ORIGINAL RESEARCH

Relationship of Socioeconomic background to Gingival status and Dental status among Government school children in Davangere, Karnataka, India: A Cross Sectional Study

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ABSTRACT

Introduction:- The preservation of healthy teeth is one of the key health issues in childhood, adoption of consistent behavioral habits in childhood takes place at home, with the parents being the role model. The differences of socio-economic status is reflected not only in the general health but also within the dental condition of the various communities. Moreover, parental oral health knowledge and attitude are known to influence their child's oral health hygiene. **Aim and objectives:-** To evaluate the role of parental socioeconomic status in relation to the gingival status and dental status among government school children aged between 12-15 yrs of Davangere city and to assess the oral health knowledge, attitude and behavior of children and their. **Material and methods:-** A cross-sectional study was conducted using a questionnaire to assess the Socio-economic status, oral health related knowledge, attitude and behavior of 12-15 years old government school children and their parents. ADA type III clinical oral examination of children was performed to record the dentition status and gingival status of their permanent dentition using WHO 2013 proforma for children. This is followed by distribution of a questionnaire to the children and their parents for collecting the data regarding Socio-economic status, oral health related knowledge, attitude and behavior. Chi-Square test, Unpaired t-test, Mann-Whitney U test, Spearman's rank correlation was used to analyze the data using SPSS version 22. **Results:-** The Overall DMFT score was low among Government school children. Around 43.8% of children were with the presence of bleeding on probing, and all of them were males. Direct relation of parental SES was seen with DMFT score, inverse relation of parental SES was seen with Bleeding on probing score. Around 91.66% of parent's agreed that regular tooth brushing helps to prevent dental caries and gum problems. 63.09% of parent's agreed that bleeding on brushing is an early sign of gum disease. Approximately 61.19% of the participating parents said that they received information on dental health and major (47.85%) source of information was from the dentist. Majority of the participating children (95.70%) and parents (98.09%) in the present study said that they don't use any other oral hygiene aids to clean their mouth. **Conclusion:-** From the results of the present study, we can conclude that the children of parents from lower middle class had a poor gingival condition, and the oral health knowledge among the parents was considerably lower, but they showed a positive attitude towards oral health and dental professionals.

KEYWORDS: Government school children, Dentition status, Socio-economic status

INTRODUCTION

Oral health is an important part of physical health and is essential for self-esteem, self-confidence and overall quality of life.[1,2] The preservation of healthy teeth is one of the key health issues in childhood, adoption of consistent behavioral habits in childhood takes place at home, with the parents being the role model. It is believed that many oral health problems can be reduced or even avoided when parents/caregivers have access to information on oral health.[3,4] Indeed, adolescence is a crucial period of transition with personal responsibility for preventing dental disease beginning at this age and determining future oral health.[5] Therefore, assessing the oral health knowledge, attitude and behavior among parents and children is essential.

Dental caries and gingival diseases have been considered the important global oral health burdens affecting 60-90% of schoolchildren in the world (WHO). The risk behaviors for dental caries and periodontal disease can be habituated from early childhood or can be initiated during adolescence as parent's being the role model.[5] Therefore assessing the dental status and Gingival status of school children is essential.

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Despite of tremendous attainment in the oral health of populations worldwide, problems still persist in many communities all over the world - especially among lower socio-economic framework in both evolved and evolving countries. The disparities of socio-economic status most probably reflected in the general health including the dental condition of the various communities.[6] Over the last century, health has improved significantly. This improvement, however, has not been experienced equally across the population in India. The major part of Indian population inhabited in rural areas. [7,8]and Children <18 years constitute about 40% of the Indian population. [9]According to current estimates, 80% of all schools in the country are government schools, making the government, the major provider of education [8] and children from the government schools which normally house children from low socio-economic background on a priority basis. School health programs have proven effective in promoting health in many developed countries.[10,11,12] The children in schools are relatively easily accessible, compared to any other population groups for any health promotion programs.

The surveys reporting the Gingival status, the Dental status of Government school children, knowledge, attitude, and oral health behavior of parents and children of the Government school were scanty in Davangere, Karnataka, India. Hence this cross sectional study was planned with 12 to 15 years age group school going children, as these are global monitoring ages for international comparisons and monitoring of disease trends.

The present study was conducted with the following objectives to evaluate the DMFT score, Bleeding on Probing of children using WHO proforma 2013 for children among boys and girls, to assess the knowledge, attitude, and behavior of parents towards their oral health and behavior of children towards their oral health. To correlate the parental socioeconomic status with DMFT score and Bleeding on probing of their children.

MATERIALS AND METHODS

The present study was a cross-sectional study which was carried out over a period of 59 days during the period of January to February 2016. Ethical approval was obtained from the institutional ethical board of College of Dental sciences (CODS) and informed consent was obtained from the participants.

Sample size estimation:- A pilot study was conducted among 30 school children and their parents attending nearby school to assess the feasibility of the study and for sample size estimation.

Sample size was estimated by using the following formula:

Sample size = $n = \frac{z^2 \times p \times q}{d^2}$

where,
d = allowable error = 15 % of p
p = prevalence = 30
q = 100-p = 70
z = 1.96

Substituting the values obtained from the pilot study, in the following formula,

Sample size = $\frac{(1.96)^2 \times 30 \times 70}{(4.5)^2}$

So the sample size was approximately 398. But considering the dropouts and missing data, the sample was rounded off to 420. Pilot study participants were not included in the main study.

The questionnaire used for parents to assess their SES, oral health knowledge, attitude and behavior and for children to assess their oral health behavior was previously validated by piloting, and the appropriate changes have been made before it was finalized for the study. a mean Content Validity Ratio (CVR) of 0.85 was found for the parental questionnaire and 0.80 for children questionnaire. The list of schools was obtained from District Education Office showed that the city is divided into north and south zones. By using lottery technique, two schools from north and two schools from south zone were randomly selected for the study. The 12-15years old school children present on the day of examination and those who gave informed consent were included in the study until the total sample size of 420 was achieved. This is followed by ADA **Type III** clinical oral examination of children within the school premises under strict aseptic precautions to record the number of decayed, missing and filled component of their permanent dentition and their gingival status was assessed using WHO 2013 proforma for children. Kappa value for intra-examiner reliability was 0.82 for DMFT and 0.89 for gingival status. Children were asked to fill the questionnaire related to their oral health behavior in front of the examiner, adequate time was allotted, and later the parental questionnaire was distributed among the school children to carry home and get it back filled by the head of the family. A small incentive like oral hygiene kit was also offered to the children for this purpose. Children suffering from severe systemic diseases, not staying with their parents, undergoing orthodontic treatment and who have undergone dental treatment in the past 3 months were not included in the study.

The data from 420 school children and their parents so obtained was entered in Excel sheet, descriptive and inferential statistical analysis was made. Statistical Package for Social Sciences software (SPSS) version 22.0 was used for data analysis.

The DMFT score between the male and female school children at same time interval was analyzed using unpaired t-test. The variation of presence or absence of Bleeding on Probing between the male and female school children at same time interval was analyzed using Mann-Whitney U test. Chi-square test was done for the questionnaire of parents and children separately. The SES among the parents of all the participating school children

were assessed using descriptive statistics. Spearman's Rank Correlation was done to correlate the socio-economic status of the parents with their children DMFT score and bleeding on probing score. p value ≤ 0.05 was considered statistically significant.

RESULTS

Total sample size comprised of 420 students and their parents, with a response rate of 100 %

Majority of the participating parent's (58.33%) were in Lower middle class (Fig 1), Around 51.42% of participating school children were females (Fig 2).

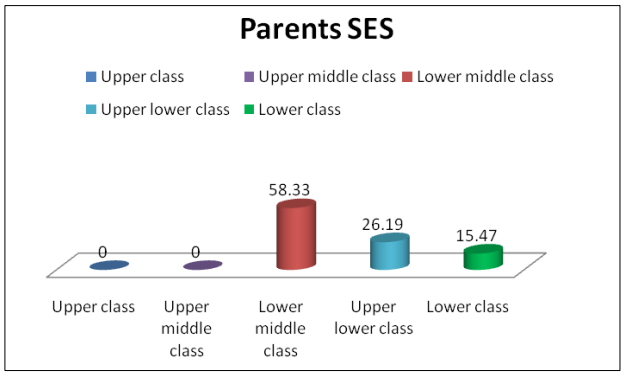

Fig 1:- Percentage Distribution of parents according to their Socio-economic status (SES)

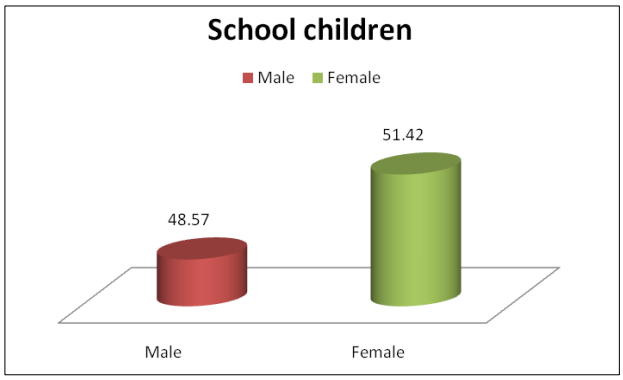

Fig 2:- Percentage Distribution of school children according to their gender

Table 1:-Depicts the association of 12-15-year-old school children Behavior towards their oral health.

Almost all the school children in the present study said that they brush their teeth. 22.61% of girls said that they brush twice a day which was more compared to boys and there is statistically highly significant difference in behavior. Approximately 50% of children said that they use toothpaste as an agent to brush and all of them were girls.

Table 2:- Depicts the association of Parents Knowledge and Attitude towards their oral health.

Around 91.66% of parent's agreed that Regular tooth brushing helps to prevent dental caries and gum problems**.** 63.09% of parent's agreed that bleeding on brushing is early sign of gum disease.

Questions	Response	Male	Female	p-value
1) Do you brush your teeth?	a) Yes	204(48.57%)	214(50.95 %)	0.140 (NS) gender
	b) No	0	2(0.47%)	
2) If yes, how many times do you brush your teeth?	a) Once a day	174(41.42%)	121(28.8%)	0.001 (HS) gender
	b) Twice a day	30(7.14%)	95(22.61 %)	
	c)More than twice a day	0	0	
3) With what do you brush your teeth?	a) Tooth brush	192(45.71%)	211(50.23%)	0.007(HS) gender
	b) Finger	0	5(1.19%)	
	c) Neem stick	12(2.85%)	0	
	d)Others	0	0	
4) What is the agent you use to brush your teeth?	a) Tooth paste	190(45.23%)	210(50%)	0.002(HS) gender
	b) Tooth powder	8(1.90%)	6(1.42%)	
	c)Charcoal	6(1.42%)	0	
	d)Brick powder	0	0	
5)Any other oral hygiene aids you use to clean your mouth	a) Yes	4(0.95%)	14(3.33%)	0.001(HS) gender
	b) No	200(47.61%)	202(48.09%)	
6) When do you change your tooth brush?	3 Months	112(26.66%)	123(29.28%)	0.001(HS) gender
	6 Months	83(19.76%)	69(16.42%)	
	More than 6 months	9(2.14%)	24(5.71%)	

Table I:- Behaviour of 12-15 year old school children towards their oral health. Chi-square test NS = Non significant (p>0.05); S = Significant (p≤0.05); HS = highly significant (p≤0.01)

Questions	Option	Response	p-value
1) Regular tooth brushing helps to prevent Dental caries and Gum problems.	Agree	385(91.66%)	0.001(HS) gender
	Disagree	15(3.51%)	
	Don't know	20(4.76%)	
2) Bleeding on brushing is early sign of gum disease?	a) Yes	265(63.09%)	0.050(S) gender
	b) No	81(19.28%)	
	c)Don't know	74(17.61%)	
3) Bacteria is a cause of tooth decay and gum disease?	a)Yes	331(78.8%)	0.002(HS) gender
	b) No	15(3.57%)	
	c)Don't know	74(17.6%)	
4) Have you received any information on dental health?	a) Yes	257(61.19%)	0.001(HS) gender
	b) No	139(33.09%)	
	c)Don't know	24(5.71%)	
5) If yes, from which channel did you receive?	Radio	90(21.42%)	0.001(HS) gender
	Television	98(23.33%)	
	Newspaper	31(7.38%)	
	Dentist/Doctor	201(47.85%)	

Table 2:- Parents Knowledge and Attitude towards their oral health. Chi-square test NS = Non significant (p>0.05); S = Significant (p≤0.05); HS = highly significant (p≤0.01)

Table 3:- Depicts the association of Parents behavior towards their oral health.

All parent's said that they brush their teeth. 91.1% said that they brush once and approximately 93.3% said that they brush with toothbrush and toothpaste. 98% said that they didn't use any other oral hygiene aids.

All the responses mentioned in the above tables were statistically highly significant.

Table 4:- Depicts the Comparison of the mean score of Decayed, Missing, Filled teeth and DMFT score between males and females of 12-15 years government school children.

The Overall DMFT score was low among school children under study. But the comparatively high score was seen

Questions	Option	Response	p-value
1) Do you brush your teeth?	a) Yes	420(100%)	0.117(NS) gender
	b) No	0	
2) If yes, how many times do you brush your teeth?	a) Once a day	383(91.19%)	0.001(HS) gender
	b) Twice a day	37(8.80%)	
	c)More than twice a day	0	
3) With what do you brush your teeth?	a) Tooth brush	393(93.57%)	0.001(HS) gender
	b) Finger	0	
	c) Neem stick	27(6.42%)	
	d)Others	0	
4) What is the agent you use to brush your teeth?	a) Tooth paste	392(93.33%)	0.002(HS) gender
	b) Tooth powder	28(6.66%)	
	c)Charcoal	0	
	d)Brick powder	0	
5) Any other oral hygiene aids you use to clean your mouth	a) Yes	8(1.90%)	0.002(HS) gender
	b) No	412(98.09%)	
6) When do you change your tooth brush?	3 Months	306(72.85%)	0.001(HS) gender
	6 Months	65(15.47%)	
	More than 6 months	49(11.66%)	

Table 3:- Parents Behaviour towards their oral health. Chi-square test, NS = Non significant (p>0.05); S = Significant (p≤0.05); HS = highly significant (p≤0.01)

Caries experience	GOVERNMENT SCHOOL CHILDREN			
	Males	Females	t-value	p-value
Decay	0.74(1.26)	0.82(1.26)	0.054	0.816(NS)
Missing	0.04(0.23)	0. 02(0.10)	0. 033	0.40 (NS)
Filling	0.08(0.487)	0.19(0.727)	11.413	0.211 (NS)
DMFT	0.87(1.374)	1.03(1.349)	0.077	0.781(NS)

Table 4:-Comparison of mean score of Decayed, Missing, Filled teeth and DMFT score between male and females of 12-15 years old government school children. Unpaired t test NS = Non significant (p>0.05); S = Significant (p≤0.05); HS = highly significant (p≤0.01)

among females compared to males, and there was no statistically significant difference among them.

Table 5:- Depicts the Comparison of presence or absence of Bleeding on probing among 12-15 years school children

Bleeding on probing	Present	Absent	Mean rank	p-value
Males	184(43.80%)	44(10.47%)	165.13	0.008 (HS)
Females	100(23.80%)	92(21.90%)	187.31	
Total	284(67.61%)	136(32.38%)		

Table 5:- Comparison of presence or absence of Bleeding on probing among 12-15 years school children. Manwhitney U test, NS = Non significant (p>0.05); S = Significant (p≤0.05); HS = highly significant (p≤0.01)

Around 43.8% of children were with the presence of bleeding on probing, and all of them were males. The difference of presence or absence of bleeding on probing was statistically highly significant among male and female school children.

Table 6:-Correlation of the Socio-economic status of Parents with dentition status and Gingival status of their children.

	DMFT		Bleeding on Probing	
	r	p	r	p
Socio-economic status	0.009	0.783(NS)	-0.612	0.05(S)

Table 6:- Association and Correlation of Socio-economic status of Parents with Oral Health Status of children. Spearman correlation, r = correlation value, NS = Non significant (p>0.05); S = Significant (p≤0.05); HS = highly significant (p≤0.01)

Direct relation of parental SES was seen with DMFT score. The inverse relation of parental SES was seen with Bleeding on probing rating, and there was a significant relation between them.

DISCUSSION

Health-related practices of family members are derived from the norms, values, and goals of the family. Through primary socialization, a growing child learns the norms, values, and behaviors of the group in which he/she is raised, usually from his/her parents. [13] Parental skills and attitudes toward oral hygiene may have an impact on the formation of their children's oral hygiene habits and the prevalence of oral diseases. Moreover, studies have reported that parental education and family income have a direct impact on children's oral health.[14] India, a developing country, faces many challenges in rendering oral health needs. Children <18 years constitute about 40% of the Indian population. The schools provide a crucial environment, offering an efficient and effective way to approach children globally and through them, families and community members. At a global level, rapid changes in the pattern of oral disease have been observed during the past decade. In most industrialized countries, the occurrence of dental caries in children has declined dramatically. Such changes are observed in parallel with improved socio-economic conditions, changing lifestyles, self-care practices, use of fluorides, and effective use of preventive oral health services.[4] The present study is a cross sectional study with 12 to 15 years age group school going children from Government school, in order to have a representation of children from the lower socio- economic and cultural communities.

In the current study both boys and girls were almost equally affected by caries with slightly higher prevalence among females, similar to study by Sogi G[15], Fotedar Shailee et al.[16], Mohammed Al-Darwish et al.[17] and there is no statistically significant difference between them which is similar to study by SS El-Qaderi et al.[18] The mean DMFT score among government school children was 0.8 (0.9) in a study by Sukhabogi et al. [19] similar to our study**.** The DMFT score may be low in the present study due to the fluoride level present in the water of Davangere city, which is 0.64 to 2.64 ppm according to Gayathri R et al.[20]

The overall prevalence of bleeding on probing was high (67.61%) among government school children, and the majority of them were males in the present study. A significantly higher number of children in the government schools had gingivitis in a study by Sukhabogi et al. [19]Mahesh Kumar P et al. [21], Halwai HK et al. [22] similar to our study. This high prevalence may be attributed to improper oral hygiene practice, inadequacy of awareness, accessibility, or underutilization of dental care provisions by the children in the government schools**.**

Inverse relation of Socio-economic status (r= -0.612) was seen with Bleeding on probing in the present study which is contradictory to a study by Elham B et al.(Iran)[23].

In the present study, to begin with questions were asked regarding the following to children and their parents

Majority (91.66%) of the participating parent's were in agreement that regular tooth brushing helps to prevent dental caries and gum problems in the present study similar to a study by Kanica Singhal et al. [24] and Vinay S et al. [25] Approximately 63.09% of participating parents agreed that bleeding on brushing is early sign of gum diseases in the present study which is less compare to the study by de-Silva Sanigorski et al.[26] Approximately 61.19% of the participating parents said that they received information on dental health and major(47.85%) source of information was from dentist similar to a study by Petersen P.E et al.[27] 91.19% of parent's and 70.22% of children in the present study said that they brush only once in a day. Where as, in studies conducted by Regis D. et al. [28] Freeman R. et al.[29] showed that 66.1% and 75% of children brushed twice a day respectively. Preponderance percentage (95.94%) of school children in the study answered that they brush their teeth with the tooth brush and with toothpaste. 93.57% of parents said that they brush their teeth with the tooth brush and with toothpaste similar to a study by Durward S.C. and Wright F.A[30], Clement C A.[31] Majority of the participating children (95.70%) and parents (98.09%) in the present study said that they don't use any other oral hygiene aids to clean their mouth similar to a study by Al-Omiri et al. [32] In a study conducted by Walsh M.M[33], 75% of the children used dental floss which is more compared to present study. This also could be attributed to the difference in oral health education, awareness and the cost of such aids in different parts of the world. Approximately 73% of parent's and 55.94% of participating children said that they change their tooth brush for every 3 months. Where as in a study by Mohammed Ahad and Gheena.S[34] 39.3% of children said that they change their brush once within every 3 months which is very less compare to present study. The Higher percentage in the present study may be due to adequate knowledge on the importance of brushing, practice the habit of changing their brush at the appropriate time among parents and children.

Strengths of the study:

1. Study participants were recruited from the government schools, which normally house children from low socio-economic background and 80% of all schools in the country are government schools.
2. It can act as a stepping stone for further organized school oral health programs as schools provide an important setting for promoting health through them, the school staff, families and the community as a whole
3. Providing the framework for the oral health activities appears essentially to be aiming at prevention and health education rather than on general health aid.

Limitations :

1. As this study is cross-sectional, it evaluates source and outcome at the same point in time, introducing the problem of temporal ambiguity and incapability in proving a causal relationship.
2. This study involved only Government school students and their parents. Further studies are recommended in a cross-section of the population represented by all sections of society
3. Parents were not contacted directly; there is a barrier between the trained examiner and parent communication. So special efforts may be taken to eliminate this barrier.

CONCLUSION

The results of the current study shows that the children of parents from lower middle class had a poor gingival health, and the oral health knowledge among the parents was considerably lower, but they showed a positive attitude towards oral health and dental professionals. The results indicate that not only oral health knowledge but attitude and oral health behavior of parents had an influence on dental caries and gingival status of their children.

Recommendations: While this study examined the oral health knowledge, attitude and behavior of parents, oral health behavior of children; the gingival and dental status of school children, more detailed studies probing these issues in depth are needed in different target populations. Although, oral health care services needs to be offered for all children, it is very essential to offer these services to children from government schools which normally house children from low socio-economic background on a priority basis. Oral health awareness among the parents and school children should be increased for which the health professionals working collectively need to support the development of a "sound strategy".

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