

ORAL HEALTH BEHAVIOUR AND PREVALENCE OF DENTAL CARIES IN 12-15 YEARS OLD SCHOOL GOING CHILDREN IN DISTRICT KOHAT: A CROSS-SECTIONAL SURVEY

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Abstract

Objective: To estimate the prevalence of dental caries, and to assess the knowledge, attitude, practices about oral health behavior in 12-15 years old school children in district Kohat.

Materials and Methods: This cross sectional survey was conducted for a period of six months and information was collected from 395 school children; aged 12-15 years from 8 different schools of district Kohat using simple random sampling technique. The handicapped children and those with congenital disorders were excluded. A written consent was taken with the help of district education officer Kohat and school principal from the parents of school children. A clinical examination was done to record Caries experience according to the WHO criteria as decayed, missing, filled teeth (DMFT). The collected data was analyzed using SPSS version 16.

Results: The mean DMFT for 395 children was 1.0. However, the mean DMFT score for urban school children was 1.0 and for children from rural schools of district Kohat was 0.99 respectively. A mean DMFT score of 1.0 though is considered low, but the D (decayed) component was higher as compared to M (missing) and F (filling), which shows unsatisfactory attitude towards the utilization of dental services.

Conclusion: It was concluded that knowledge of school children towards dental health and oral hygiene is satisfactory. However, there is room for improvement in practices of school children towards dental health and dental service utilization.

Key Words: Dental Caries, Prevalence, Oral health Behavior.

Introduction

Dental caries is a chronic infectious disease, generally believed to be caused by acid producing Mutans. Streptococci and Lactobacilli bacteria.¹ Severe dental decay in children can cause pain, sleeping problems, troubled eating and behavior problems.² Dental caries is considered to be a major public health problem globally due to its high prevalence and significant social impact. World Health Organization reports 60-90% of school children worldwide have experienced caries.²

The distribution and severity of dental caries vary in different parts of the world and within the same country or region.³ An estimated 90% of school children worldwide and most adults have experienced dental caries with the disease being most prevalent in Asia and Latin American countries and least prevalent in African countries.⁴ In the United States,

dental caries is the most common chronic childhood disease and it is at least 5 times more common than asthma.⁵

Dental caries is irreversible at the cavitation stage. It is the primary cause of tooth morbidity and mortality in children. Furthermore, it causes severe pain and suffering and hence impacts on both function and quality of life¹. Many industrialized countries have experienced a decline in the dental caries prevalence over the past decade. This trend in decrease of dental caries may be attributed to many factors, the important factors are, improved oral hygiene, better and sensible approach to the sugar consumption, effective use of fluorides and school based preventive programs, but at the same time there is increase in prevalence of the dental caries in developing countries where preventive programs have not been established³. Dental caries can be modified by the diet. The biological mechanisms of dental caries are well established. It is a disease with number of important etiological factors like fermentable carbohydrates, cariogenic microorganisms and susceptible tooth surfaces⁵.

Infancy and childhood are the most valuable period of dental growth; thus educating parents about children dental care is of critical important during these periods. Both

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American Association of pediatrics (APP) and American Association of Pediatric parents are considered as a valuable resource in fostering optimal health in their children. Dental and oral health are effected by diet and certain aspects of lifestyle.⁶ Diet affects the integrity of the teeth, quantity, PH and composition of the saliva and plaque PH. Sugar and other fermentable carbohydrates after hydrolyzed by salivary amylase, provide substrate for the action of oral bacteria, which in turn lower plaque and salivary PH. The resultant action is the beginning of tooth demineralization.⁷ The relation between diet and nutrition and oral health and disease as a synergistic two way street. Diet has a local effect on oral health, primarily on the integrity of the teeth, PH, and composition of the saliva and plaque.⁸ Alteration in nutrient intake, secondary changes in diet intake, absorption, metabolism or excretion can affect the integrity of the teeth, surrounding tissues, and bone as well as the response to wound healing.⁹

Targeted marketing and easy access of harmful foods by children and adolescent through school canteen may result in an increased consumption of these products which in turn may lead to an increase risk of cares and can negatively influence the overall nutrient status and health of the children.¹⁰ The form of Fermentable Carbohydrate directly influence the duration of exposure and retention of the food on teeth. Prolonged oral retention of cariogenic components of food may lead to extended periods of acid production and demineralization and to shortened periods of remineralization. Duration may also be influenced by the frequency and amount of fermentable carbohydrate consumed.¹¹

The available data on the prevalence of dental caries show that Pakistan can be classified as a low caries country, on the positive side 50% children between the ages 12-15 are caries free, but on the negative side 97% of all carious lesions are untreated.⁶ Caries and periodontal disease have affected majority of the Pakistani children, with an increase in DMFT (Decayed/Missing/Filled Teeth) score of a 12 years old from 0.9 in 1999 to 1.38 in 2003.⁷ The purpose of this study was to describe the level of dental caries and to analyze the awareness of oral hygiene by the socio-behavioral factors in age 12-15 years in school going children in district Kohat.

Materials and Methods

In this cross sectional survey, information was collected from 395 school children aged 12-15 years from 8 different schools of district Kohat, Khyber Pakhtunkhawa. Out of these 395 students, 196 students were included from urban and 199 students from rural areas of district Kohat. Simple random sampling technique was used to select 395 students from eight schools of district Kohat. Sample size was

determined using WHO calculator, using expected proportion of 50%, precision of 5% and Z statistic for the level of confidence was 95%. The eight schools were selected from a list of schools provided by education department of District Kohat. Out of these eight schools four were from urban and four from rural area. In each school 50 students were included.

The study sample consisted of children age 12-15 years studying in private and public schools both located in urban and rural areas of district Kohat. A written consent was taken with the help of district education officer Kohat and schools principal from the parents of school children. Clinical examination of children in each school was performed by a single operator (Principal investigator). Examination was conducted using a mirror, a probe, a portable light and cotton pellets for isolation to reveal the presence or absence of dental caries, missing teeth (extracted due to caries) and filled teeth. Caries experience was recorded according to the WHO criteria as decayed, missing, filled teeth (DMFT). All instruments used were sterilized in B-class autoclave. Disposable latex gloves and facemask were used to ensure proper infection control protocols.

A pretested, structured, self-administered questionnaire was used to record the level of knowledge, attitude and practices of the children. The questionnaire was modified to be applicable to the target population. The questionnaire filled by the school children was also translated into Urdu language for convenience. Moreover the principal investigator helped the students who failed to understand some questions. Demographic information, and school name has been recorded in the same questionnaire. The collected data was analyzed using SPSS version16. The mean DMFT score of urban and rural school going children aged 12-15 years were calculated. Frequencies and percentages of school children knowledge, attitude and practice were also calculated.

Results

A total of 395 children aged 12-15 years old were included in the study. Out of total 395 children, 196 children were from urban and 199 were from rural areas. The prevalence of dental caries was 46% with 54% children having a DMFT score of zero. In the 46% children with dental caries, the mean DMFT score was 1.00. The mean DMFT score for school children from urban was 1 and the mean score for children from rural schools of district Kohat was 0.99 (Table 1).The distribution of DMFT score in relation to age is listed in Table 2, whereas the percentage of DMFT by DMFT scores is listed in Table 3. The methods and techniques of cleaning teeth are shown in Table 4.

Table 1: Mean DMFT in relation to location

Location	Mean	N	Std. Deviation
Urban	1.00	196	1.313
Rural	0.99	199	1.454
Total	0.99	395	1.384

Table 2: Mean DMFT in relation to age

Age	Mean	N	Std. Deviation
12 years	1.36	75	1.494
13 years	0.92	140	1.368
14 years	0.95	150	1.370
15 years	0.57	30	1.073
Total	0.99	395	1.384

Table 3: Percentage of DMFT by DMFT scores

Description	Frequency	Percentage (%)
0	219	55.4
1	61	15.4
2	60	15.2
3	25	6.3
4	20	5.1
5	6	1.5
6	4	1.0

The result in Table 4 shows that 95.2% children use toothpaste and toothbrush to clean their teeth and 88.4% children use horizontal strokes to clean their teeth with toothbrush. Among the study population, 86.3% school children stated that they

change their toothbrush once in 3 months while 1% changed their toothbrush when the bristles fray up, while 6% don't have any idea when to change their tooth brush (Table 5).

Table 4: Methods and techniques of cleaning teeth

Methods of cleaning	Frequency (%)	Technique of cleaning	Frequency (%)
Toothbrush/Paste	376 (95.2)	Horizontal Strokes	349(88.4)
Toothbrush/Powder	02 (0.5)	Vertical Strokes	12(3)
Finger/Tooth Powder	16 (4.1)	Both Horizontal/Vertical Strokes	25 (6.3)
Neem Stick	01 (0.3)	Circular Strokes	09 (2.3)

Table 5: Frequency of changing toothbrush (N: 395)

Description	Frequency	Percentage (%)
Once in 3 months	341	86.3
Once in 6 months	20	5.1
Yearly	02	0.5
Bristles Get Frayed up	07	1.8
Don't Know Exactly	25	6.3

Among the study population, 72.2% school children stated that they take snacks once a day (Table 6). The results shows that majority of students were using food items, which are

high in non-milk extrinsic sugar (NMES), which are considered highly cariogenic (Table 7).

Table 6: Frequency of taking snacks (n: 395)

Description	Frequency	Percentage (%)
Once a day	285	72.2
Twice a day	102	25.8
Once a week	06	1.5
Others	02	0.6

Table 7: Types of food consumed (n: 395)

Description	Frequency	Percentage (%)
Nothing	2	0.5
Biscuits	113	28.6
Cakes	75	19
Chocolates	117	29.6
Candies	58	14.7
Halwa	15	3.8
Carbonated Drinks	14	3.5
Any other sweet drinks	1	0.3

Discussion

Dental caries is a major health problem in most industrialized countries and it affects 60-90% of school-aged children. The present study targets at school going children age 12-15 in district Kohat. This study was conducted to estimate the prevalence of dental caries in school going children age 12-15 years and associated factor related to dental caries and to assess the level of the knowledge and practice of children regarding oral hygiene. This study shows a mean DMFT of 0.99 with standard deviation of 1.38. The mean DMFT score for urban is 1 and rural is 0.99. A similar African study done in 2004 8, which shows DMFT score of 0.7 with prevalence significantly higher among urban than rural areas, whereas a study done by AS Bajoma shows a mean DMFT (SD) scores of 0.61(1.50) and 1.26(2.18) were recorded in the 12 and 15 year old respectively.9Wynealso reported mean DMFT in primary school children in Riyadh to be 6.3 (± 35) 10.

At present, the distribution and severity of dental caries varies in different parts of the world and within the same region or country.11 Dental caries experience in children is relatively high in Americas (10) and in the European Region (2.6) whereas the index is lower in most African and Asian Countries (1.7)12. This study show similar scores of dental caries in children age group of 12-15years that is mean DMFT score of 1 compared to other African and Asian countries whereas lower DMFT scores as compared to European countries.13,14,15

World health organization global data has shown an increase in DMFT of 12 years old Pakistani children from 0.9 to 1.38.16 Approximately 70% of the countries in the world have succeeded in achieving the WHO goal of decayed, missing and filled teeth (DMFT) index 3 for 12 year-olds.17 The result of National survey in Brazil, conducted in 2003, showed a significant drop in caries prevalence in 12 year old from 8.3 to 2.8 whereas in French children mean DMFT for 12 years was 2.59. A, recent study conducted in Tehran revealed that the DMFT index in 12-year old students dropped from 1.67 (1993—1994) to 0.77.18 A cross sectional study in Belgium, India has shown a mean DMFT of 2.41 in 13—15 year old school children.19 The prevalence of caries amongst primary school children of Riyadh, Saudi Arabia (2002) is still very high (94.4%).20

In another study Burt et al21 reported a difference in caries increase in children initially aged 11-15 years who consumed an average of 109 or 175 gm sugar/day with only 0.45 approximal carious tooth surfaces over 3 years. The

children with no increase in caries consumed only 8 gm less sugar and 11 gm less fermentable carbohydrates in snacks than did the children who developed 2 approximal lesions, which was 4 times the group average. Burt et al also showed an increase of 0.05-0.13 new caries surfaces per year in children aged 11-15 years for each 20 gmincrease in daily sugar intake. The recognition of sugar as an etiological factor in caries has been with us since centuries. In Eastern culture sweet preparations at home during the festive seasons or otherwise is the common trend. The markets too are flooded with different kinds of sweets. The globalization of Pakistan is adding varieties of sugar containing products into the country. The easy availability of sugar containing food and high consumption of these sweets if continued, the dental caries would become a major public health problem among children.

Frequent intake of carbohydrate leads to higher prevalence of dental caries. Kalsbeek and Verrips22 observed these findings, where 4% of the Dutch children consumed more than 5 sweet snacks per day and the mean DMFT score of their children was also high. Oral hygiene maintenance is also another important variable to keep caries rate low. Oral hygiene procedures consist of personal plaque removal by tooth brushing as well as the professional prophylaxis that often precedes a periodic dental examination leading to caries reduction. Daily personal oral hygiene (tooth brushing and flossing) is recommended in the interest of good hygiene and for the control of gingival disease. It strongly justifies the role of media and advertisements on televisions, Internet and billboards.

Tooth brushing is also required for the self-application of fluoride dentifrice, a proven caries preventive measure. Many authors have suggested that fluoride, even in low concentrations, is necessary in oral fluids to obtain the maximum caries inhibition, and that its continuous concentration enhancement would be valuable.23 Fluoridated dentifrices are a simple and rational form of fluoride use, and in many non-established market economy countries a decline in the caries prevalence was associated with the regular use of these products.24

The European Academy of Pediatric Dentistry strongly endorses that the daily use of fluoride should be a major part of any comprehensive preventive program for the control of dental caries in children. The extensive use of fluoridated toothpastes has probably been one of the major reasons for the dramatic reduction in dental caries recorded over the past twenty years.25 Tooth brushing with fluoridated toothpaste is close to an ideal public health method, in that its use is convenient, inexpensive, culturally approved and

widespread.

A parent's knowledge and positive attitude towards good dental care are very important in the preventive cycle. The prevention of dental caries in children is important to avoid premature loss of the primary teeth and to decrease the risk of future dental caries in the permanent teeth.²⁶ In a analysis of dental visits in American children revealed only 20.4% aged 0- 5 years had a diagnostic and preventive service visit²⁷ whereas in Saudi Arabia,²⁸ it has been reported the majority of parents thought that ages 3 or 6 years were the best ages for the first dental visit. The first dental visit of a child is considered to be one of the major dental caries prevention measures, in order to detect early carious lesions, parent counseling for the prevention like teeth cleaning as soon as the first primary tooth erupts, diet counseling, fluoride exposure.

Global review of oral health conducted by WHO emphasized that despite great improvements in the oral health of population in several countries global oral problem still persists. Oral disease such as dental caries has historically been considered the most important global oral health burden. Parent's practice of oral hygiene as well as their knowledge of oral health is reflected in their children. A parent's knowledge and positive attitude towards good dental care are very important in the preventive cycle.

Although dental caries prevalence and severity in children have dramatically decreased over the last three decades, significant levels of disease persist and are concentrated amongst low socio economic groups.²⁹ The incidence, prevalence, and severity of dental caries in the USA are also highest amongst low-income populations and those racial/ethnic minority groups over represented among the lower, socio economic status.³⁰ Since the study was conducted on children of considerably prudent age group who are inclined to make a positive impression about them, hence the results of the oral health practices could be biased especially the response to the frequency of brushing, and mouth rinsing. Moreover, the study being of cross-sectional design, does not demonstrate the cause-effect relationship between oral hygiene knowledge, attitude and practices among school children and their oral hygiene status.

Conclusion

The knowledge towards dental health and oral hygiene of school going children of district Kohat was satisfactory. However, there is a room for improvement in practice of school children towards dental health and dental service utilization. This could be because of some underlying social factors and an in depth study can further investigate the reasons.

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