

ORAL HYGIENE STATUS OF PRIVATE AND PUBLIC SCHOOL CHILDREN FROM NINE TOWNS OF KARACHI CITY

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ABSTRACT

The object of study was to appraise oral hygiene status of school-children of 6-years and 12-years in both public and private schools selected from nine different towns of Karachi city.

An observational type of analytical cross sectional study of 1600 school-children, belonging 6 years and 12 years of age, were conducted among nine different towns of Karachi city. Sampling selection was based on cluster sampling technique. At the first stage, nine towns out of total eighteen towns were selected randomly. In the next stage, from each selected town one private and one public school were identified randomly. Selected sample of school-children were examined for plaque and gingivitis by using Loe and Silness plaque and gingival index.

The overall plaque index score of the sample was found to be more than three fourth (n=1373, 85.8%) with the mean value of 1.18 (± 0.73), indicating fair levels of plaque presence among school-children. Age wise plaque index scores were found to be statistically significant but gender wise statistically non-significant results were found ($p \geq 0.53$). The overall gingival index scores of school-children was found to be more than one fourth (n=445, 27.8%) with mean value of 0.43 (± 0.77), reporting mild gingivitis among the study sample. Both age and gender wise mean gingival index was found to be statistically significant. Moreover, oral hygiene status (plaque and gingival index) were reported statistically significant among private and public school- children.

This study suggests that more than half of the school-children had presence of dental plaque, whereas more than one third of them had mild gingivitis. This highlights the need for an unmet dental care services as well as community oriented health education and promotion in order to induce primary and primordial mode of prevention among school going children.

Key Words: Oral hygiene status, Private and public school-children, nine towns, dental plaque, gingivitis.

INTRODUCTION

Today millions of children are suffering from dental diseases because they cannot obtain timely educational and treatment services.¹ Oral health education and promotion is considered as a priority for school-children since they are at a high risk for dental diseases predominantly dental caries and gingival diseases; at the age of mixed dentition.^{2,3} Both gingivitis and dental caries are caused by activity of bacterial plaque.⁴ Initially it results in gingivitis and if it is remained untreated then leads to periodontal diseases and ultimately tooth loss.⁵

Although dental plaque is main culprit, but some other secondary factors like hormonal imbalances, diabetic mellitus, poor nutritional status, smoking and stress progresses gingivitis in to periodontitis, moreover besides these factors human behavior also play a relevant role.⁶ Therefore, regular tooth brushing and appropriate use of fluoridated toothpaste is essential in eliminating dental plaque and maintaining oral hygiene.⁷

It has been documented that poor oral hygiene and plaque play important role in causing gingivitis.⁸ Several epidemiological studies from developing countries had revealed that oral hygiene of primary school-children found to be poor along with higher prevalence of plaque and gingivitis representing absence of adequate self-oral hygiene practices among them.⁹⁻¹¹ Furthermore, some studies had also reported relationship between poor oral hygiene with dental caries and gingivitis among preschool-children as well.^{12,13} at present one single study related to oral hygiene status had reported from

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Hariapur, Pakistan had showed an overall fair levels of oral hygiene status among school-children with no significant difference among public and private schools.⁷

Above mentioned statistics had revealed that almost majority of school-children belonging to developing countries are burdened by plaque related gingival diseases and dental caries. Furthermore, these conditions are provoked by poverty associated with poor quality of living conditions, neglected health education as well as unavailability of preventive strategies along with need of government funded policies for planning community and school based oral health education programs besides an oral health promoting team force.¹⁴ The data related to oral hygiene status of school-children is vital and helpful in planning and proposing preventive services and treatment needs respectively. Thus, in developing countries programs related to primordial as well as primary mode of prevention for school-children are of main concerned and needed utmost.

As there is scarcity of data related to oral hygiene status including plaque and gingival index among school children belonging to age 6-years and 12-years, as well as last oral health survey that was held in 2004, only reported oral hygiene status of 12 years old and above. So there was an utmost need to perform this epidemiological study to identify problems related to oral hygiene status among school children belong to 6 and 12 years old. In order to induce primordial and primary mode of prevention along with community oriented oral health awareness, education and outreach programs among these school-children, which were taken from nine out of eighteen towns of Karachi city. The objective was to appraise oral hygiene status of school-children of 6-years and 12-years in both public and private schools selected from nine different towns of Karachi city.

METHODOLOGY

It was an observational type of analytical cross sectional study, conducted in Karachi city, with in the period of eighteen months. Sample selection was based on inclusion criteria that included all school children of 6 and 12 years of age, both male and females school children with primary and mixed dentition whereas school children with oro-dental problems, mental or physical handicapped or those who did not return their consent forms were excluded from the study.

Sample size was calculated by using a computer software program Epi-info 6, by taking the reference values for class 1 and class 6 school-children, respectively,² by keeping confidence interval at 95%, power of test 80% and margin of error at 5%. Hence, the total of 1328 sample size (n) attained, adding to it a 20% non-response rate a total sample of 1593.6 was achieved.

Therefore, the sample size of 1593.6 was rounded to 1600 and equivalent quantity of school-children was examined in this study.

Two stage cluster sampling technique was utilized for selection of sample. In first step we have selected nine towns out of eighteen towns randomly. In the next step, from each selected town we identified randomly one private and one public school. The selected towns were Sadler, Jamshed, Gulshan Iqbal, Liaquatabad, North Nazimabad, Kaemari, Malir and Shah Faisal. Population of interest was sample of six and twelve year old school children, for the purpose of dental examination concerning their plaque and gingival status.

After selecting the schools, permission to conduct the study was taken from school's Principal, and then consent forms were distributed among class teachers, so that they would forward it to the parents of school-children to obtain their acquiescence about their child's participation as the part of dental examination. Parents of all selected subjects were not informed before clinical examination in order to minimize the potential

TABLE 1: DISTRIBUTION OF ORAL HYGIENE STATUS (PLAQUE & GINGIVAL INDEX) AMONG SCHOOL-CHILDREN

Variable	Frequency (n=1600)	Percent-age	Mean ± SD
Plaque Index Score	1373	85.8	1.18± 0.73
Age Wise Distribution of Plaque Index Score			
6-Year (886 total)	692	78.1	0.87±0.54
12-Year (714 total)	681	95.4	1.56±0.76
Gender Wise Distribution of Plaque Index Score			
Boys (850 total)	752	88.5	1.17±0.69
Girls (750 total)	621	82.8	1.19±0.78
Gingival Index Score	445	27.8	0.43±0.77
Age Wise Distribution of Gingival Index Score			
6-Year (886 total)	96	10.9	0.11±0.33
12-Year (714 total)	349	48.9	0.83±0.96
Gender Wise Distribution of Plaque Index Score			
Boys (850 total)	197	22.2	0.37±0.75
Girls (750 total)	248	33.1	0.50±0.78

TABLE 2: COMPARISON AMONG PLAQUE AND GINGIVAL INDEX ACCORDING TO AGE AND GENDER OF SCHOOL-CHILDREN

Variables	Mean difference	Mean ±SD	95% CI of difference		P-value
			Lower limit	Upper limit	
Age (6 years vs. 12 years)					
Mean gingival index	-0.720	0.11 (±0.33) 0.83(±0.96)	-0.788	-0.652	0.00
Mean plaque index	-0.687	0.87(±0.54) 1.56(±0.76)	-0.751	-0.622	0.00
Gender (boys vs. girls)					
Mean gingival index	-0.13	0.37(±0.75) 0.50(±0.78)	-0.206	-0.055	0.001
Mean plaque index	-0.022	1.17(±0.69) 1.19(±0.78)	-0.095	-0.049	0.535*

(Independent sample T test) (*Statistically non significant)

TABLE 3: COMPARISON AMONG PLAQUE INDEX AND GINGIVAL INDEX (PRIVATE VS. PUBLIC SCHOOL-CHILDREN)

Variables	Mean difference	Mean ±SD	95% CI of difference		P-value
			Lower limit	Upper limit	
Plaque index	-0.60	1.03 (±0.70) 1.63(±0.64)	-0.6846	-0.5286	0.00*
Gingival index	-0.93	0.20(±0.49) 1.13(±1.00)	-1.0122	-0.8627	0.00

(Independent sample T test) (*Statistically significant)

bias (e.g. by extra tooth brushing). The children were examined by a single dentist with over three years of clinical experience, with in class room, with the child seated on an ordinary chair. The oral hygiene status was recorded as excellent, good, fair or poor according to the Plaque Index by Silness and Loe 1964 via measuring the thickness of plaque on the gingival one third of teeth.¹⁵ Furthermore, the gingival status was evaluated on six selected index teeth according to the gingival index of Silness and Loe 1963.¹⁵ Sufficient sets of sterilized examination instruments were arranged for each day before use in oral cavity to minimize and avoid cross infection.

Institutional Review Board of Dow University of Health Sciences was asked to provide ethical approval for the study. Moreover, a request letter was provided to the Principals of selected schools for data collection procedures as well as consent from participant’s parents were also obtained.

The data were entered and managed by using Statistical Package for Social Sciences (SPSS) Version 17. Descriptive analysis of the data includes frequencies, percentages and mean of school-children's plaque and

gingival status. Then comparisons among oral hygiene status of private and public school-children as well as among age and gender of school children were performed by using independent sample t test. Level of significance at p=0.05.

RESULTS

A total of 1600 school-children belonging to 6-years and 12-years of age, with the mean age of 6.0 and 12.0 years respectively, were examined for this study. Fifty five percent (n=886) were 6-years of age and 44.6% (n=714) were 12-years of age. Gender distribution among 6 years old school-children; 56.2% (n=498) were boys and 43.8% (n=388) were girls and among 12 years old school-children; 49.3% (n=352) were boys and 50.7% (n=362) were girls.

DISCUSSION

Maintenance of oral hygiene is known to be an integral component of the oral health. As poor oral hygiene leads to collection of dental plaque, which in turn can cause gingivitis that is described as presence of gingival inflammation without detectable loss of bone or clinical attachment and is common among children.^{15,16}

The findings of plaque among school-children were more than three fourth with the mean of 1.18 (± 0.73), showed fair levels of plaque among selected study sample. The age wise mean plaque index score was 0.87 for the 6-year-old school-children and 1.56 for the 12-year-old children which were found to be statistically significant. These findings were in accordance with the study.¹⁷ However, similar findings with higher or lower statistics had also reported from other parts of the world.^{18,19} These disparities may be endorsed due to the difference in methodologies or age group of selected subjects or may be due to difference among oral health practices, cultural background and dietary habits. The gender wise distribution of mean plaque index score in current study was found to be 1.17 (± 0.69) in boys and 1.19 (± 0.75) in girls and was statistically non-significant. These statistics were in accordance with study reported previously.²⁰ However, studies²¹ failed to agree with current findings. The reason of slightly lesser mean of plaque index among girls may be due to the fact that boys have more access to sweets and confectionary stuff.

The overall sample of school-children were suffering from mild gingivitis, similar results was reported by study.²² However, these findings were not in agreement with the studies²³⁻²⁵ reported which may be due to poor oral health awareness and lack of oral hygiene practices among school children of same age groups in our regions. Furthermore, age wise gingival index score of 6-years was less than one fourth and 12 years old was half and found to be statistically significant demonstrating increase in the prevalence of gingivitis among school-children as age advances. Similar findings were reported by studies.²⁶⁻²⁸ The reasons of increasing gingival inflammation as age advances may be due to mixed dentition phase, improper or unsupervised tooth brushing, shedding of primary teeth and malocclusions which contributes towards accumulation of plaque resulting in gingivitis among children.^{10,27} Along with hormonal changes near puberty that increases permeability of vessels is significantly associated with gingivitis in growing age.²⁹ Gender wise gingival index scores among girls were found to be slightly higher than their counterparts and were statistically significant. These findings were in accordance with the studies reported globally.^{11, 23,27,30,31} The difference may be due to related to pubertal changes and lack of provision of oral health facilities to girls as compare to boys in rural parts. Studies^{32,33} reported but did not reveal significant gender difference among their selected sample.

Furthermore, mean plaque and gingival index were also significantly different amongst school-children belonging to public and private setup reporting higher levels of plaque and severe gingivitis among public school-children. However these findings are not in agree-

ment with the study reported from Haripur Pakistan. These aforementioned statistics may be highlighting the carelessness of performing oral hygiene practices and lack of disseminating oral health education along with its promotion among school children from both setups.

CONCLUSION

This study suggests that an overall mild level of dental plaque and presence of mild gingivitis were also seen among more than three fourth and more than one fourth respectively with significant differences among private and public school-children. Thus high lightening the need for awareness about primordial mode of prevention as well as provision of primary mode of prevention; that will result in oral disease free school-children population in future. It is also recommended that a dental clinic with the trained doctor and/or dental hygienist with in school premises should be made mandatory by school management in order to appraise the oral health status and self-oral hygiene practices among school-children.

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