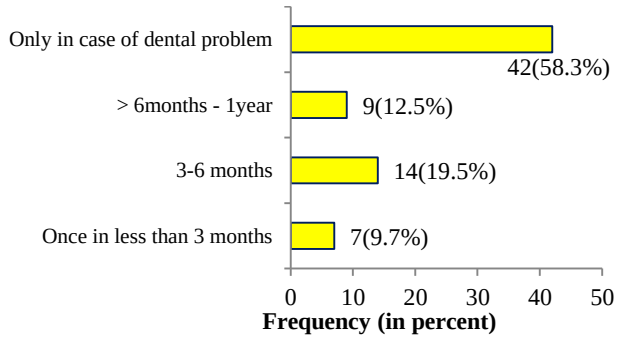

Figure 1: Distribution of participants according to the frequency of dental visits (n=72).

Majority of the participants, 62.1% (149) had good oral hygiene practices. The median deft (decayed, extracted, filled teeth) score was found to be 1. The minimum score obtained was 0 and the maximum score obtained was 16 (Table 2). There was no significant association between age and gender of the child (Table 3), family size, monthly income and family type; mother's education and occupation; and father's occupation with oral hygiene practices. A statistically significant association was seen between oral hygiene practices and father's education level (p=0.033) (Table 3). No significant association was found between ECC and oral hygiene practices.

DISCUSSION

The prevalence of ECC was found to be 57.5% in this study. In a systematic literature search, in South Africa and Swaziland, the prevalence of ECC in 5-6 year old children was comparable (57%).[6] The key factors driving the epidemic of tooth decay are the increasing consumption of sugary foods and drinks and the inadequate use of fluoridated toothpaste, water, salt and milk, to prevent tooth decay; inadequate economic resources to meet the need for dental treatment and also the lack of dentists that might be the reason for the escalating prevalence of ECC in developing countries. [7]

In this study, most of the children (50.8%) were 5 years (60-71 months) old and most of them were females (54.6%). A comparable categorization was evident in the study conducted in Riyadh in the year 2017 in which most of the children (78.3%) were 5years old and females comprised of 51.8% of the total sample. [8] It has been reported that parents with higher education have a more positive attitude and intention to control their children's health behavior than low-educated parents.[5] In the present study, a statistically significant association is seen between oral hygiene practices and father's education level (p=0.033).

The toothbrush was reportedly changed once in 3 months by most of them (49.6%). Majority of the children (61.2%) practiced tongue cleaning. The results are comparable with the study conducted in Mumbai in the year 2011 where the majority of the parents (82.8%) made their child practice tongue cleaning and nearly half of them (53.8%) changed the child's brush once in 3 months.[5] The good oral hygiene practices, with the majority following mouth rinsing, correct time of changing the toothbrush and tongue cleaning reflects desirable parental dental knowledge and education.

Dietary habits have shifted in all age groups in the Western populations in recent decades, including a nearly doubled intake of energy-dense, low-nutrient dense snack foods. Nearly all children (97%) ate snacks most days, and 60% ate 1–2 sweet snack items most days as per a study conducted among preschool children in Boston in 2010.[9] Similar results were found in this study where the majority (93.3%) consumed snacks on a daily basis with most of them consuming snacks twice a day (37.1%) followed by 33.3% consuming them once a day.

Dental visits should be carried out in a timely manner for screening and monitoring caries at early stage to stop caries progression. [8] In this study, majority of the children (70%) had never visited the dentist and of those who had visited the dentist, most of them (58.3%) had visited only in case of dental problem. The findings are similar to a study in Philippines where only 32% had a dental visit, mostly for emergency reasons (45%).[10] The possible reason for majority of the children not having visited the dentist in the present study may be due to negligence as tooth decay is not life-threatening.

CONCLUSION

The prevalence of ECC in preschool children in Mangaluru city reveals the need for effective preventive methods. These preventive methods need to be essentially community based which include school health awareness programmes and health education initiatives aimed to improve oral hygiene practices and have the potential to increase community knowledge of ECC so that long term behavioral change can be sustained among parents as child's early oral hygiene practices are mostly controlled by the parents. Pediatricians and dentists need to play a more effective role in the prevention of ECC.

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