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Original Research Article

Evaluation of Oral Health Status among 29 Rural Schools of a Region in Central India

Dr. Muqthadir Siddiqui Mohammad Abdul[1], Dr. Heena Tiwari[2*], Dr. B. Harshitha[3], Dr. Pranoti Hiralkar[4], Dr. Kaushal Charan Pahari[5], Dr. Siva Sai Kumar Gandham[6]

[1]Department of Paediatric Dentistry, Ministry of Health, King Khaled Hospital, Riyadh
[2]BDS, PGDHHM, Government Dental Surgeon, CHC Makdi, Kondagaon, Chhattisgarh, India
[3]MDS, Assistant Professor, Department of Periodontics, Sri Sai College of Dental Surgery, Vikarabad, India
[4]Post Graduate Student, Department of Public Health Dentistry, Sibar Institute of Dental Sciences, Takkellapadu, Guntur, NTRUHS, Vijayawada, Andhra Pradesh, India
[5]PG Student, OMFS, Surendra Dental College & RI, Sriganganagar, Rajasthan, India
[6]Master's in Public Health, Tulane University, 1440 Canal Street, New Orleans, Louisiana

***Corresponding author:** Dr. Heena Tiwari
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Abstract

Background: It is a known universal fact that oral health is general health. The awareness among the population should be given form the stages of development and so school going children are the best to evaluate oral health status. This will help us to understand the socioeconomic and health status by which we can cure and also give preventive measures to them and their family. ***Material & Methods:*** The study was carried out to assess oral health status of the students of 29 Rural School in Central India. The epidemiological study was conducted between Jan 2015 to Nov 2016. Epidemiological assessment was conducted on 1106 children of age group 5-15 years to evaluate the decay missed filled index, oral hygiene index and fluorosis index. ***Results:*** 1035 (93.86 %) of the study participants were caries free (dmft/DMFT= 0) and 71 (6.14%) had caries (dmft/DMFT>0). The mean def (t) among boys (3.26+3.115) was high as compared to girls (2.41+2.697). The mean DMF (T) score of girls (0.95+1.697) was higher as compared to boys (0.79+1.352). Percentage of school children with good oral hygiene was higher among the 9-10 years school children (84.5%) compared to 14-15 years school children. Among the participants, out of 1106, in 89 children (8.1%) fluorosis was present and 1017 children (91.9%) fluorosis was absent. ***Conclusion:*** Our study suggested that the prevalence of dental caries was more in private school students, but the resultant was statistically insignificant. The mean DMFT score of 9-10 years school children was the lowest whereas the DMFT score of 14-15 years was the highest and was statistically significant. Oral hygiene among government school students and private school students were comparable and statistically insignificant. Percentage of school children, who had dental fluorosis, was high among government school as compared to private school.

Keywords: Caries, Fluorosis, Oral Hygiene, School, Survey.

INTRODUCTION

Oral health has been always an essential demarcation of a healthy Individual. American Dietetic Association 1986 have stated that an efficient chewing of food helps in maintaining the essential nutrients which acts as the building blocks of the body [1]. The burden of Dental Caries and Periodontal disease is vast among the population as per the WHO [2]. If dental caries and periodontal health issues are not addressed at the right time among children it results in an implication resulting in serious complications and they might need the skip school because of Pain [3]. Along with the prevalence of dental caries and periodontal disease, Dental fluorosis is another common developmental anomaly caused by excessive fluoride intake during the development of teeth [4]. Howsoever literature explains that Fluoride consumption within the recommended dosage is the major artillery in prevention of dental caries [3], is prevalent among the various developing nations across the globe including India, But is a two sided sword that is if not used judicially, excessive systemic consumption may lead to chronic fluoride toxicity, which manifest as dental and skeletal fluorosis [3].

Aim of the study

This epidemiological study was premeditated as very limited no of studies have been conducted among the school going rural population of central

India. This study was undertaken with the following aims - To assess the prevalence of dental caries, oral hygiene, dental fluorosis among the school going children of rural population in central India.

MATERIALS AND METHODS

The study was carried out to assess oral health status of the students of 29 Rural School in Central India. The epidemiological study was conducted between Jan 2015 to Nov 2016. The study population consisted of children aged 5 to 15 years who were attending the school in Central India and the schools were selected randomly. The age groups screened were the primary dentition, mixed dentition and permanent dentition group, except the third molar and the early status of dental caries that could not be diagnosed positively were excluded from the study. Informed written consent was obtained from school authorities and parents of participating children. For statistical analysis Chi square test and Student – t test was used using SPSS Software 13.0

RESULTS

Epidemiological assessment was conducted on 1106 children of age group 5-15 years. According to age, 252 (22.78%) were of 5-6-year-old, 439 (39.69%) were of 9-10-year-old and 415 (37.53%) of 14-15-year-old. Out of the study population, 476 (43.04%) were in government school and 630 (56.96%) in semi government school and if we see on the basis of gender total no. girls were 570(51.53%) and total no. of boys were 536(48.46%) (Table-1). 1035 (93.86 %) of the study participants were caries free (dmft/DMFT= 0) and 71 (6.14%) had caries (dmft/DMFT>0). When we compared the status of the students of the government (5.8%) and private schools (7.1%) the prevalence of dental caries was more in private school students, but the resultant was statistically insignificant (p-value=0.204) (Table-2). Percentage of school children with dental caries was higher among boys (66.7%) than in girls (63.5%), which was not statistically significant (p-value=0.193). Among the 5-6 years out of 252, 13 (5.1%) had dental caries, in 9-10 years, out of 439, 42 (9.5%) had dental caries and in 14 - 15 years, out of 415, 16(38.5 %) had dental caries. Percentage of school children who had dental caries was high in 9-10 years (9.5 %) which was statistically insignificant (Table-3). The mean def (t) among boys (3.26+3.115) was high as compared to girls (2.41+2.697). The mean DMF (T) score of girls (0.95+1.697) was higher as compared to boys (0.79+1.352). The mean def (t) of 5-6 years (3.36+3.511) was higher as compared to 9-10 years (2.55+2.497) school children (Table-4). The mean DMFT score of 9-10 years school children was the lowest (0.45+0.996) whereas the DMFT score of 14-15 years was the highest (1.34+1.832) and was statistically significant (p-value<0.001) (Table-5).

Percentage of school children with good oral hygiene was higher among the 9-10 years school children (84.5%) compared to 14-15 years school children (76.8%) (Table-6). Howsoever oral hygiene among government school students and private school students were comparable and statistically insignificant. Among the participants, out of 1106, in 89 children (8.1%) fluorosis was present and 1017 children (91.9%) fluorosis was absent (Table-6). Percentage of school children, who had dental fluorosis, was high among government school as compared to private school.

Table-1: Distribution of study participants according to age and gender. n=Number, %=Percentage

Variables			Caries Status		total
			Caries Free	Dental Caries	
School	Private	Frequency	37	579	630
		%	5.8%	94.2%	56.96%
	Government	Frequency	34	280	476
		%	7.1%	92.9%	43.04%
Total		Frequency	71	1035	1106
		%	6.14%	93.86%	100.0%

Table-2: Comparison of study participants in regard to caries status and schools

Variables					
	Caries Status		14-15 (n =415)	boys (n =536)	Girls (n =570)
total			41.41% (106)	25.54% (291)	62.7% (357)
	Caries Free	Dental Caries	31.84% (309)	74.46% (245)	37.3% (213)
			37.53% (505)	48.46% (536)	51.53%(570)

Table-3: Comparison of study participants with mean d (t), e (t), f (t) and def

Variables	mean±SD		p-value
	5-6 years (n=252)	9-10 years (n=439)	
def (t)	3.36 ± 3.511	2.55±2.497	p<0.001
d (t)	3.22±3.408	2.42±2.434	0.25
e (t)	0.08 ± 0.399	0.11±0.475	0.075
f (t)	0.06±0.378	0.02±0.169	p<0.001

Table-4: Comparison of study participants with mean D (T), M (T), F (T) and DMF (T) according to age

Variables	mean+SD		p-value
	9-10 years (n=439)	14-15 years (n=415)	
DMF (T)	0.45±0.996	1.34±1.832	p<0.001
D (T)	0.45±1.022	1.27±1.792	p<0.001
M (T)	0.01+0.072	0.01+0.133	p=1
F (T)	0.00±0.058	0.07±0.359	p<0.001

Table-5: Comparison of study participants with oral hygiene status and age

OHIS		mean±SD	
		9-10 years (n=439)	14-15 years (n=415)
Good	Frequency	371	319
	%	84.5	76.8
Fair	Frequency	59	94
	%	13.4	22.6
Poor	Frequency	9	2
	%	2.1	0.6

Table-6: Comparison of study participants with dental fluorosis and school. p<0.001 – which is insignificant

School	Dental Fluorosis	
	Present	Absent
Government	42(9.7%)	432(90.3%)
Private	47(7.4%)	583(92.6%)
Total(n = 1106)	89(8.1%)	1017(91.9%)

DISCUSSION

Dental caries defined as an irreversible microbial disease of the teeth, characterized by demineralization of the inorganic component followed by the destruction of the organic substance of the tooth resulting into the cavitation. The prevalence of dental caries has declined worldwide due to various measures taken by the government and improved literacy level among the rural population [6]. Dental caries is the most prevalent of the oral disease in childhood that is from the first through the twelfth year of life. The primary teeth erupt performs its functional and exfoliates, and the permanent teeth, exclusive of third molars, are formed and erupt into a functional pattern [6]. Various investigators have commented that, that at one year of age approximately 5% of the children exhibit dental caries and as the age advances the percent increases and at around 2 years it is up to 10 %. The trend continues in the same fashion and is evident in school going children [7]. When compared the prevalence of dental caries in developed nation and developing nation it is well documented in literature that the developing countries have more in no as compared to developed nations. [8]. Dental fluorosis is manifested during the development of the teeth and once the developmental stage is over the higher concentration of fluoride cannot affect and exhibit dental fluorosis [9]. The present study was designed to assess the prevalence of dental caries, oral hygiene and dental fluorosis among 5-15-year-old school going children in Central India. Moses J *et al*., and Batwala V *et al*., [9, 10] give the criteria for the assessment of the school children among the age groups: 5-6, 9-10 and 14-15 and were selected to evaluate the primary dentition, mixed dentition and permanent dentition except the third molar. The results that can be inferred from the present study shows 71(6.14%) students had dental caries and 1035 school going students were caries free which suggest that the prevalence of dental caries is less among the study population and could be a direct result of increased awareness among the masses about these prevalent oral diseases. The dental caries status among government school children and private school going children was not significant (p>0.001). Though our finding did not match with the other similar studies conducted among the Indian population, Sukhbhogi JR et al., found that dental caries was more among government school children [11]. Similar study done by Shivananda G S *et al*., showed more caries prevalence in students of government school in Shimoga District Population [12]. In the present study, 9-10 years age group shows higher prevalence of caries than the age group of 14-15 years which agrees with study done by Ndanu TA *et al*., [13]. A 5-6 years age group had high caries prevalence than 14–15 years age group which is similar to Batwala V *et al*., results [10]. In the present study, the mean def (t) score was higher in boys as compared to girls (p<0.001) similar results observed in Kalaskar RR *et al*., study [14]. The mean DMF (T) score was high in girls as compared to boys but it was not statically significant. This was similar to studies by Babu MSM *et al*., and Poornima P *et al*., [11, 15]. Girls had a significantly higher mean DMFT value than boys. This may be due to the fact that teeth erupt earlier in girls than boys which lead to prolonged exposure of the teeth to the oral environment in females [16]. Oral hygiene is a clear indicator of oral health. Present study showed that in study population

maximum students had good oral hygiene and only 1.35 % students had poor oral hygiene our study had a similar result that of Sharma S *et al*., [17]; there was not much significant difference between the government and private school students There was no significant difference between government and private school children in oral hygiene status. Dissimilarity was observed when compared to results of Ndanu TA *et al*., [18], who observed poorer oral hygiene students of the private school when compared to government school students. Among 9-10 years age group, about 84.5% had good, 13.4% had fair and 2.1% had poor oral hygiene. And among 14-15 years age group, 76.8% had good, 22.6% had fair and 0.6% had poor oral hygiene. There is no significant difference between the two age groups i.e. 9–10 and 14–15 school children in oral hygiene status. Our results were not in relation to that of Ojahanon PI *et al*., as their results showed poor oral hygiene status among the study population. He stated that it was mainly because of poor facilitates available to them [19]. Fluorosis is an endemic disease prevalent in 20 states out of the 36 states and Union Territories of the Indian Republic [20, 21] Saliva also has a major effect on caries [22]. In India, 40–70% districts are affected in Bihar, National Capital Territory of Delhi, Haryana, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Tamil Nadu and Uttar Pradesh.[23,24] The fluoride levels of the drinking water in Uttar Pradesh range from 0.2 to 25.0mg/L, the maximum level of which is well above the normal range of 1.5mg/L as stated by World Health Organization. In our Study we assessed the prevalence and we found that the population was least affected, in government School students only 9.7 % of the total sample had Dental Fluorosis and 7.1 % in private school students. Thought the findings were more in government school students but was not statistically significant when compared to that of private school students. On the Basis of Severity 82.7 % had milder forms where as 12.6 % had moderate form and only 4.7 percent had severe form of Dental Fluorosis. Milder forms of fluorosis were more common than its severe forms in this study. The results were in accordance with the findings of Srivastava *et al*., [21] and Naidu *et al*., [22] The prevalence of dental fluorosis among both the genders were almost equal. This finding was in accordance with the ones observed in other studies [24-28]. Universally, in the literature, no tendency towards developing dental fluorosis has been reported by either of the genders.

CONCLUSION

Our study suggested that the prevalence of dental caries was more in private school students, but the resultant was statistically insignificant. The mean DMFT score of 9-10 years school children was the lowest whereas the DMFT score of 14-15 years was the highest and was statistically significant. Oral hygiene among government school students and private school students were comparable and statistically insignificant. Percentage of school children, who had dental fluorosis, was high among government school as compared to private school. Awareness among the children is very important as they are the buddings for future. They also spread awareness among family and public simultaneously we are preparing them form the childhood for their care in oral health and general health. Prevention is always better then cure.

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