



Prevalence of Dental Caries among School Going Children in Mixed Dentition Stage (6 to 15 Years of Age) in the Suburbs Schools of Islamabad, Pakistan

Sahar Shah*, Qurat ul Ain Ayyub, Ahmad Usman Yusuf and Arshad Malik

Department of Health, Health services academy National institute of health Islamabad, Pakistan.

*Corresponding Author: Sahar Shah, Department of Health, Health services academy National institute of health Islamabad, Pakistan.

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Abstract

Background: Dental Caries is a common infectious disease of tooth with its high prevalence rate among children and it still continues to be a major public health concern around the globe.

Aims and Objectives: To measure the prevalence of dental caries and determine the quality of oral hygiene maintenance with special reference to treatment requirements among school going children.

Materials and Methods: Total n = 937 school going children from age 6 to 15 were screened. All the subjects have been randomly selected through school visits. A team of dental surgeons performed intraoral examination in participants with special focus on the DMFT Index showing the number of teeth that have undergone decay, extractions or restorations as a result of dental caries. Their oral hygiene has been observed and treatment needs have been recorded, if any.

Results: It has been found that out of total n = 937 subjects who have been included in the present study and screened for their DMFT status n = 656 subjects were males, 65% while n = 281 were females (35%). Age range was from 6 years to 15 years with mean age ranging from 10.53 ± 2.844 . These subjects have been randomly selected through school visits. Mean Decayed missing filled teeth index (DMFT) calculated was 0.51 ± 0.902 which indicates low to moderate caries prevalence.

Conclusion: Prevalence of dental caries was found to be ranging between low to moderate among mixed dentition stage children and the trend was even more common among the age group 9 to 11 years. Strict preventive programs should be implemented.

Keywords: Dental Caries; Dentition Stage; Decayed Missing Filled Teeth Index (DMFT)

Introduction

According to World Health Organization (WHO), promotion of dental health is a cost effective approach for decreasing oral disease burden and maintaining status of optimum oral health and improved quality of life [1]. The significance of association of oral health to general health can be realized from the fact that how compromised oral hygiene leads to causing considerable pain as in the case of toothache due to dental caries and affecting

the way we speak and eat leading to disturbed quality of life [2]. In 1883, W.D. Miller found the role of involvement of bacteria in development of dental caries. Though centuries have passed and with all the advancements done in the field of dentistry, still we are yet to achieve a marked reduction in prevention of dental caries and especially among children. According to Shafer, dental caries is a pathological disease of calcified tissues of teeth which causes destruction of organic substance and demineralization of inorganic portion of the tooth, which often results in cavitation [3].

Dental Caries is a common infectious disease of tooth with its high prevalence rate among children and it still continues to be a major public health concern around the globe [4]. The data available shows there is to some extent decrease in prevalence of dental caries in developed countries but in developing countries, prevalence of dental caries is still very high [5]. According to reports of Centres for Disease Control and Prevention (CDC), almost 41 percent of children have decay in their deciduous teeth and untreated cavities in children are reported to be more than 19 percent [6]. Decrease in prevalence of dental caries in developed countries has been associated with more effective dietary approach to sugar consumption, better oral hygiene practices and more proactive healthcare policies with main focus on preventive measures. In developing countries, the main reason for increase in dental caries is due to flaws in health care system with main focus on curative care rather than being on preventive side and failure to practical implement oral health promotion and preventive projects at grass root level. There are multiple causes which can lead to dental caries and its prevalence among population is influenced by number of risk factors such as dietary patterns, age, sex, tooth brushing technique and ethnic group [7]. The role of diet has a strong association in relation to development and prevalence of dental caries and dental caries activity is markedly influence by nature of sugar and frequency of intake [8]. Each year, in excess of more than 49 million hours are wasted of school students around the world, because of oral issues [9] so it is important to emphasize a regular checkup to a dentist.

Many research studies have been done in relation to prevalence, aetiology and treatment of dental caries in developed countries but data related to prevalence of dental caries among Pakistani children is very limited and literature which is available shows increase incidence of dental caries with time among Pakistani children [4].

Aim of the Study

The main aim of this study is to determine prevalence of dental caries and dmft score among school going children living in suburb of Islamabad city and having age group of 4 - 15 years of age. This data would be beneficial in implementing oral health intervention programmes in schools for preventing dental caries among children living in suburb of Islamabad city.

Materials and Methods

The study was carried out on a total number of 937 school going children from 6 to 15 years with mean age (9.6 ± 3.592) in 3 schools located in the suburbs area of the capital city of Pakistan.

The study was approved by Ethics Committee of HBS Dental College, Islamabad. Prior permissions and consents were obtained from school authorities, parents, and teachers.

This study was completed in a span of 12 months, by six examiners. The examiners who have been dental surgeons were carefully trained by the principal investigators before screening the subjects. The school children were examined individually within the school premises by all the six examiners, simultaneously. The principal investigator also accompanied and closely monitored the proceedings. Examination was done on a simple wooden chair using plane mouth mirrors, tongue depressors and community periodontal index probe. The examination was done under natural day light and torch light using WHO criteria for recording the DMFT Index. The children were examined for the presence of decay, missing and filled teeth (dmft) index was used to record the dentition status. Data was recorded and children were given kits containing a tooth brush and a tooth paste as a gift by the principal investigator. Later tooth brushing technique was also demonstrated using community models. The parents were informed about the dental treatment requirements of their children by sending a copy of the individual's examination form to home.

Study area and sample size calculation technique

Study area selected for this study was school children studying in suburbs of Islamabad, the reason been was to get the sample for both rural and urban setting. Total 937 students were included in the study in 3 different schools. Sample was calculated according to the strength of each school. Data was collected and recorded by a team of dentist from HBS dental college.

Group 1(6 - 8) n = 286, group 2 (9 - 11) n = 246, group 3 12 - 15 (n = 405).

Data collection technique and Dmft

WHO survey tool for dental caries was used as a questionnaire. Standardized score for measuring dmft index is as following:

- The WHO deft/DMFT index calculation criteria were categorized as very low in the value Of 0.0-1.1; low in the value of 1.2 - 2.6; moderate In the value of 2.7 - 4.4; high in the value of 4.5 - 6.5 and very high in the value above 6.6.

Inclusion exclusion criteria for study sample selection

Age group selected for this study was those having mixed dentition without any gender specification. Students who does not lie in systematic sampling were excluded from record taking otherwise examination was done for them.

Results

Data was entered on an Excel spreadsheet and was cleaned, coded, and uploaded to SPSS 22.0 for analysis. As a result of the screening process it has been found that n = 297 (26.03%) of the school going children had carious maxillary teeth while n = 358 (31.37%) had carious decay in their mandibular teeth mostly 1st permanent molars. The most prevalent type of carious decay found was, pit and fissure caries. Previous tooth extractions have also been recorded and it was found that n = 31 (2.72%) had upper teeth missing due to extractions while n = 17 (1.49%) had undergone tooth extractions in their lower arch. n = 11 (0.96%) restored teeth have been found in the maxilla while n = 16 (1.40%) tooth restorations have been found in the mandibular teeth. The oral hygiene status revealed n = 565 (49.60%) of the individuals with good oral hygiene while n = 217 (19.02%) had moderate and n = 355 (31.11%) had a poor oral hygiene. About n = 483 (42.33%) required some sort of corrective treatment while n = 657 (57.58%) had sound dentition in all respects and did not require any further treatment.

Treatment need suggested was as following

No need of treatment n = 458 (48.9%), improvement oral hygiene n = 75 (8%), improvement of Oral hygiene with filling recommended to n = 247 (26.4%), Oral hygiene with filling and extraction n = 116 (12.4%), those who were advised of scaling was n = 16 (1.6%) and recommended Orthodontic treatment n = 26 (2.8%).

Descriptive statistics

Total 937 children were surveyed for Dmft prevalence by using WHO screening forms (attached in annexure) for dental caries in three schools of Islamabad. 627 male and 337 females were included in the study which were selected randomly by Systematic random sampling, every 3rd student was selected for sample recording, examination of all students was done but records are kept for those who were selected through randomization. Total sample selected included 280 students from Allama Iqbal School with mean age 13 and College, 435 were selected with mean age 9 from the Muslim Hands School of Excellence, 222 were selected with mean age 7 from Pak Turk School, Allama Iqbal School and College n = 280, PakTurkschool n = 222, Muslim Hands School of Excellence = 435.

Inferential statistics: The following table shows the variation of mean Dmft among different age groups. Total Dmft recorded is 0.51 ± 0.902 which indicates low to moderate Caries prevalence in overall sample.

	N	Minimum	Maximum	Mean	Std. Deviation
Decayed	937	.00	6.00	.4123	.89001
Missing	937	.00	4.00	.0491	.32357
Filled	937	.00	3.00	.0342	.27103
Total dmft	937	.00	6.00	0.5	1.015

Table 1: Showing Descriptive Statistics for mean DMFT.

	Frequency	Percent
No need of treatment	458	48.9
Improvement oral hygiene	75	8.0
Oral hygiene with filling	247	26.4
Oral hygiene with filling and extraction	116	12.4
Scaling	15	1.6
Orthodontic treatment	26	2.8
Total	937	100.0

Table 2: Treatment need.

	Frequency	Percent
Good	461	49.2
Moderate	187	20.0
Poor	289	30.8
Total	937	100.0

Table 3: Showing oral hygiene condition.

Discussion

In Pakistan there is scarce data on oral health status of children attending schools, no national health survey data has been conducted on oral health status of school going children, although this study does not represent the whole sample of school children in Pakistan but it will give an insight into the caries prevalence oral health status and dietary habits of children in suburbs school children.

Individual mean Dmft for 3 categorized group based on age were assessed group 1(6 to 8) showed 1.73 mean dmft score with S.D of Group 2 ranging from 9 to 11 years of age showed 1.99 mean dmft score with SD of Group 3 dmft score was 1.46 with standard deviation.

Age		Decayed	Missing	Filled	Total individual mean dmft	Total mean Dmft for age group	
Group 1	6	Mean	.41	.05	.02	0.48	1.73
		N	95				
		Std. D	.928	0.305	0.205		
	7	Mean	0.00	0.03	0.60	0.63	
		N	80				
		Std.D	1.00	.000	.224		
8	Mean	0.05	0.04	0.53	0.62		
	N	111					
	Std. D	.952	.297	.231			
Group	9	Mean	.05	0.02	.63	0.70	1.99
		N	96				
		Std. D	1.029	.303	.204		
	10	Mean	0.13	0.03	.65	0.81	
		N	77				
		Std. D	1.061	0.593	.228		
11	Mean	.03	0.07	.38	0.48		
	N	73	73	73			
	Std. D	.937	.164	.419			
Group 3	12	Mean	.02	0.01	0.36	0.39	1.46
		N	87				
		Std. D	.862	.214	.107		
	13	Mean	0.04	0.04	0.32	0.40	
		N	138				
		Std. D	.792	.293	.306		
	14	Mean	0.03	0.07	0.21	0.31	
		N	123				
		Std. D	.643	.178	.379		
15	Mean	0.05	0.07	0.26	0.36		
	N	57					
	Std. D	.745	.397	.371			
Total	Mean	.05	.04	.43	0.52		
	N	937					
	Std. D	.902	.301	.281			

Table 4: Individual Dmft index for different age group in mixed dentition.

Experience of oral caries was ranging from moderate to high in different age groups of school children reporting 30 % of having poor oral hygiene and mean prevalence of decayed teeth was

0.432 ± 0.902. A study conducted in Nepal among 9 - 11 years old schoolchildren had reported that 45% of children suffered from tooth problems with 31% of having poor oral hygiene and dental caries problem [10].

Another study results revealed that Only 56% school children brushed their teeth daily. In this current study 53.5% n = 501 reported of brushing daily and n = 436 (46.5%) of not brushing at all. Brushing twice daily with fluoridated toothpaste is a recommended practice for a good Oral health [11].

The frequency of consuming sugar rich foods was very high in this study about n = 658 (70.2%) reported of consuming sugary rich foods on daily basis only 279 (29.8) reported of not consuming sugary diets during school daily routine and carbonated drinks consumption was 384 (41%).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	553	59.0	59.0	59.0
	Yes	384	41.0	41.0	100.0
	Total	937	100.0	100.0	

Table 5: Showing Soft drinks consumption.

A local Study conducted in Karachi in 6 to 12 years of schools going children showed similar mean DMFT, which shows the results Among mixed dentition prevalence was found to be more than half (n = 450, 63%) with mean DMFT score of (0.97 ± 1.97) which relates to the present study with Mean Dmft of 0.51 ± 0.902 in school going children [12].

Intersectoral collaboration for educating children with education and govern sectors and public policy departments will have profound effect on the improvement of oral health on community level and school provides ideal setting for educating and improving oral hygiene of at an early age .only education can never be the sole component for improving the behaviour of children but practice and vigilance of the parents will make it possible to change the behaviour and developing lifelong skills of children in improving oral health.

Conclusion

Prevalence of dental caries was found low to moderate among mixed dentition stage and the trend was even more common among the age group 9 to 11 years. Strict preventive programs should be implemented with inter sectoral collaboration. Further research with larger sample size is required.

Recommendation

- The study can be conducted on the large scale sample to validate and for better generalization of the findings.
- Training programs for teacher should be conducted.
- Regular Dental check-up may be conducted for school children especially in government sector.
- School syllabus may include topic related to Dental hygiene.
- Children should be educated regarding the dental hygiene in each school of rural area.

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Conflicts of Interest

No potential conflict of interest declared.

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