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Original Research

Socio-behavioural influence on caries prevalence among school children in Ludhiana City, Punjab

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ABSTRACT:

Aims: The aim of the study was to assess the prevalence of dental caries and their association with demographic factors and oral hygiene practices among school children in Ludhiana City. **Methods and Materials**: A total of 1200 children, between the ages of 3-12 years were selected from children who came to Christian Dental college, Ludhiana. A consent form informing the necessity and purpose of the study and a questionnaire including questions regarding demographic details and oral hygiene practices were given to the parents/ guardians of every child. Clinical examination was done in Dept. Of Pedodontics by a single qualified examiner. **Results**: The overall prevalence of dental caries in 3-12 years' age group in Ludhiana City was 80.1%. 69.8% of caries prevalence was found in primary dentition and 83.0% of caries prevalence was found in mixed dentition. Age was the only factor found to be statistically significant with caries prevalence in the present study. Similar prevalence for caries was found in both genders and in relation with type of school while higher caries prevalence was found in low socio economic group and single child. Factors like cleaning frequency and cleaning aids did not show any statistically significant association with caries prevalence while higher caries prevalence was seen in children who were not assisted while brushing. **Conclusion:** Results reveals that there is a need of immediate educative and preventive programs in the population so as to improve the dental health in the city of Ludhiana, Punjab.

Key-words: prevalence, dental caries, children

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INTRODUCTION

For a child's development, overall health and wellbeing, it is important to have a good oral health even at young age. Epidemiological studies have revealed that dental caries is the most prevalent chronic disease worldwide in the paediatric community and represent a costly burden to healthcare services. Evidences are available inorder to prove that dental caries at young age is responsible for decay in the older ages too.

Dental caries is the most common chronic disease of childhood that hinders with regular diet consumption, speech, confidence and daily routine activities. It is a multifactorial disease, with many factors of risk contributing to their initiation and progression and these can be categorized as biological, environmental or socio behavioural factors. It is a biofilm mediated, diet modulated, multifactorial, non-communicable, dynamic disease resulting in net mineral loss of dental hard tissues. The acid-producing bacteria and fermentable carbohydrates, and many host factorsforms a complex inter relationship which results in the formation of dental caries.It can affect the primary dentition and arise in young age in the form of an aggressive tooth decay.[1]

A period from child to adolescence can be considered as school going years.[2] Even though dental caries affects all age groups, the group being in highest risk is the school going children. These are the most influential period of a human's life wherein, substantial oral health behaviours, beliefs and attitudes are established. A WHO reportshows that 60–90% of school children worldwide have experienced dental caries.[3,4] In India one out of every two children is affected by dental caries and there is an increase in caries rate in deciduous dentition.

In spite of numerous scientific advances, dental caries continues to be a major health problem in

India, even though these are preventable. Lack of proper community based preventive programs and oral health measures are exacerbating the current scenario in India. The assessment of various factors affecting dental caries will help to understand the aetiology more clearly and thus help in the early prevention and management of caries more effectively. Therefore, the aim of the present study is to determine the prevalence of dental caries and their association with demographic characteristics and oral hygiene practices among school children in the age group of 3 -12 years in Ludhiana City, Punjab.

SUBJECTS AND METHODS

A cross sectional epidemiological study was conducted among school children in Ludhiana city Punjab. Study was conducted on 1200 school children in the age group of 3-12 years who visited Christian Dental College Ludhiana, Punjab. Ethical clearance was obtained from the Institutional ethical committee of Christian Dental College, Ludhiana. Consent was obtained from parents before starting the study. Consented parents were asked to fill a self-administered questionnaire which included the questions regarding the child's age, sex, birth rank, socioeconomic status of family, child's brushing habits, teeth cleaning frequency and cleaning aids used. Socioeconomic status was measured using modified Kuppuswamy scale updated for the year 2019.[5] Clinical examination was done in the Dept. of Pedodontics, Christian Dental College Ludhiana. Dental caries was assessed using WHO modification of DMFT index.[6] In case of primary dentition def index givenwas used.[7] The recorded data was tabulated in spreadsheet computer program (Microsoft Excel 2016) and then exported to data editor page of SPSS version 2.0(SPSS Inc., Chicago, Illinois, USA) was and statistically analysed. The statistical test applied for the analysis was Pearson's chi-square test. The confidence interval and p-value were set at 95% and ≤0.05 respectively.

RESULTS

The study population consisted of1200 school children in the age group of 3-12 years. Out of 1200 children, 265 (22.1%)were in between 3-5 years age and 935 (77.9%) were in 6-12 years age group.585 (48.8%) were males and 615 (51.3%) were females. Distribution of data based on other demographic details are described in Table 1. 69.8%of the population who participated in the study visited dentist regularly at least once a year and 30.3% of population was visiting the dentist for the first time. When the brushing pattern was studied 64.9% of population brushes their teeth once a day and 29.2% of the population brushes twice a day.98.2% of population used tooth brush and tooth paste as cleaning aids. In the present study 62.1% of subjects were not assisted by their parents while brushing while 37.9% of subjects were assisted while brushing. (Table 2)

The overall prevalence of dental caries in the study population was found to be 80.1%. Caries prevalence in 3-5-year age group was found to 69.8% and 6-12 years of age group was found to be 83.0%. Caries prevalence in males was 79.0% and females showed slightly higher caries prevalence (81.1%). Caries prevalence and their association with demographic details and oral hygiene practices are described in Table 3 and 4.

Table 1: Distribution of data based on demographic details

Demographic factors associated	Frequency	Percentage(%)
Age		
3-5 years	265	22.1
6-12 years	935	77.9
Gender		
Male	585	48.8
Female	615	51.3
Type of school		
Private	1058	88.2
Government	142	11.8
Socio economic status		
Upper class	56	4.7
Upper middle class	387	32.3
Lower middle class	577	48.1
Upper lower class	167	13.9
Lower class	13	1.1
Rank of the child		
Elder	432	36.0
Middle	27	2.3
Younger	460	38.3
Single	281	23.4

Table 2: Distribution of date based on oral hygiene practices

Oral hygiene practices associated	Frequency	Percentage (%)
Frequency of cleaning		
Never	18	1.5
Once a week	0	0
Twice a week	53	4.4
Once a day	779	64.9
Twice a day	350	29.2
Type of cleaning aids used		
Tooth brush +tooth paste	1178	98.2
Tooth brush	12	1.0
Tooth powder	5	0.4
Finger	5	0.4
Rinsing	0	0
Others	0	0
Assistance while brushing		
Yes	455	37.9
No	745	62.1

Table 3: Association of caries prevalence with demographic factors

Demographic factors associated	Caries prevalence	p- value
Age		
3-5 years	69.8%	0.001 (Sig)
6-12 years	83.0%	
Gender		
Male	79.0%	0.348 (NS)
Female	81.1%	
Type of school		
Private	80.0%	0.437 (NS)
Government	81.1%	
Socio economic status		
Upper class	69.6%	0.193(NS)
Upper middle class	78.3%	
Lower middle class	81.6%	
Upper lower class	82.0%	
Lower class	84.6%	
Rank of the child		
Elder	80.1%	0.734(NS)
Middle	77.8%	
Younger	78.9%	
Single	82.2%	

*Test applied: chi-square test
†NS: statistically non-significant
‡Sig: statistically significant

Table 4: Association of caries prevalence with oral hygiene practices

Oral hygiene practices associated	Caries prevalence	p-value
Frequency of cleaning		
Never	72.2%	0.681 (NS)
Once a week	0%	
Twice a week	84.9%	
Once a day	79.8%	
Twice a day	80.3%	
Type of cleaning aids used		
Tooth brush +tooth paste	80.1%	0.458 (NS)
Tooth brush	66.7%	
Tooth powder	80.0%	
Finger	100.0%	

Rinsing	0	
Others	0	
Assistance while brushing		
Yes	78.2%	0.120(NS)
No	81.2%	

*Test applied: chi-square test
†NS: statistically non-significant
‡Sig: statistically significant

DISCUSSION

The overall prevalence in the study population was found to be 80.1%. The principal reasons for increased prevalence rates in the present study could be growing sugar consumption in the population and lack of proper oral hygiene practices. Similar prevalence rates were found by Ilaria Prada in Valencia, SpainBalloukand Dashash in Damascusand Sudha P et al in Mangalore city[7,8,9].This may be an indication of upward trend in the caries prevalence in developing countries. However, the area covered in the present study could also be factor affecting the prevalence.

Caries prevalence in 3-5-year age group was found to 69.8% and 6-12 years of age group was found to be 83.0%. An increasing trend of caries prevalence was seen as age increases and it was found to be statistically significant. As age increases there are multiple young primary and permanent teeth in the oral cavity and these teeth are prone to get affected by caries. Along with this, change in the dietary pattern and lack of proper oral hygiene practices can also be counted as major reasons of increased caries prevalence as age increases. Similar results were found by Sudha P et al ,Rao et aland Maj Saravanan S P et al . [10,11,12]

Higher caries prevalence was found in females (81.1%) than males (79.0%). This could be because of the difference in intake behaviours, hormonal fluctuations during puberty, social role in family and salivary flow rate between boys and girls and these similarities would make girls more susceptible to caries. The results were not found to be statistically significant eventhough there were variations in the prevalence rate. This could be because of the variation in geographical locations and variable age groups in the study population. Sudha P et al, Shetty and Tandon and Jai also found no significant difference in caries prevalence among both the genders.[10,13,14] Girls were found to have higher caries prevalence by Mishra and Shee, Saimbi et al, and Singh et al. [15,16]

Caries prevalence in the children who attended private school was 80.0% and in children who attended government school was 81.05%. According to the present study slightly higher caries prevalence was seen in government school even though the results showed no statistical significant association between type of school and caries prevalence. Similar results were reported by Maj Saravanan et al in their cross sectional study.[12] They concluded that government school children had higher caries prevalence than private school children.

Highest caries prevalence was seen in the lower socio economic status group and it was found to be 84.6% among the total population. It has been observed that families in low socio economic background often go into food shortage which critically affects the dietary habits of children and thus affects the oral health. Along with this, poor oral hygiene practices and lack of awareness could also be counted as reasons for increased caries prevalence in low socio economic class. The study showed no statistical association between caries prevalence and socio economic status of the children. This was in accordance with the studies done by Sudha P et al, Ghandour IA and T.A Oyedele et al. [10,17,18]

Single born child shows slightly higher caries prevalence (82.2%) in the present study. The reason may be because that the parents of only children may indulge them in high sugar containing diet and frequent refined carbohydrates between meals and also they tend to get pampered more since they are alone. However, there was no statistically significant association between the rank of the child and caries prevalence. A study done by T.A.Oyedele et al in Nigeria is in concordance with the present study.[18]

No statistically significant association was found between frequency of cleaning and type of cleaning aids and caries prevalence. Similar results were found by Maj Saravanan et aland Elamin et al.[12,19]

Another parameter that was under consideration was assistance during brushing. Even though slightly higher caries prevalence was seen in children who were not assisted while brushing, the results did not show any statistically significant association between assistance while brushing and caries prevalence. The reason might be because of the less manual dexterity while brushing especially in younger children which results in poor oral hygiene and poor oral health which increases the caries prevalence. Study done by Hallet K B and O Rourke PK also supports the results of the current study. [20]

CONCLUSION

From this study it was concluded that the overall prevalence of dental caries in 3-12 years age group in this area to be 80.1%. 69.8% of caries prevalence was found in primary dentition (3-5 years) and 83.0% of caries prevalence was found in mixed dentition (6-12 years). With regards to association, age was the only factor found to be statistically significant with caries

prevalence in the present study. Similar prevalence for caries was found in both genders while higher caries prevalence was found in low socio economic group and single child. Factors like cleaning frequency, cleaning aids, assistance while brushing and type of diet did not show any statistically association with caries prevalence. Results of this study reveals that there is a need of immediate educative and preventive programs in the population so as to improve the dental health. Having a healthy mouth is the key to having a healthy child.

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CONFLICTS OF INTERESTS
There are no conflicts of interest

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