International Journal of Community Medicine and Public Health
Rane S et al. Int J Community Med Public Health. 2024 Jun;11(6):2277-2284
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20241485

Original Research Article

Evaluation and comparison of the oral health status of children in government and private schools between 6 to 9 years of age in Sangli city

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Received: 26 March 2024
Revised: 02 May 2024
Accepted: 03 May 2024

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ABSTRACT

Background: To evaluate and compare the Oral health status of children in Government and Private schools between 6 TO 9 years of age in Sangli City
Methods: Subjects were selected by Cluster Random Sampling and all students between 6 to 9 years of age from the selected schools were examined. Screening was done on the basis of WHO oral health assessment form for children (2013). Consent was taken from the parents or the concerned authorities prior to the examination of the children. The examination was carried out by one trained and calibrated investigator using a mouth mirror and CPI probe under natural daylight.
Results: A total of 1000 children (500 governments and 500 private) were examined in the study. The estimates of non-carious teeth, carious teeth, enamel fluorosis and dental trauma between private and government school children were compared. There was significant difference found in non- carious tooth estimate (p=0.003) and carious teeth estimate (p=0.005). The children in private school had more non carious teeth (mean: 16.45) when compared to government children (mean: 15.89). Similarly, the children in private school had less amount of carious teeth (mean: 3.31) when compared to government children (mean: 3.84). There was no significant difference found with respect to fluorosis (p=0.683) and dental trauma (0.319) in the children of government and private schools.
Conclusions: The prevalence of oral diseases was relatively less among children from private schools in comparison with those from government schools.

Keywords: Oral health, Government schools, Private schools

INTRODUCTION

Oral health is an inseparable part of general health. In the last 2 decades in many industrialized countries, a significant improvement in oral health among children and adolescents, especially with respect to dental caries has been witnessed.[1] This dramatic change in the trend can be attributed to the modification in the dietary habits, effective use of fluorides, improved oral hygiene practices, and establishment of school-based preventive programs.[2] India, a developing country, faces many challenges in rendering oral health needs. The majority of Indian population resides in rural areas.[3] It is necessary to know the prevalence and distribution of oral health problems and understand the dental health practices that people follow. Such information is basic for formulation of oral health policies and appropriate programs. The appropriate policies and programs will facilitate in

improving awareness and knowledge of the general public about the preventive and promotive aspects of oral health as well as, to create the required services and train the necessary dental manpower to meet these needs.[4] Dental caries and periodontal diseases are widespread and virtually everybody suffers from them. Dental caries is the most prevalent disease among children in the global scenario. According to the World Health Organization (WHO) it is next to the common cold in children. Several studies undertaken in different parts of the country show that dental caries has been consistently increasing in its prevalence and severity.[5] Along with dental caries; gingivitis is also an oral health issue in children due to poor oral hygiene maintenance techniques. Gingivitis is inflammation of the soft tissue without apical migration of the junctional epithelium. Redness, edema and bleeding on probing characterize this condition. When treated, gingivitis is reversible with no permanent damage. Untreated cases may lead to a more complex and destructive entity known as chronic periodontitis.[6] Also, traumatic dental injuries to anterior teeth are a significant public health problem, not only because their prevalence is relatively high, but also because they have considerable impact on children's daily lives. Traumatic dental injuries (TDIs) cause physical and psychological discomfort, pain and other negative impacts, such as tendency to avoid laughing or smiling, which can affect social relationships. Injuries during childhood have been considered a global public health problem and injuries have become the primary cause of death and disability of human beings.[7] Oral health and general well-being are inextricably bound to each other. If the oral health of children develops unfavourably, they should be considered a risk group demanding special attention for planning of Dental Health Program.[8] It is important to identify the risk groups to best utilize the scant resources in the present circumstances. The assessment of oral health status of children in government and private schools may provide us baseline data on the oral health status of children from different socio-economic background. This helps in prioritizing the services to the high risk groups when policies and programs for school going children are implemented. The surveys reporting the oral health status of government and private school children were scanty in Sangli city. The present study assessed and compared the oral health status between government and private school children in Sangli City in an attempt to identify the high risk groups.

METHODS

The present study was conducted to assess the oral health status of children in Government and Private schools between 6 to 9 years of age in Sangli city. The present study has been conducted over the period of 2 years from December 2014 to January 2016. Schools were selected by Cluster Random Sampling and all students between 6 to 9 years of age from the selected schools were examined. Screening was done on the basis of WHO oral health assessment form for children (2013). Consent was taken from the parents or the concerned authorities prior to the examination of the children. Permission was obtained from the Block Education Officer, Head Master/ Head Mistress of respective schools and Research and Ethical Committee of Bharati Vidyapeeth Deemed University before examining the children.

Sample size

The sample consisted of 1000 school children aged 6-9 years in Sangli City. Cluster Random Sampling technique was used to select children who met the following inclusion criteria and were present on the day of the study. Out of the 1000 children, 500 were from government school and remaining 500 were from private school.

Inclusion criteria

Inclusion criteria were; Children with overall good general health and perception, Children present on the day of the examination and Children between the age group of 6 to 9 years with early mixed dentition.

Exclusion criteria

Exclusion criteria were; Children with known systemic conditions, Children with cleft lip and palate, Children whose parents refuse to give consent, Children who were physically or mentally challenged and Extremely uncooperative children.

Armamentarium

Mouth Mirror, CPI probe, Sterile Kidney Tray, Disposable Gloves, Disposable mouth masks, Cotton Rolls**,** Disinfectant Savlon Solution. (Chlorhexidine sol I.P. 1.5% v/v and strong Cetrimide Sol B. P. equivalent to I.P. 3.0% v/w, Colors: Tetrazine and Sunset Yellow FCF), WHO Oral Health Assessment for Children (2013) and Consent form for Parents.

Method of examination

Autoclaved instruments from the college were taken for the purpose of the study. Spot sterilization was done during the survey using disinfectant solution- Savlon. The clinical examination of all 1000 school children was entirely done by single investigator. Each child was examined on an ordinary upright chair with a mouth mirror and CPI probe in an adequate natural light. Prior to examination, the teeth were cleaned and dried with cotton roll to eliminate confusing effects of food debris and saliva. The examination was done by one examiner to eliminate error. Examination was carried out in the uniform manner, starting from the most posterior tooth in maxillary right quadrant and then in clockwise direction. The oral health status was assessed as per the WHO oral health assessment form for children 2013. The dentition status, periodontal status, enamel fluorosis, dental trauma

was recorded according to the scores given in the WHO criteria 2013. The school children were divided into two groups of 500 children each both males and females. Group 1- Children from government schools. Group 2- Children from private schools.

Statistical analysis

The following methods of statistical analysis have been used in this study. Data was entered in Microsoft excel and analyzed using SPSS (version 12). Qualitative data was presented as frequency and percentage. For comparison of estimates between government and private school; males and females the unpaired t test and Man Whitney U test was applied to the continuous and categorical data respectively. For all the tests the level of significance was set at $p \leq 0.05$.

RESULTS

Out of the total study population of government and private schools, there were 298 (59.6%) males and 202 (40.4%) females in government schools and 290 (58%) males and 210 (42%) females in private schools (Table 1). 588 males and 412 females Total 1000 that participated in the study.

Table 1: Distribution of study subjects according to gender in both government and private schools.

Parameters			N	%
Government	**Sex**	Male	298	59.6
		Female	202	40.4
		Total	500	100.0
Private	**Sex**	Male	290	58.0
		Female	210	42.0
		Total	500	100.0

Table 2: Distribution of study subjects according to positive periodontal findings in government and private schools.

Group			N	%
Government	Perio	0	444	88.8
		1	56	11.2
		Total	500	100.0
Private	Perio	0	489	97.8
		1	11	2.2
		Total	500	100.0

Table 3: Distribution (mean rank) of study subjects according to positive periodontal findings in government and private schools.

Ranks	Group	N	Mean Rank	P value
Perio	Government	500	523.00	0.001
	Private	500	478.00	
	Total	1000	-	

The complete oral health assessment was carried out and the dentition status, periodontal status, fluorosis and dental trauma were mainly assessed. Out of 500 students examined in government schools 56 (11.2%) children showed positive periodontal findings whereas in private schools only 11 (2.2%) out of 500 children showed positive periodontal findings (Table 2).

There was significant difference found between the positive periodontal findings (p=0.001) between government and private school children. The children in private school had less positive periodontal findings (Mean Rank: 523.00) when compared to government children (Mean Rank: 471.00) (Table 3). The prevalence of enamel fluorosis was found to be very less in both government and private school children. In government schools there was no fluorosis seen in 497 (99.4%) children, only 3 (0.6%) children showed questionable to mild fluorosis. Almost similar results were seen in private school children; 498 (99.6%) children showed no signs of fluorosis while only 2 (0.4%) children showed very mild fluorosis.

Table 4: Distribution of study subjects according to presence of dental trauma in government and private schools.

Groups			N	%
Government	Dental Trauma	0	491	98.2
		2	6	1.2
		3	2	0.4
		4	1	0.2
		Total	500	100.0
Private	Dental Trauma	0	488	97.6
		2	6	1.2
		3	2	0.4
		4	3	0.6
		5	1	0.2
		Total	500	100.0

After examining the children for traumatic injuries to the permanent anterior teeth it was found that in government school children out of 500 children 6 (1.2%) showed enamel fracture, 2 (0.4%) children showed enamel and dentin fracture and only 1 (0.2%) child showed fracture of tooth involving the pulp. In private school children 6 (1.2%) showed enamel fracture, 2 (0.4%) showed enamel and dentin fracture, 3 (0.6%) children showed fracture involving pulp and only 1 (0.2%) child showed missing tooth due to trauma (Table 4).

The estimates of non-carious teeth, carious teeth, enamel fluorosis and dental trauma between private and government school children were compared. There was significant difference found in non- carious tooth estimate (p=0.003) and carious teeth estimate (p=0.005). The children in private school had more non carious teeth (mean: 16.45) when compared to government children (mean: 15.89).

Similarly, the children in private school had less amount of carious teeth (mean: 3.31) when compared to government children (mean: 3.84). There was no significant difference found with respect to fluorosis (p=0.683) and dental trauma (0.319) in the children of government and private schools (Table 5).

Table 5: Comparative estimation of non-carious teeth, carious teeth, enamel fluorosis and dental trauma between private and government school children.

Parameters	Group	N	Mean	SD	T value	P value
Non-carious	Government	500	15.89	3.188	-3.021	0.003
	Private	500	16.45	2.672		
Carious	Government	500	3.84	3.174	2.841	0.005
	Private	500	3.31	2.682		
Enamel fluorosis	Government	500	0.01	0.167	0.409	0.683
	Private	500	0.01	0.141		
Dental trauma	Government	500	0.04	0.338	-0.997	0.319
	Private	500	0.07	0.475		

Table 6: Comparative estimation of non-carious teeth, carious teeth, enamel fluorosis and dental trauma between 6 years, 7 years, 8 years and 9 years of age.

Descriptives		N	Mean	SD	SE	F value	P value
Non-carious (years)	6	255	16.22	3.590	0.119	0.119	0.949
	7	260	16.08	2.891	0.179		
	8	244	16.19	2.509	0.161		
	9	241	16.21	2.694	0.174		
	Total	1000	16.17	2.953	0.093		
Carious (years)	6	255	3.66	3.587	0.225	0.479	0.697
	7	260	3.70	2.840	0.176		
	8	244	3.45	2.528	0.162		
	9	241	3.47	2.710	0.175		
	Total	1000	3.57	2.948	0.093		
Enamel Fluorosis (years)	6	255	0.01	0.125	0.008	0.289	0.833
	7	260	0.01	0.186	0.012		
	8	244	0.00	0.064	0.004		
	9	241	0.02	0.203	0.013		
	Total	1000	0.01	0.155	0.005		
Dental Trauma	6	255	0.00	0.000	0.000	16.468	0.001
	7	260	0.01	0.186	0.012		
	8	244	0.01	0.128	0.008		
	9	241	0.22	0.787	0.051		
	Total	1000	0.06	0.412	0.013		

Table 7: Comparative estimation of dental trauma between 6 years, 7 years, 8 years and 9 years of age.

Dependent variable	Age comparison		Mean difference	SE	P value
Dental Trauma	6	7	-0.012	0.036	0.988
		8	-0.008	0.036	0.996
		9	-0.216*	0.036	0.001
	7	6	0.012	0.036	0.988
		8	0.003	0.036	10.00
		9	-0.204*	0.036	0.001
	8	6	0.008	0.036	0.996
		7	-0.003	0.036	1.000
		9	-0.208*	0.037	0.001

*Statistically significant

The estimates of non-carious teeth, carious teeth, enamel fluorosis and dental trauma between boys and girls were also compared. There was significant difference found in dental trauma estimate (p=0.05). The boys showed a higher incidence of dental trauma (Mean: 0.8) as compared to the girls. (Mean: 0.3) There was no significant difference found with respect to non-carious (p=0.749), carious (p=0.769) and enamel fluorosis (p=0.195) between the boys and girls. The estimates of non-carious teeth, carious teeth, enamel fluorosis and dental trauma between the age groups of 6 years, 7 years, 8 years and 9 years were also compared. There was significant difference found in dental trauma estimate (p=0.01). The dental trauma experienced was higher at 9 years of age (Mean: 0.22) as compared 6 years, 7 years and 8 years of age (Mean: 0.1) (Table 6).

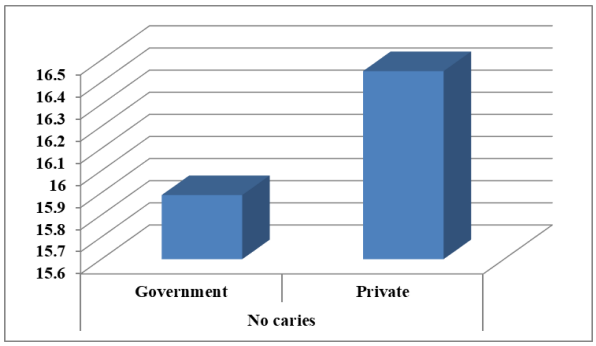

Figure 1: Comparative estimation of non-carious teeth between private and government school children.

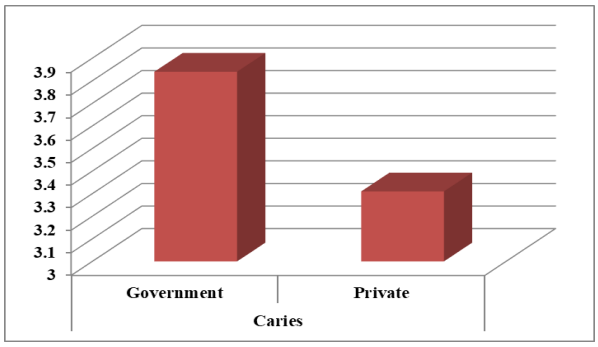

Figure 2: Comparative estimation of carious teeth between private and government school children.

When the dental trauma estimates were compared with between all age groups and it was found that the estimate was statistically significant (P value: 0.001) only at 9 years of age when compared with 6 year, 7 year and 8 year old children (Table 7).

DISCUSSION

A healthy oral cavity enables an individual to speak, eat and socialize without the feeling of any discomfort or embarrassment[9] Schools provide a platform for the promotion of general health and oral health not only for the students, but also for the staff, families, and members of the community as a whole.[10]

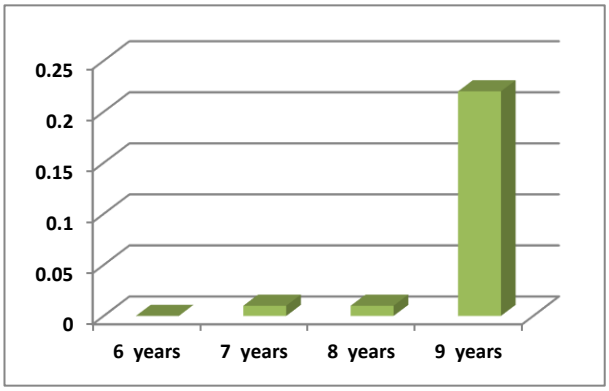

Figure 3: Comparative estimation of dental trauma between 6 years, 7 years, 8 years and 9 years of age.

Although, oral health is an integral part of general health, it has not received any significant consideration in national health policies or in the planning of national health programs in many developing countries.[11] The present study was undertaken to assess and compare the oral health status of children from government and private schools which may be a proxy for children from different socio-economic background. Since no previous studies have been conducted in western Maharashtra, hence this study was undertaken to provide a baseline data for the identification of high risk groups and prioritizing the services to the most deserving especially when resources are sparse. In our study we have used the WHO oral health assessment form for children for the complete assessment of the oral health status, as this is a standardized proforma used worldwide. In our study we found that higher percentage of children from the private schools had good overall oral hygiene compared to government school children. This may be attributed to the fact that oral hygiene practices.[3,12-15] and dental care utilization are better among children from private schools. The result was in agreement with the widely held view that the private school students were from relatively higher socio-economic status families than the government school children and as a result, there was close monitoring of tooth brushing habits especially in the morning among children from private schools.[16]

A study by Lateefat et al found a higher percentage of students attending the private school to have good oral hygiene status (61.4%) compared to those attending public school (21%). Another study by Batwala et al found lower odds for plaque; odds ratio (OR): 0.6, 95% confidence interval (CI): 0.4-0.9 and calculus (OR: 0.4, 95% CI: 0.2-0.9) among school children attending private schools in comparison to children of government school.[17-19] The present study also showed that the positive periodontal findings were significantly higher in government school children as compared to private school children. These results suggest that the frequency

of tooth brushing and using tooth brush as a method of cleaning the oral cavity is probably more in the private school children; this result is in accordance with a study conducted by Rao et al also in our study there was no significant difference found in the periodontal conditions between males and females as observed by Chauhan et al in their study. [20,21] In the present study, we observed that children in government school experienced significantly more dental caries than children of private school. The caries experience is a good indicator of chronic deprivation and disadvantage status of government school children as they have limited resources, poor awareness, and poor access to dental care. There is also an economic burden on parents with regards to the dental treatment.[22] The role of parents' education and social status also plays a very important and significant role with regards to the oral health of children; hence the children attending private schools were seen to have more number of non-carious teeth as compared to government school children. The results of our study were similar to the results of the study conducted by Sukhabogi et al and Kumar et al Another study conducted by Gupta et al on the urban and rural school children of Jaipur, they found contradicting result to our study ; their results showed that dental caries was significantly ($p<0.001$) lesser in rural areas (27.94%) than in the urban areas (47.38%).[23-25]

The results of our study also showed that there was no significant difference in the caries experience between males and females. Also all the age groups considered in our study showed almost equal caries incidence ; while a study conducted by Kumar et al showed contradictory results in which males had a higher predilection for dental caries than females.[24] Our study also suggested that there is no evidence of increase in caries incidence with increasing age of the child. The factors such as diet, tooth brushing and frequency of snacking contribute to the etiology of dental caries along with the knowledge and attitude of the parents towards dental health care. Dental trauma is also a part of oral and general health. Facial esthetics plays an important role in self-identification, self-image, self-presentation and interpersonal confidence. A traumatic dental injury, be it fracture, discoloration of teeth or avulsion of tooth will alter facial appearance. What is more, the effects of traumatic dental injuries on self-esteem and self-awareness are important because the majority of traumatic dental injuries occur in the early years of life and adolescence.[26] Apart from the pain and discomfort associated with any fracture of a tooth, its psychological effect on children and their parents are also very important.[27] In our study we observed that there was no significant difference between occurrence of dental trauma between the government and private school children, but we found a significant difference between the males and females with respect to the same. Our study showed that males had a higher incidence of dental trauma as compared to females. The results were in accordance with the studies conducted by Gojanur et al and Ravishankar et al.[28,29] The results of our study contradicted to the results of the study conducted by Sumanth et al which stated that there was no statistically significant difference between the occurrence of trauma between males and females; also they found no significant difference between children of government and private schools which was supporting the results of our study.[30] Since boys take more interest in contact sports and other sports as compared to girls, there is more incidence of trauma in boys. Also the major causes of the injuries are due to falls. The second most frequent was collision during contact sports or other activities followed by violence.[31] The age at which children are most prone to the traumatic injuries should be identified so that the preventive measures can be directed to protect the risk population to a considerable extent. In this study, the peak age to sustain injury was found to be 9 years; this is supported by previous studies by Rocha and Patel. [32,33] During 8-10 years of age maximum physiologic maxillary growth takes place, there is transition of incisors in which the permanent incisors are proclined as compared to the primary incisors at the same time this age group exhibits an increased period of outdoor and reckless activities which increase the liability to injury. Singh observed similar results.[34] Contradicting results were observed by Sushma Gojanur et al in their study which said that the maximum incidence of traumatic injuries was observed in 5-year-old children and compared to 8 year olds.[28] In our study the incidence of enamel fluorosis was negligible when compared between government and private school children and also when the age and sex of the children were considered. The present study may be considered as a pilot study in the city of Sangli. The results of the present study need to be validated by a larger study on a state-wide basis.

Limitations

Less than Six-year-old children were not included (limited age group). Few school children were included in entire Sangli city or district (smaller sample size). Study was conducted only in selected schools of Sangli City.

CONCLUSION

This comparative study conducted between the children of government and private school children to assess the oral health status concluded that the incidence of dental caries was higher in government school children; the incidence of non-carious teeth was higher in private school children. There was no gender or age predilection found with regards to dental caries experience. Positive periodontal findings were seen to be higher in children attending government schools as compared to private schools. There was no difference seen in girls and boys the findings remained similar at all the age groups. Dental trauma was seen to be more prevalent in boys than the girls also the incidence of dental trauma is seen to be increasing with the advancing age. There was no significant difference observed in the prevalence of dental trauma in government and private school children. Thus, from our study we can conclude that there is a need for

instilling a positive attitude among the children and parents towards dental treatment. Oral health care services need to be offered specially to children from government schools which normally house children from low socio-economic background on a priority basis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Rane S, Shigli A. Evaluation and comparison of the oral health status of children in government and private schools between 6 to 9 years of age in Sangli city. Int J Community Med Public Health 2024;11:2277-84.