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Correlation of dental caries and brushing frequency among government primary school children of Kohka –Kurud bhilai-A cross sectional study

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Abstract:

Introduction: The World Health Organization reports that 60–90% of schoolchildren worldwide have experienced caries, with the disease being most prevalent in Asian and Latin American countries. Caries can lead to poor performance in school and, if left untreated, can cause abscesses and even death.

Aims & Objective: To assess the association between dental caries and tooth brushing frequency among primary school children Kohka – Kurud villege bhilai.

Methods: A descriptive cross-sectional study was conducted among 6–11-year-old schoolchildren of the schools in Kohka – Kurud village Bhilai. Brushing frequency was assessed through a pre-tested, structured questionnaire. Dental caries assessment was done by using the DMFT/def index. The clinical examination was performed using a sterile mouth mirror and an explorer. The recording of data was done by a single assistant throughout the study. Descriptive statistics were used for age, sex, and frequency of brushing, and the Chi square test was used to determine the association between the dental caries score and tooth brushing.

Results. Among the 300 schoolchildren who participated in the study, the caries prevalence was found to be 75.7%. The mean and standard deviation of DMFT were found to be 0.42% (+0.68) for boys and 0.35% (+1.39) for girls, while the mean and deviation of def were found to be 1.19 (+1.25) for boys and 1.39 (+1.39) for girls. The comparison of brushing frequency and DMFT was found to be 0.47 (+0.63) for those who do not brush, 0.28 (+0.56) for those who brush once a day, and 0.18 (+0.35) for those who brush more than once a day. When the Chi square statistic was applied, a highly significant association was found across all the groups: (p =0.001)

Conclusions: From this study, we can suggest that the provision of oral health education in schools with proper instructions on oral hygiene practices and school-based preventive programs will probably be important for the maintenance and further improvement of oral health in primary school children.

Keywords: Dental caries, Brushing frequency, Kohka- kurud Primary School.

INTRODUCTION

Dental caries is considered a major public health problem due to its high prevalence and significant social impact. The 2004 National Pathfinder Survey shows that 58% of 5- to 6-year-old schoolchildren suffer from dental caries, with a caries prevalence of 58%. The survey reported pain and discomfort due to untreated dental caries in 18% of 5- to 6-year-olds. [1,2]

Dental caries is a multifactorial disease resulting from a variety of etiological factors, such as dental plaque retention due to poor oral hygiene, cariogenic bacterial colonization, and ingestion of cariogenic substrate. [3] Various risk factors contribute to its occurrence, including age, sex, diet, and socioeconomic factors. [4] Dental caries, not only causes pain, suffering, and discomfort but also, in addition, places a financial burden on the person. It is an infectious microbial disease in which diet, host, and microbial flora interact over a period of time in such a way as to encourage demineralization of the tooth enamel with resultant caries formation. [5]

The Indian population shows that the prevalence of dental caries is very high in some areas and low in others. Hence, it is necessary to know the prevalence and distribution of oral health problems and understand the dental health practices that people follow. The children in schools are relatively accessible, compared to any other population groups, for any health promotion programs aimed at effecting lifestyle changes. The unique characteristic of oral and dental diseases is that they are universally prevalent, do not undergo remission or termination if untreated, and require technically demanding expertise and time-consuming professional treatment. [6]

The prevalence is even higher in rural people and among schoolchildren. The reason for the disparity in dental caries among both rural and urban schoolchildren could be a lack of parental knowledge regarding the maintenance of oral health care or inaccessibility to affordable dental services. The most effective methods to prevent dental caries are proper oral hygiene practices and the maintenance of oral hygiene. A number of steps can be taken to reduce the risk of caries, including appropriate oral hygiene practices using brushing devices and techniques [7].

Till date, no study has been conducted in kohka – kurud schoolchildren; hence, this study was done with the aim of assessing the association between dental caries and brushing frequency in primary school children in kohka – kurud bhilai.

MATERIALS AND METHODS

A cross-sectional study was conducted among 6–11-year-old government primary school children in Kohka – Kurud Bhilai, Chhattisgarh, to assess the association between dental caries and brushing frequency. A non-probability convenient sampling was followed in the present study.

Inclusion criteria include all the students who were available at the time of study and whose parents gave consent to participate in the study. Exclusion criteria include students who were absent on the day of the examination and who did not provide the consent form.

Before the start of the study, ethical clearance was obtained from the institutional ethical clearance committee of Rungta College of Dental Sciences and Research. Permission to carry out the study was obtained from the headmaster of the school. Informed consent forms along with information sheets in the local language were sent to the parents of the children and obtained back through the teachers.

The investigator was calibrated by the senior research guide prior to the study. The investigator was trained and calibrated by carrying out training on the preselected subjects, who were not included in the main sample. The intra-examiner reliability was found to be good, with a kappa coefficient of 85%.

The pre-tested structured questionnaire was used to collect necessary demographic information and data

regarding oral hygiene practices and knowledge.

The examination and data collection were calculated to take 5 minutes for each subject. The daily schedule was prepared, and on a single day not more than 50 students were examined. A total of 300 students were examined in the premises of the school, where sufficient natural daylight was available, and made to sit on a chair with the examiner standing behind the chair. The examiner examined the subject and called out the scores of each item of examination clearly, and the recording assistant then entered it in the appropriate place in the proforma.

A clinical examination was carried out according to the WHO basic oral health survey methodology (1997) using a sterile mouth mirror and an explorer under aseptic conditions. Carious lesions were diagnosed by the DMFT/def index (Henry Klein, Carole Palmer, Kuntson, 1938, and Gruebbel, A.O., 1944) [8].

Statistical analysis

The data obtained from the present study was compiled and organized using Microsoft Office Excel software (version 2007), and analysis was performed using Statistical Package for Social Sciences Software (SPSS version 21, USA). A p-value of ≤ 0.05 was considered statistically significant. Descriptive statistics were employed for age, sex, and brushing frequency. A chi-square test assessed the association between dental caries score and brushing frequency, while a t-test compared the means of two groups.

RESULTS AND DISCUSSION

In the present study population consists of 300 schoolchildren, out of which 165 (55%) were boys and 135 (45%) were girls. Among them, 120, 93, and 87 children belonged to 6-7, 8-9, and 10-11 years, respectively.

Table 1 frequency of tooth brushing habits in particular age groups.

Age Groups	Frequency of Brushing			Total
	0/day	1/day	2/day	
	N(%)	N(%)	N(%)	
6-7 Year	39(32.5)	48 (40)	33(27.5)	120
8-9 Year	6 (6.5)	60(64.5)	27 (29)	93
10-11 Year	0	54(62.1)	33(37.9)	87
Total	45	162	93	300

Table 1 describes In the age group of 6-7 years, 39 (32.5%) children were not brushing daily, 48 (40%) children were brushing once daily, and 33 (27.5%) children were brushing teeth more than once daily. In the age group 8–9 years, 6 (6.5%) children were not brushing daily, 60 (64.5%) children were brushing daily, and 27 (29%) children were brushing their teeth more than once daily. In the age group 10–11 years, 54 (62.19%) children's teeth are brushed once a day, and 33 (37.9%) children's teeth are brushed more than once a day.

Table 2: The mean and standard deviation of DMFT and def among boys and girls.

	Males	Females	Student 't' test Value	Significance 'P' Value
	Mean (SD)	Mean (SD)		
Mean DMFT	0.42 (0.68)	0.35 (0.60)	12.56	0.01(S)
Mean def	1.19 (1.25)	1.39 (1.09)	15.89	0.002 (HS)

Table 2 describes the mean and standard deviation of DMFT and def. The mean and standard deviation of DMFT were found to be 0.42 (0.68) for boys and 0.35 (0.60) for girls, while the mean and standard deviation of def were found to be 1.19 (1.25) for boys and 1.39 (1.09) for girls.

.Table 3. The mean and standard deviation of DMFT and def among different age groups..

Age Group	Mean DMFT	Mean def
	Mean (SD)	Mean (SD)
6-7 Year	0.15 (0.42)	1.80 (1.52)
8-9 Year	0.13 (0.33)	1.16 (1.17)
10-11 Year	1.0 (0.75)	0.9 (0.74)

Table 3 Shows the mean and standard deviation of DMFT were 0.15 (40.42), 0.13 (40.33), and 1.0 (75) for 6-7 years, 8-9 years, and 10-11 years, respectively. Whereas the mean and standard deviation of def in the

6-7 years, 8-9 years, and 10-11 years age groups were found to be 1.80 (1.52), 1.16 (+1.17), and 0.9 (0.74), respectively.

Table 4. The mean and standard deviation of DMFT and def according to brushing frequency

	Do not Brush	Once in a day	More than once in a day	ANOVA 'F' Value	Significance 'P' Value
	Mean (SD)	Mean (SD)	Mean (SD)		
DMFT	0.47 (0.63)	0.28 (0.56)	0.18 (0.35)	15.529	0.001(HS)
Def	3.4 (0.89)	1.28(1.01)	0.26 (0.44)	67.643	0.001 (HS)

Table 4 shows a comparison of brushing frequency with DMFT and def. When ANOVA test was applied, a highly significant **association** was found across all the groups ($p = 0.001$).

Table 5. Correlation statistics between tooth brushing frequency and dental caries status

Brushing frequency	Dental caries status	Correlation coefficient (r) value	Significance 'P' Value	Interpretation
Once	54	-0.65	0.001 (s)	Strong Negative correlation
More than once	36	-0.74	0.023(s)	Strong Negative correlation
nil	108	-0.84	0.036 (s)	Strong Negative correlation

Table 5. Describe the correlation statistics between tooth brushing frequency and dental caries status. It was evident that school children brushing once had a strong negative correlation with dental caries this was found to be statistically significant. ($p \leq 0.05$) Brushing twice showed that there was a strong negative correlation among tooth brushing and dental caries which was found to be statistically significant. ($p \leq 0.05$)

Brushing nil had a strong Negative correlation with dental caries as it suggested reduce in brushing or no

brushing increase dental caries drastically, this was found to be statistically significant. ($p \leq 0.05$)

The World Health Organization (WHO) has recognized dental caries as a pandemic and reported its prevalence among schoolchildren to range from 60–90%. [9]

Dental caries is most prevalent oral disease in several Asian and Latin countries. In many developing countries, access to oral health services is limited and teeth are often left untreated or are extracted because of pain or discomfort. Throughout the world, tooth loss is still seen as a natural consequence of ageing. There has been a positive trend of reduction in tooth loss in some industrialized countries among adults in recent years.[10]

Rao and Bharambe found in their study that 60.8% of children were habituated to clean their teeth with toothpaste and toothbrushes, which is comparatively lower than the 85% in our study. [11]

According to our study, the prevalence of decayed teeth was significantly more among children who did not brush in comparison to those who brush regularly. The results of our study are similar to the study conducted by Tadakamadla K S et al[12] in Udaipur in 2012 respectively where they found that decayed teeth prevalence was more among children who do not brush their teeth daily or less often daily when compared with those who brush daily or twice a day.

Similar study was conducted by Chu C H et al[13] in Hong Kong and it was found that children who brushed their teeth twice a day had a lower mean deft score than those who brushed only once a day or less often. In our study, the explanation to the brushing frequency can be given as oral diseases are clearly related to behaviour, and dental caries prevalence has decreased with improvements in oral hygiene. Poor oral hygiene was a risk factor for developing dental caries.[14] For plaque removal from tooth surface, tooth brush is more effective. The low dental caries prevalence in tooth brush users may be due to the reason that tooth brush bristles could reach and clean those inaccessible areas of oral cavity that might not be accessible to the finger and other materials.[15]

The finding of a significant difference in caries prevalence between those children who did not brush regularly and those who brushed at least once a day is strong support for the effectiveness of regular use of toothpaste and toothbrushes for caries prevention.

Comprehensive school health programs can cause a dramatic "ripple effect," resulting in changes in the attitudes, knowledge, and behavior of school-aged children and also the entire community.

Conclusion

From this study, we can suggest that the provision of oral health education in schools with proper instructions on oral hygiene practices and school-based preventive programs will probably be important for the maintenance and further improvement of oral health in primary school children.

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