

PREVALENCE OF CARIES IN SCHOOL CHILDREN OF PESHAWAR

Umema Zafar¹, Junaid Ahsan², Adeela Mustafa³, Ahmad Azam Malik⁴, Nimra Zafar⁵, Mahnoor Inamullah⁵, Nayab Ahsan⁵

¹ Physiology Department, Khyber Medical College, Peshawar.

² Community Medicine Department, Gajju Khan Medical College, Swabi.

³ Community Medicine Department, Khyber Medical College, Peshawar.

⁴ Department of Family and Community Medicine, Rabigh Medical College, King Abdul Aziz University, Jeddah.

⁵ Graduate, Khyber Medical College, Peshawar.

Abstract

Objective: To determine the frequency and causative factors for dental caries in school going children of age 10-12 years.

Materials & Methods: It was a cross-sectional study in which 180 school going children of private and public schools were included through convenient sampling technique. The data was collected from June 2017 to August 2017. Prior permission was obtained before the examination. Data analysis was done through SPSS version 20.

Results: Among 180 children, 66.66% were male, and 44.44% were female. The overall prevalence of caries was 64.38%. Regular brushing was done by 27.78% of the children, while 36.67% brushed their teeth irregularly. Majority of the children used toothpaste to clean their teeth, while 3.5% used Miswak. 57.2%, children who used sweet and toffees had caries. Most of them knew of oral hygiene. Prevalence was 8% lower in those who brushed twice daily rather than those who brushed only once.

Conclusion: Regular brushing practices and techniques were not satisfactory among school children, although knowledge about oral hygiene was satisfactory.

Key Words: Dental caries, Teeth, Frequency, Children

Introduction

Caries is one of the most prevalent diseases of the teeth, and it affects individuals of all ages including children. Dental caries is an infectious process, which involves localized dissolution and destruction of the teeth¹. The earliest theory was the “tooth worm theory” proposed by the ancient Chinese. In Pakistan specimens of teeth found from around 5500 BC to 7000 BC show signs of primitive dental work. In 350 BC Aristotle described that figs and sweets cause tooth decay if not cleaned afterwards².

S.mutans and *Streptococcus sobrinus* are the main organisms that lead to caries. Increased consumption of sugary foods is the main risk factor for caries³. Caries is diagnosed via checking the number of teeth missing or filled with the help of a mouth mirror and light source⁴.

Dental caries affects 60-90% of school going children in most developed countries. In several developing countries the prevalence rates of dental caries are increasing^{5, 8, 11, 18}.

Twelve-year-old children represent a standard age category used by the World Health Organization to assess and compare dental caries levels in the permanent dentition of children worldwide. WHO

Correspondence:

Umema Zafar

Physiology Department, Khyber Medical College, Peshawar.

E-mail: umema.com@gmail.com

goal of decayed, missing and filled teeth (DMFT) index is 3 for 12-year-olds? While WHO global data showed an increase in DMFT of 12 years old Pakistani children from 0.9 to 1.38. Dental caries is the basic problem in school going children. Dental caries is not only a medical problem but also a social problem⁵.

A study conducted among school children aged 8-15 in rural Punjab of India showed caries prevalence to be 36.5%⁶. A survey conducted among 500 school children of Peshawar showed the prevalence of dental caries to be 72.4% with a mean DMFT score of 2.163. It was observed that teeth brushing practices were unsatisfactory among 76% children; moreover, sweet consumption was also high⁷.

Dental caries is the most prevalent chronic disease among children. It is seven times more common than seasonal allergies, and it is the fourth most expensive disease to treat. Treating it would require the US \$3513 per 1000 children, which would exceed the health budget of most low-income countries⁸. The risk factors for dental caries include improper or irregular brushing practices, excess sweet consumption, poor socioeconomic conditions, insufficient fluoride exposure and high illiteracy rate⁹.

A tooth weakened by decay can fracture under normal chewing pressure. Dental caries can affect the life of any person physically, socially and psychologically¹⁰.

When the infection progresses to the pulp tissue toothache develops. Death of pulp tissue and disseminated infection are extreme and terminal consequences of tooth decay. Dental caries also causes foul breath and bad taste³. Other consequences include emergency dental visits, missed school days, diminished ability to learn and financial burden on the parents¹⁰.

This study aimed to investigate the prevalence of dental caries among school going children aged 10-12 years in Peshawar, Pakistan. Another objective is to identify the risk factors for dental caries.

Materials and Methods

This was a cross-sectional study, which was carried out in Peshawar to assess the prevalence of dental caries among school children. The study was carried out on 180 children of school going age. This study was carried out in seven different schools of

Peshawar, which included three private and four public schools of different socioeconomic status. Children selected were of age group 10-12 years. Age was recorded from school records. Prior permissions and consents were obtained from school authorities. A self-administrated questionnaire (Based on WHO basic oral health survey form) was filled, and oral consent from the participants was taken before the study. Different questions were asked of the students, they were asked by the examiners, and their answers were filled by the examiner. This study was completed in three months, by ten examiners. The children were examined individually in the school premises by one of the ten examiners on a simple straight wooden chair using mouth mirrors and a light source. The examination was done under natural daylight using WHO criteria after obtaining consent from parents a week before by sending off those forms in children's diaries. (4) A detailed history of all children was recorded, which included their name, age, sex, class, religion, parent's occupation, oral hygiene practice and teeth identification. Inclusion criteria include school children aged 10-12 years, school children who were residents of district Peshawar, while exclusion criteria include individuals suffering from systemic illness, individuals who were not willing to participate in the study or whose parents refused, individuals with orthodontic brackets and with severe extrinsic stains on their teeth

Frequencies and odd's ratios were calculated by using SPSS version 20.

The frequency of caries in those who brushed regularly twice a day was 27.78% (50/180). And frequency in those who brushed irregularly or did not brush at all was 36.67% (66/180). The odds ratio is 8.06, hence So Those children who brush their teeth regularly are 8.06 times less likely to developed dental carries compared to those who do not brush their teeth regularly.

It has also been noted in the study that in children who brushed before going to bed, the frequency was 31.57% (57children), which is low as compared with those children who only brush in the morning, which is 39.3% (71 children).

The frequency of dental caries in those children who used to eat sweets was 57.2%, which is high as compared with those children who do not eat excess sweets which is 7.2% as shown in table 5, Odds ratio

is 5.42, so chances of having caries on a sweet, rich diet are 5.4 times more than on a sugar free diet.

The frequency of caries was high in those children who belong to poor and uneducated families, which is 41.54%. The frequency of caries was 24.26% in those children who brush their teeth with fluoridated toothpaste, which was low as compared with those who used non-fluorinated agents or other methods which do not contain fluoride which is 40.12%. Majority of school children knew about good oral hygiene practices.

Results

A total of 180 school children aged 10-12 years were examined for frequency of dental caries and out of these, 100 students were male while 80 students were females. The overall frequency of dental caries was 64.38%.

The frequency of dental caries was 68% in males and 60% in females according to table 1.

The overall frequency of caries in the maxillary arch was 35.85% and in the mandibular arch was 27.4%.

Discussion

The results of this study showed that the overall prevalence of caries was high which is similar to other studies conducted in Khyber Pakhtunkhwa. A study conducted in Lahore found that the prevalence of caries was 71%¹¹. Another study conducted in Sargodha district mentioned the prevalence of 45.9%¹².

The prevalence in males was high in this study with a ratio of 1 carious female to 1.13 males. There are conflicting results regarding gender wise prevalence in various studies. In one study conducted in India, prevalence was higher in boys compared to girls¹³. Another Indian study showed that prevalence was higher in girls than in boys¹⁴. A study conducted in Karachi, Pakistan found that prevalence was greater in males than in females¹⁵.

Overall dental carries were higher in a maxillary arch rather than mandibular. According to WHO 12 years is the high index age for dental caries because at that time all the molars except the 3rd one have erupted. Molars have the highest chances of getting carious¹⁶. The age wise in this study showed that as age increases fall, hence younger kids have higher

Table 1: Gender wise frequency of dental caries

Gender			Total
	No	Yes	
Female	32	48	80
Male	32	68	100
Total	64	116	180

Table 2: Age-wise frequency of dental caries

Gender	Age wise frequency of dental caries			Overall frequency		
	10 years	11 years	12 years	10 years	11 years	12 years
Male	16.7%	10.96%	9.4%	28.91%	18.97%	16.5%
Female	12.21%	8.01%	7.1%			

Table 3: Caries frequency according to brushing

Brushing	Caries positive		Total
	Yes	No	
No	66	9	75
Yes	50	55	105

of caries.

The odds of getting caries was eight times higher in those who did not brush or brushed irregularly rather than those who brushed regularly. According to a KAP study, a total of 93% of children never visited a dentist or a health care service. 56% brushed their teeth once a day and 24% reported brushing their teeth twice daily. About 86% of the children reported using a toothbrush and toothpaste to clean their teeth.

In the present study, the frequency was higher in those children who only brushed in the morning rather than those who also brushed at night. In the same study, the odds of getting caries was 5.4 times on sugar-containing diet rather than on a diet which had less or no sugar. According to the National Diet and Nutrition Survey of Children conducted in Britain, there was a positive association between the prevalence of caries and the monthly household spending on confectionery¹⁷.

In the present study prevalence of caries in families of poor socioeconomic status and low education level was 41.54%. A study conducted in Baghdad, Iraq and another conducted in Trinidad showed similar results^{18, 19}.

Proper brushing and flossing daily lead to good personal hygiene^{5, 11 20}. The purpose of oral hygiene is to minimize any etiologic agents of disease in the mouth.

The following are the limitations of the present study. Since this study was a field survey, therefore, radiographs were not used in the identification and diagnosis of dental caries. It is likely, therefore, that the prevalence of dental caries may have been under-estimated. Moreover, the schools allowed limited time for examination so a more detailed assessment could not be conducted.

Conclusion

Overall, the prevalence of Dental caries was moderately high. The prevalence of caries increases with the sweets intake. Regular brushing practice was not found satisfactory among school children. The frequency of caries in school going children of Peshawar is high, as compared with that of the WHO. Dental caries would be prevented by appropriate hygienic ways. Dental awareness among students and their parents should be prompted for the prevention

of this condition.

References

1. Bowen WH. Dental Caries [Internet]. 2016. 1046-1053 p. Available from: <http://link.springer.com/10.1007/978-3-662-47450-1>
2. NHS. Tooth Decay [Internet]. Wikipedia. 2016. Available from: <http://www.nhs.uk/conditions/Dental-decay/Pages/Introduction.aspx>
3. Çolak H, et al. Early childhood caries update: A review of causes, diagnoses, and treatments. *J Nat Sci Biol Med.* 2013;4:29–38.
4. WHO_TRS_242.pdf.
5. Bordoni N, Doño R, Manfredi C, Allegrotti I. Prevalence of dental caries in twins. *ASDC J Dent Child.* 1973;40:440–3.
6. Plaka K, Ravindra K, Mor S, Gauba K. Risk factors and prevalence of dental fluorosis and dental caries in school children of North India. *Environ Monit Assess [Internet].* 2016;189:40. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2781791&tool=pmcentrez&rendertype=abstract>
7. Umer A, Umer A. Prevalence of Dental Caries Among the Primary. *JKCD.* 2011;2:2–7.
8. NIH. Oral Health in America: A Report of the Surgeon General (Executive Summary) [Internet]. 2000. Available from: <https://www.nidcr.nih.gov/datastatistics/surgeongeneral/report/executivesummary.htm#execSumm>
9. Selwitz RH, Ismail AI, Pitts NB. Dental caries. *Lancet.* 2007;369:51–9.
10. Opondo IA, Kemoli AM, Ngesa JL. Impact of dental caries on the oral health-related quality of life of urban slum children in Nairobi, Kenya. *Edorium J Dent.* 2017;4:12–8.
11. Ali S, Bhatti MUD, Syed A, Chaudhry AUH. Prevalence of dental caries among 5-14 Years old poor locality school children of Lahore. *Pakistan Oral Dent J.* 2012;32:279–82.
12. Umer MF, Farooq U, Shabbir A, Zofeen S, Mujtaba H, Tahir M, et al. Prevalence and Associated Factors of Dental Caries, Gingivitis, and Calculus Deposits in School Children of Sargodha District, Pakistan. *J Ayub Med Coll.* 2016;28:152–6.
13. Hiremath A, Murugaboopathy V, Ankola A V, Hebbal M, Mohandoss S, Pastay P. Prevalence of Dental Caries Among Primary School Children of India - A Cross-Sectional Study. *J Clin Diagn Res.* 2016;10: ZC47-ZC50.
14. Arangannal P, Mahadev SK, Jayaprakash J. Prevalence of dental caries among school children in Chennai, based on ICDAS II. *J Clin Diagnostic Res.* 2016;10: ZC09-ZC012.

15. Dawani N, Nisar N, Khan N, Syed S, Tanweer N. Prevalence and factors related to dental caries among pre-school children of Saddar town, Karachi, Pakistan: a cross-sectional study. *BMC Oral Health*. 2012;12:59.
16. Goel R, Vedi A, Veerasha K, Sogi G. Oral hygiene practices and dental caries prevalence among 12 & 15 years school children in Ambala, Haryana -A cross-sectional study. *J Clin Exp Dent*. 2015;7:e374–9.
17. Gibson S, Williams S. Dental Caries in Pre-School Children : Associations with Social Class, Toothbrushing Habit and Consumption of Sugars and Sugar-Containing Foods. *Caries Res*. 1999;33:101–13.
18. Ahmed N, Astrøm A, NS, PE. P. Dental caries prevalence and risk factors among 12-year-old schoolchildren from Baghdad, Iraq : a post-war survey. *Int Dent J*. 2007;57:36–44.
19. Naidu R, Nunn J, Donnelly-swift E. Oral health-related quality of life and early childhood caries among preschool children in Trinidad. *BMC Oral Health*. 2016;3:128.
20. Bratthall D, Petersen PE, Stjernswärd JR, Brown LJ. Chapter 38 Oral and Craniofacial Diseases and Disorders [Internet]. 2nd ed. Jamison DT, Breman JG, Measham AR et al., editor. *Oral and Craniofacial Diseases and Disorders*. Washington (DC): Oxford University Press; 2006. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK11725/>