Indian Dental Association Ludhiana
IDA LUDHIANA's JOURNAL:
Ie – Dentistry

Original Article

PREVALENCE OF DENTAL CARIES IN INDIA

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ABSTRACT

Introduction: Oral cavity consists of diverse niches and ample supply of nutrients which is undoubtedly conducive for the unrestricted formation of natural microbial biofilms. Oral microbial communities consist of more than 700 different bacterial species. Dental caries results from disturbance of the equilibrium of this complex ecosystem, where population shifts lead to overrepresentation of causative species which play a major role in initiation and progression of dental caries. Early detection with prompt treatment is necessary because of the unhealthy practice of children often leads to permanent damage of the permanent dentition and spread of infection throughout the body. Hence, the present study was conducted to evaluate the prevalence of dental caries among school children after the eruption of permanent dentition to find out the association of socio-demographic characteristics with the prevalence of dental caries. **Methodology:** The study was conducted in a high school. All the students of age 13-15 years were selected. So, they have complete eruption of permanent dentition with the exception for 3rd molar. The study was planned to conduct by interviewing the students using a pre-tested, pre-designed, semi-structured questionnaire and an examination to evaluate the condition of the teeth on the present day was assigned to be done by a dentist. **Results:** Majority of the students were 13 years and 14 years old (43.5% and 46.4% respectively). A small percentage (10.1%) of the students were 15 years old. 57.5% students were male and 42.5% were female. 67.8% students belonged to Hindu religion and the rest students were Muslims. As far as socio-economic status is considered, using modified Prasad scale, majority belonged to lower middle and upper lower socioeconomic class (25.5% and 31.5% respectively). Only 8.2% students belonged to upper class. 50.6% students had one sibling, 20.1% had two siblings and 29.3% students were the only child of their parents. The students were inquired about their habits and practices towards the dental health. 71.3% students used to brush once daily, 20.4% students had the brushing habit more than once daily and 8.3% students did not have the habit of brushing every day. They used to brush the teeth occasionally, not daily. The students were asked about the habit of washing mouth after taking food. It was found that majority (62%) had the habit of washing their mouth rarely, mainly after taking major meals, not after taking any other food. 25.5% student often washed their mouth after taking food and 12.5% students replied that they washed their mouth always after taking any meal. 60.3% students complained of toothache and the rest did not have any episode of toothache in last 15 days. 26.4% students were taking medicines for the toothache. According to physical examination, 82 (72%) students had dental caries. Various socio-economic parameters had been adopted to assess the prevalence of dental caries. It is seen that 69.2% of the students aged 13 years, and 85.88% of the students aged

more than 13 years had dental caries. So, prevalence of dental caries increased with increase in age and this difference is statistically significant (p=0.013). It was seen that 73.26% of boys had dental caries as compared to 68.75% girls having the same problem. However, this difference is not significant statistically. 70.58% Hindu students as compared to 62.5% of Muslim students had dental caries though the difference is not significant statistically. Median per capita income of the family of the students was found to be Rs. 1800/- and the students were grouped into two categories based on this median per capita income. It is seen that 80% of the students belonging to the less income group had dental caries in comparison to 60% students in higher income group and this difference is statistically significant. Prevalence of dental caries was assessed according to presence of siblings. It is observed that students having no sibling or one sibling were significantly less commonly suffering from dental caries as compared to students having more than one sibling. **Conclusion:** The data obtained from this study may provide actionable health information to guide public health policy and programs which are focussed at improving the oral health services available in India. Centres for Disease Control and Prevention (CDC) guidelines for evaluating public health surveillance systems around the globe recommends that the health-related events (in this case oral diseases and conditions) should be followed for surveillance if large number people are affected, those who require large expenditures of resources and are of public health importance. Based on these criteria, the outcomes of oral health, associated health behaviors and other factors linked to oral health should be included in public health surveillance systems.

Keywords: Dental caries, Prevalence, oral health data, geographical distribution

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How to cite: Sodhi GS. Prevalence of Dental Caries in India**.** IDA Lud J – *le* Dent 2017;1(2):50-57.

INTRODUCTION

Oral cavity consists of diverse niches and ample supply of nutrients which is undoubtedly conducive for the unrestricted formation of natural microbial biofilms. Oral microbial communities consist of more than 700 different bacterial species.[1] Dental caries results from disturbance of the equilibrium of this complex ecosystem, where population shifts lead to overrepresentation of causative species which play a major role in initiation and progression of dental caries. Even though dental caries is preventable, it is considered as one of the chronic diseases in larger population like India affecting both children and adults with a prevalence rate of 36.7% among 13 to 19-year-olds.[2] Untreated dental caries can cause pain and difficulties in eating and sleeping, which in turn leads to emergency dental visit, hospitalization, need for invasive treatment, and systemic health problems like diabetes, ischemic heart disease, chronic obstructive pulmonary disease, lower respiratory infections, and cerebrovascular disease thereby lowering the quality of life.[3] Inorder to overcome the high prevalence rate of dental caries in India, community- oriented preventive and education program is emphasized.[4] Oral health education programme is a cost-effective method for promoting oral health if educated through schools, to reach out all children irrespective of their socioeconomic status. [5] Tewari *et al* observed that daily tooth brushing habit became more frequent after a community education program on oral health. [6] Early detection with prompt treatment is necessary because of the

unhealthy practice of children often leads to permanent damage of the permanent dentition and spread of infection throughout the body. Hence, the present study was conducted to evaluate the prevalence of dental caries among school children after the eruption of permanent dentition to find out the association of socio-demographic characteristics with the prevalence of dental caries.

METHODOLOGY

The study was conducted in a high school. All the students of age 13-15 years were selected. So, they have complete eruption of permanent dentition with the exception for 3rd molar.

The study was planned to conduct by interviewing the students using a pre-tested, pre-designed, semi-structured questionnaire and an examination to evaluate the condition of the teeth on the present day was assigned to be done by a dentist.

Statistical analysis

The data generated were entered in Microsoft excel sheet and copied into a SPSS sheet (version 23.0). The analysis was done using SPSS (version 23.0). Chi square test was used to test the statistical significance between different groups.

RESULTS

Majority of the students were 13 years and 14 years old (43.5% and 46.4% respectively). A small percentage (10.1%) of the students were 15 years old. 57.5% students were male and 42.5% were female. 67.8% students belonged to Hindu religion and the rest students were Muslims. As far as socio-economic status is considered, using modified Prasad scale, majority belonged to lower middle and upper lower socioeconomic class (25.5% and 31.5% respectively). Only 8.2% students belonged to upper class. 50.6% students had one sibling, 20.1% had two siblings and 29.3% students were the only child of their parents.

The students were inquired about their habits and practices towards the dental health. 71.3% students used to brush once daily, 20.4% students had the brushing habit more than once daily and 8.3% students did not have the habit of brushing every day. They used to brush the teeth occasionally, not daily. The students were asked about the habit of washing mouth after taking food. It was found that majority (62%) had the habit of washing their mouth rarely, mainly after taking major meals, not after taking any other food. 25.5% student often washed their mouth after taking food and 12.5% students replied that they washed their mouth always after taking any meal. 60.3% students complained of toothache and the rest did not have any episode of toothache in last 15 days. 26.4% students were taking medicines for the toothache.

According to physical examination, 82 (72%) students had dental caries. Various socio-economic parameters had been adopted to assess the prevalence of dental caries. It is seen that 69.2% of the students aged 13 years, and 85.88% of the students aged more than 13 years had dental caries. So, prevalence of dental caries increased with increase in age and this difference is statistically significant (p=0.013). It was seen that 73.26% of boys had dental caries as compared to 68.75% girls having the same problem. However, this difference is not significant statistically. 70.58% Hindu students as compared to 62.5% of Muslim students had dental caries though the difference is not significant statistically. Median per capita income of the family of the students was found to be Rs. 1800/- and the students were grouped into two categories based on this median per capita

Table 1: Socio-demographic characteristics of the study population

Socio-demographic parameters		Number	Percentage
Age	13	65	43.5%
	More than 13 years	85	56.5%
Sex	Male	86	57.5%
	Female	64	42.5%
Religion	Hindu	102	67.8%
	Muslim	48	32.2%
Socio-economic status	Upper	12	8.2%
	Upper middle	19	12.3%
	Lower middle	38	25.5%
	Upper lower	47	31.5%
	Lower	34	22.5%
Siblings	None	44	29.3%
	One	76	50.6%
	More than one	30	20.1%

Table 2: Habits of the study population

Parameters		Number	Percentage
Brushing the teeth	Twice daily	31	20.4%
	Once daily	107	71.3%
	Not everyday	12	8.3%
Washing mouth after taking food	Always	19	12.5%

	Often	38	25.5%
	Rarely/ only after taking major meals	93	62%
Toothache in last 15 days	Yes	90	60.3%
	No	60	39.7%
Taking medicine due to toothache	Yes	40	26.4%
	No	110	73.6%

Table – 3: Habits of the study population.

Parameters		**Dental Caries**		**Total**
		Present	**Absent**	
Age	13 years	45 (69.2%)	20 (30.77%)	65 (100%)
	14 years	73 (85.88%)	12 (14.12%)	85 (100%)
	Chi square= 6.08, p=0.013,			
Sex	Male	63 (73.6%)	23 (26.74%)	86 (100%)
	Female	44 (68.75%)	20 (31.25%)	64 (100%)
	Chi square= 0.36, p=0.54,			
Religion	Hindu	72 (70.58%)	30 (29.41%)	102(100%)
	Muslim	30 (62.5%)	18 (37.5%)	48 (100%)
	Chi square= 0.98, p=0.32,			
Per capita monthly income	Up to Rs. 1800/-	60 (80%)	15 (20%)	75 (100%)
	Above Rs. 1800/-	45 (60%)	30 (40%)	75 (100%)
	Chi square= 7.14, p=0.0075			

income. It is seen that 80% of the students belonging to the less income group had dental caries in comparison to 60% students in higher income group and this difference is

statistically significant. Prevalence of dental caries was assessed according to presence of siblings. It is observed that students having no sibling or one sibling were significantly less commonly suffering from dental caries as compared to students having more than one sibling.

DISCUSSION

As we all know that dental caries is one of the major dental related health problems that is more common in school going children as well as in adults. The World Health Organization (WHO) has theorized dental caries as a globally involved and reported its prevalence among various school children with a wide range from 60-90%.[7] Current study has been found out the prevalence of dental caries which is as high as 72% in the rural adolescents in India. Another study by *Shingare* et al[8] in Maharashtra, India observed the prevalence of dental caries among 3-14 years old children which is found to be 80.92% which is reportedly higher than the results obtained in the present study. *Dixit* et al[9] conducted a study among school children in Nepal and they found that the dental caries prevalence among the school children aged 12-13 years was 41% which is far below the prevalence observed in the present study. In Kenya, *Ng'ang'a* and *Valderhaug*[10] reported a prevalence of 40-50% among children aged 13-15 years. Another study was conducted by *Kassim* et al[11] in Nairobi in 2006 which revealed that the prevalence is around 43% among rural adults

In our study, the prevalence of dental caries was higher in girls (68.75%) than in boys (73.26%). *Dixit* et al[9] also reported a higher prevalence among girls (48.4%) than in boys (32%) although the overall prevalence in their study was lower than what is observed in the present study. Similar to our findings, there was no significant difference in prevalence between girls and boys. *Gathecha* et al[12] reported that the difference of prevalence of dental caries between boys and girls are not significant. Contrary to our report and the report of *Dixit* et al[9] *Natapov* et al[13] reported a higher prevalence among 5 years old boys than girls.

The current study found that the prevalence of dental caries was significantly higher in lower income group as compared to upper income group. Usually, people in the lower income group are devoid of hygienic practice and they live in unhygienic environment. These factors often lead to dental caries. Prevalence of dental caries was significantly higher among children having more than one brother. Usually when the number of children increases, the amount of care given by the mother to the elder child usually lessens which proves the higher prevalence of dental caries. As a result, the prevalence of diseases related to hygiene increases and students were asked about their habit of brushing the teeth and it is revealed that those who used to brush twice a day had significant less prevalence of dental caries as compared to those whose brushing habit is either once daily or not every day. *Gathecha* et al[12] in a study in Kenya have found that brushing habit has no significant effect on the prevalence of dental caries which is contradictory to the results of present study.

Dental caries is not only a medical or dental problem but pose a major dramatic change in the society. Awareness among students should be generated by the school teachers since they play a major role in the growing stage of a kid. Even parents should be aware of the dental health of their children. Parent/teacher meetings should be regularly planned and conducted during which parents are educated about the importance of good hygiene practices in the prevention of dental caries. Health education should be

included within the regular activities of the school.

CONCLUSION

The data obtained from this study may provide actionable health information to guide public health policy and programs which are focussed at improving the oral health services available in India. Centres for Disease Control and Prevention (CDC) guidelines for evaluating public health surveillance systems around the globe recommends that the health-related events (in this case oral diseases and conditions) should be followed for surveillance if large number people are affected, those who require large expenditures of resources and are of public health importance. Based on these criterion, the outcomes of oral health, associated health behaviors and other factors linked to oral health should be included in public health surveillance systems.

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Conflict of Interest : None **Source of Support: Nil**