

Prevalence Of Dental Caries, Socio-Economic Status And Treatment Needs Among 5 To 15 Year Old School Going Children Of Chidambaram

Joyson Moses, B N Rangeeth, Deepa Gurunathan

ABSTRACT

Dental caries is a disease with multifactorial causes. The prevalence and incidence of dental caries in a population is influenced by a number of risk factor such as sex, age, socioeconomic status, dietary patterns and oral hygiene habits. Thus the present study was designed to assess the prevalence of dental caries in school children in Chidambaram between 5-15 age groups. **Materials and methods:** The study population consisted of 2362 children, 1258 were boys and 1104 were girls. A total of 7 schools were selected. Trained Dental Surgeon was involved in the examining and the children were examined according to the Dentition status and Treatment Needs, WHO oral health assessment 1987. **Results:** Off all the three groups,

group II (9-11yrs old) had high percentage of caries. In total, dental caries were observed in 1484(63.83%) of study population. The mean (\pm SD) value of dmft/DMFT of all groups, the decayed teeth accounted for the greatest percentage. In all 80.4% of the student belonged to low socio-economic group **and** showed dental caries. Restoration was the most required treatment in all three groups which was follow by pulp therapy. **Conclusion:** The result of this study is a pointer to the fact that there still exist a large segment of the population who continue to remain ignorant about the detriment effects of poor oral health and the multiple benefits enjoyed from good oral health.

Key Words: Prevalence, Dental Caries, School Children, Treatment Need

INTRODUCTION

Dental caries is the most prevalent oral disease. It's very high morbidity potential has brought this disease into the main focus of the dental health profession. There is practically no geographic area in the world whose inhabitant does not exhibit some evidence of dental caries. It affects both the sexes, all races, all socio-economic status and all age groups [1]. It not only causes pain and discomfort, but also in addition, places a financial burden on the parent. The prevention of dental caries has long been considered as an important task for the health profession. Scientific research continues to make progress in identifying the best practices for diagnosing, treating, and preventing dental caries. Traditional approaches for treating carious lesions in a surgical manner are being replaced by newer strategies that emphasize disease prevention and conservation of tooth structure.

Voluminous literature exists on the status of the dental caries in the Indian population. In the year 1997, 22.7% of Indian population was estimated to be 5-14 yrs. This being such a high proportion of the population, the prevalence of dental disease among this age group needs to be assessed. It has been observed that during 1940 the prevalence of dental caries in India was 55.5%, during 1960 it was reported to be 68%. Overall the general impression is that dental caries has increased in prevalence and severity in urban and cosmopolitan population over the last couples of decades. However there is no definite picture as yet regarding the disease status in rural and backward areas of country in the comparison where 80% of the population inhabits [2].

A very extensive and comprehensive National Health Survey [3] conducted in 2004 throughout India has shown dental caries in 51.9% in 5 year-old children, 53.8% in 12 year-old children and

63.1% in 15 year-old teenagers. The report concluded that a preventive dentistry program, such as water fluoridation, should be initiated to address this national crisis in dental caries. In order to assess the magnitude of the preventive task it is necessary to know the extent and severity of the disease. Schools are the best center for effectively implementing the comprehensive health care programme, as children are easily accessible at school. The process of improving oral health in a population involves components such as

1. Collection of information about oral diseases.
2. Evaluation of the data helps to understand the need of the community.
3. Identification of the high risk group.
4. Plan the treatment and preventive strategies for community.

Not many studies have been done in Chidambaram school children to assess the dental caries and oral hygiene status. Hence the current study was planned to provide the base line data of prevalence of dental caries and the treatment needs for dental caries along with their socioeconomic status among 5 to 15 year old school going children of Chidambaram.

MATERIALS & METHODS

The study was conducted between October (2002) to March (2003). The study population consisted of children aged 5 to 15 year who were attending the school in Chidambaram. The study sample comprised of 2362 children, 1258 were boys and 1104 were girls.

The lists of school were prepared according to the information supplied by directorate of education, Chidambaram. Schools were selected randomly. There are 17 schools in Chidambaram, of which only 7 school were selected for the study, out of which 4 government and 3 private school. The age groups of 5 to 15years

Age	Male		Femal		Total	
	No.	%	No.	%	No	%
Group I 5-8 Yrs.	288	52.94%	256	47%	544	23.03%
Group II 9-11 Yrs.	428	56.02%	336	43.98%	764	32.35%
Group III 12 - 15 Yrs.	542	51.42%	512	48.58%	1054	44.62%
Total	1258	53.5%	1104	46.5%	2362	

[Table/Fig 1]: The Total Number Subject

were selected to screen the primary dentition, mixed dentition and permanent dentition except the third molar and the early status of dental caries that could not be diagnosed positively were excluded. Before starting the study official permission was obtained from all the concerned authorities. Each school principal was informed about the study aims and objectives and invited to participate in the project by a letter of explanation. An initial training and calibration exercise was conducted to provide practical experience in the study methodology and the coding system for the dental examiner prior to the main survey. All children enrolled at the preschool were given a parent introduction letter with an attached consent form. Visit to the school was made on predecided dates and all the students present on the day were examined. Children with the consent to participate in the survey were examined within their school, usually in the school corridor. Oral examinations were conducted using a disposable illuminated mouth mirror (Denlite, Welch Allyn Ltd, Navan, Co Meath, Ireland) and a blunt ball-ended probe (Diagnostic Probe, Hu-Freidy Dental, Chicago, Illinois, USA) with an end diameter of 0.5mm. All teeth were examined in a systematic manner using international FDI two-digit nomenclature to identify each primary tooth and standard dental terminology to identify each surface. An average number of 50 school children were examined per day.

A survey form was prepared and the children were examined according to the Dentition status and Treatment Needs WHO oral health assessment 1987 [4]. All the examinations were carried out by the investigator, in the subjects own surroundings i.e. the school. A recording clerk (Trained Dental Surgeon) was involved to enter the codes on the survey form. The present and past health status of each tooth was recorded in terms of the presence or absence of disease or a dental restoration. Only definite cavitations of the tooth surface were recorded as dental caries to reduce examiner confusion regarding diagnosis and exclusion of intact demineralized (white spot) lesions.

The instruments were kept in Dettol solution, for disinfections and sterilization. Dettol was diluted by adding potable water in the ratio of 1:9 dilutions. The school children were allowed to sit on a chair or stool, where sufficient natural daylight was available. The children were asked to rinse mouth thoroughly before examination, then the teeth were dried with cotton swab and the dental caries were recorded. Immediate care was given and referral was made as and when required. All the children were referred to Department of Pedodontics and Preventive Dentistry, R. M. D. C & H, Chidambaram. Survey findings were reported to respective school authorities on the spot.

Children belonging to 5-8 years were classified under group I, 9-11 years under group II and 12 – 15 years under group III. The

statistical software SPSS PC (statistical package for social science, version 4.01) was used for statistical analysis.

RESULT

Epidemiological survey was conducted for 2362 school children; belong to the age group of 5 -15 years. Out of the study population 544(23%) belong to the age group I, 764(32%) belong to age group II and 1054 (45%) belong to the age group III [Table/Fig 1]. 196(68.05%) males and 160 (62.5%) females belong to age group I showed prevalence of dental caries. 280(69.4%) males and 214 (63.7%) females belong to age group II showed prevalence of dental caries. 330(61%) males and 304 (59.4%) females belong to age group III showed prevalence of dental caries. in total, dental caries were observed in 1484(63.83%) of study population.

High			Low			Medium	
No	Affected %	Free %	No	Affected %	Free %	No	Affected %
76	68.32	31.68	84	56	44	128	81.25
44	63.64	36.36	100	57.15	42.85	112	77.14
92	57.28	42.72	124	61.57	38.43	212	71.28
64	57.16	42.84	128	68.75	31.25	148	77.78
66	46.18	53.82	262	51.53	48.47	214	82.74
52	63.84	36.16	292	52.16	4.84	168	92.25
394	59	41	990	57.8	42.2	982	80.4

[Table/Fig 2]: Comparison of proportion of affected cases among males and females.

Caries experience according to socio economic status in group I, the low socio-economic showed high percentage of caries experience males (81.2%) and females (77%). In group II, the low socio-economic showed high percentage of caries experience males (71.3%) and females (77.8%). In group III, the low socio-economic showed high percentage of caries experience males (82.7%) and females (92.3%).In all 80.4%of the student belongs low socio-economic group has showed dental caries.

High			Low			Medium	
No	Affected %	Free %	No	Affected %	Free %	No	Affected %
76	68.32	31.68	84	56	44	128	81.25
44	63.64	36.36	100	57.15	42.85	112	77.14
92	57.28	42.72	124	61.57	38.43	212	71.28
64	57.16	42.84	128	68.75	31.25	148	77.78
66	46.18	53.82	262	51.53	48.47	214	82.74
52	63.84	36.16	292	52.16	4.84	168	92.25
394	59	41	990	57.8	42.2	982	80.4

[Table/Fig 3]: Caries experience according the socio-economic status.

This table shows that in all groups the decayed teeth accounted for the greatest percentage of the total decay, missed and filled teeth. The mean (+SD) value of dmft/DMFT for group I males were 1.91±2.75 and females 3.36±3.25, group II males were 2.57±3.12 and females 2.52±2.95, group III males were 1.67±1.99 and females 1.95±1.99 [Table/Fig 2,3].

[Table/Fig 4]: Distribution on dmft/dmft component according to age and sex

Age Group	Sex	No	Decayed teeth		Missing teeth		Filled Teeth	
			No	%	No	%	No	%
Group I	M	288	524	94.93	14	2.54	14	2.54
	F	256	664	93.25	27	379	21	2.96
Group II	M	428	1060	95.32	26	2.34	26	2.34
	F	336	720	94.49	18	2.36	24	3.15
Group III	M	542	332	78.85	9	2.13	80	19.02
	F	512	326	74.43	10	228	102	23.29

[Table/Fig 4]: Distribution on dmft/dmft component according to age and sex

A total of 62.83% children required treatment, out of all groups, groups I 68% males required treatment. Among the different types of treatment required, there was no big difference between boys and girls. More cases required restoration followed by pulp care, Extraction, fissure sealant and preventive [Table/Fig 5,6].

DISCUSSION

Untreated oral diseases in children frequently lead to serious general health, significant pain, and interference with eating and lost school time. One of the factors to be considered when planning

Sex	Group I	Group II	Group III	P-Value	Significant
	Mean (SD)	Mean (SD)	Mean (SD)		
Male	1.91 ± 2.75	2.57 ± 3.12	1.67 ± 1.99	0.008(S)	I Vs II (P=0.007) II Vs III (P=0.008)
Female	3.36 ± 3.25	2.52 ± 2.95	1.95 ± 1.99	0.0001(S)	I Vs II (P=0.0002) I Vs III (P=0.0001)
Total	2.56 ± 3.07	2.55 ± 3.03	1.81 ± 1.99	0.0006(S)	I Vs III (P=0.007) II Vs III (P=0.003)

[Table/Fig 5]: The mean ± (sd) of dmft/dmft component according to age and sex

for the required growth in dental care facilities is the prevalence of dental diseases and their treatment need in the population. A World Health Organization (WHO) estimation of global DMFT for 12 year-old children reported that in the 188 countries included in their database, that on a global basis, 200,335,280 teeth were decayed, filled or missing among just that age group. This was based on the data available in 2004 from the WHO Oral Health Database, Country/Area Profile Program (CAPP)[5]. This is why WHO continues to advocate that efforts to improve the overall situation are still highly indicated (Table 2) [6],[7].

Age Group	Sex	No of Sub.	No-treatment		Treatment		Restoration	
			No	%	No	%	No	%
I	M	288	92	31.94	196	68.06	192	66.67
	F	256	96	37.5	160	62.5	184	71.88
II	M	428	148	34.58	280	65.42	214	50
	F	336	122	36.31	214	63.49	196	58.3
III	M	542	212	39.11	330	60.89	321	59.23
	F	512	208	40.66	304	59.34	314	61.33

[Table/Fig 6]: Treatment needs according to the age and sex

The 12-13 year age group were chosen for the study as it is the global monitoring age for dental caries, for international comparisons and monitoring of disease trends.(Aggeryd 1983) [8]. It was observed that the caries prevalence of group III age group was lower as compared to the group II and I. This show as age advances, the prevalence of dental caries decreases. This finding corresponds with the study conducted by Misra F.M (1979) [9] among 6-16 year old children in urban area of South Orissa. He observed an increase in caries level between 5 to 12 year (56% to 81%) and a decrease in caries level in 13-15year (41.4%).Similarly in the study conducted by Peterson P.E,et al (1991) [10], Retna Kumari N (1999) [11], Dash J.K (2002) [12], Saravanan S.,et al (2003) [13], Mahesh Kumar P(2005) [14]. The increased prevalence of caries in boys compared to girls confirms the view that there is a marked preference for sons regardless of the socio-economic

S. No.	Author's Name	Year	Country	% of dental caries	DMFT/DMFS
1	A.A. Khan	1986	India	60-65%	-
2	Rabinder Kaur	2010	India	63.2%	2.9(16-18) 3.26(19-21)
3	Al Khatab	1990	Irish	72%	-
4	Nodzack M	1990	Warsaw	25%	-
5	Ismail Al	1990	Quebec	28%	-
6	Sullivan A	1990		20-26%	-
7	Redianna TC	1990		72%	-
8	Tpdd R	1990	Vietnam	100%	8.3
9	Sullivan A	1990		26%	-
10	Ricman A	1990	Finland	96%	-
11	Brunell AJ	1990	US	50%	1.1
12	Dummer PM	1990		87%	4 5.67
13	Frenchen JE	1990	Tanzania	27%	
14	Alaiiusa S	1990		62%	
15	Gordan M	1990	Israel	76%	
16	Atwood	1990	Athens	74%	2.2
17	Sicillia A	1990	Spain	42.1%	1.5
18	Chikte UM	1990	Transkei	53%	
19	Laher MH	1990	Bangladesh	64%	2.7
20	Sevevy	1990	Cape Verde	89.6%	
21	Stadeler	1991	Styria	87.6%	6.4
22	Peterson P.E.	1991	Madagascar	64%	5.6
23	Adelo-Yokoc	1991	Ghana	22%	
24	Del Rio Gomez	1991	Mexico	82%	5.76
25	Luoma A	1991	Finland	62%	
26	Cohan s	1991	Ethiopia	90%	
27	Gulzao HJ	1992	Hembland	80.4%	
28	Maher R	1992	Pakistan	55%	
29	Al Khateeb	1992	Saudi Arabia	76%	
30	Zadik D	1992	Israel	73.3%	
31	Saemundaam SR	1993	Iceland	35%	
32	Alkpata	1993	Riyadh	69%	
33	Raadal M	1993	Sudan	45%	2.25
34	Nglanla PM	1993	Kenya	52%	
35	Jalili VP	1993	India	27%	

S. No.	Author's Name	Year	Country	% of dental caries	DMFT/ DMFS
36	Rao SP	1993	India	22.8%	
37	Truin	1993	Netherland	68%	
38	Yankilevich E.R.	1993	Netherland	37%	
39	Cleaton-Jones P	1994	S. Africa	35%	3.82
40	Pitts NB	1994	Great Britain	67%	
41	Bhowate RR	1994	India	53.50%	
42	Downer M.C.	1994	UK	72%	
43	Salaras-Wage MH	1994	Spain	62%	2.65
44	Zusman S.P.	1995	Israel	71%	2.7
45	Holdr. D	1995	UK	52%	
46	Kalsbeck H	1996	Netherland	40%	
47	Alekrejuiene	1996	Lithuania	76%	4.2
48	Vigilid M	1996	Kuwait	30%	
49	Zoitopolous	1996	London	45%	
50	Van Palestein Heldeman WH	1996	Bangladesh	62%	1.7
51	Doladol	1996	Barcelona	52%	1.37
52	Majd Z.A	1996	Malaysia	82.2%	
53	Miyaraki H	1996	Japan	62%	3.64
54	Spleith C	1996	Germany	52%	
55	Chakrobarty M	1997	India	57.47%	
56	Rodrigues JS	1998	India	68.2%	
57	Machiulskiene V	1998	Lithuania	99.7%	15.8
58	Ismail M	1998	Labrodor	88%	
59	Lin YT	1998	Lanya Island	94.5%	
60	Lopex Dell Vell	1998	Pureto Rico	63.6%	
61	Retnakumar N	1999	India	68.5%	2.73
62	Kurakosi S	1999	India	57%	
63	Rao S	1999	India	76.9%	0.78
64	Singh A.A	1999	India	39.4%	1.03
65	Irigoyen	1999	Mexico	70%	2.78
66	Loec	1999	China	53%	2.78
67	Pittis N.B.	2000	UK	53%	1.17
68	Tapaoba H	2000	Burkinafaso	50%	1.72
69	Cuellar Gonzalez	2000	Mexico	22.1%	0.71
70	Yao KJ	2001	Coted'Ivoire	77.2%	
71	Tralbat JL	2001	Brazil	54.7%	1.46
72	Vanoobegenn J	2001	Belgium	44%	4.1
73	Wong MC	2001	China	80%	6.5
74	Montero MJ	2002	Conneticut	38%	3.1
75	Mengini G	2002	Winerthur	21%	
76	Dash JK	2003	India	64.3%	2.38
77	Yeer	2003	Nepal	67%	3.3
78	Wan H	2003	Sichuan	36.46%	
79	Paul TR	2003	Saudi Arabia	84.55%	7.1
80	Jamieson LM	2003	Fijj	68.7%	6.76
81	Chaffin JG	2003	Michigan	50%	1.1
82	Archilla L	2003	Gantemalam	90%±	6.1

S. No.	Author's Name	Year	Country	% of dental caries	DMFT/ DMFS
83	Elias-Boneta	2003	Puerto Rico	81%	6.5
84	Christensen LB	2003	India	57%	1.6
85	Wang WJ	2003	Beijing	85.4%	
86	Cote S	2004	USA	49.3%	
87	Pieper I.C.	2004	Germany	45.7%	
88	Vanwyk	2004	S. Africa	61.7%	
89	Bourguoiswe M	2004	France	4.5%	
90	Seibett. W	2004	USA	73%	
91	Peressini	2004	Manitoulin	96%	6.2
92	Cosic K	2005	Denmark	33%	
93	Muwazi LM	2005	Uganda	52.7%	
94	David J	2005	India	27%	
95	Yabao RN	2005	Philippines	71.7%	
96	Herrea Midel S	2005	Nicargua	72.4%	
97	Sudha P	2005	India	72.6%	
98	Mormemi A	2006	Iran	36.2%	0.38
99	Campus G	2006	Sardinia	36%	
100	Moreira PV	2006	Brazil	51.9%	
101	Schlute AG	2006	Germany	39.3%	
102	Agbelusi GA	2006	Nigeria	24.6	
103	Ferrazzanno GF	2006	Campania	81%	
104	David J	2006	Europe	83%	
105	Dua V	2007	India	46.7%	
106	Travin GJ	2007	Hague	60%	
107	Coyola AP	2007	Pontigo	48.6%	
108	Ahmad NA	2007	Baghdad	62%	1.8
109	Umesi Koloso	2007	Nigeria	76.2%	
110	Patro Bic	2008	India	82.4%	
111	Licr	2008	India	82.4%	
112	Gomez SantroG	2008	Spain	61.3%	
113	Sarvanan S	2008	India	61.3%	
114	Bao L	2008	China	43.2%	
115	Zhang L	2008	China	75.2%	
116	Hammisi J	2008	Iran	75.5%	
117	Zukanovii.A	2008	Herzegovinia	91%	
118	Gowda SS	2009	Northland Itai Tai	88%	
119	Grewal	2009	India	77.7%	1.97
120	Dhar.V	2009	India	63.20%	
121	Simratvir.M	2009	India	52.7%	
122	Aaud.V	2009	Brazil	78%	
123	Sgan Cohen HD	2009	Jeruseleum	43%	
123	Karim A	2009	India	85%	
124	Machulskieve V	2009	Lithuania	100%	
125	Han DH	2010	Korea	65%	2.26
126	Van Wyk	2010	S. Africa	41.7%	1.17
127	Lewin K	2010	Scotland	42%	
128	Johansson	2010	America	18.8%	
129	Perez-Domiguez	2010	Spain	66.9%	
130	Cadanid	2010	Coloumbia	74.9%	
131	Hashim R	2010	Ajman	76%	

S. No.	Author's Name	Year	Country	% of dental caries	DMFT/DMFS
132	Masson LF	2010	Scotland	56%	
133	Jamelli SR	2010	Brazil	71.8%	2.9

[Table/Fig 7]: Table showing author contribution

class, which manifests itself in the longer feeding of sons compared to daughters Jain M (2001) [15]. A cross sectional study [19] with 3,048 children aged 6-12 years in Mexico was reported in 2006. Mean age was determined to be 8.81 years with a primary dentition caries prevalence of 90.2%. In the permanent dentition, Caries prevalence was reported to be 82%. The majority of the children (81.1%) needed restorations of at least two toothsurfaces. Caries incidence increased with age [16] [Table/Fig 7].

The prevalence of dental caries was high in the low socio-economic status because of their poor oral hygiene practice, lack of awareness, improper food intake and family status. This finding is similar to the study conducted by Sogi G and Baskar D.J (2001) [17]. Recent studies from Europe 4, 522 demonstrate a significant inverse association between social class and oral health status in young children. The north Brisbane study supports these findings by confirming that preschool children from a lower socio-economic background also more active decay and more missing teeth from previous disease compared with children from higher SES levels. In the present study, the decay teeth accounted for the greatest percentage 92% of the dmft/DMFT component, finding is similar to the studies of Olojugba O.O, et al (1987) [18] and Prodrigues J.S.L & Damle S.G(1998) [19].

On assessment of treatment needs, among the III groups, group I aged 5-8yrs old were high treatment needed, similar to the study done by Dhar V., Jain A., Van Dyke T.E., Kohli A(2007) [20] and Dhar V, Bhatnagar M (2009) [21]. The highest need I all III groups were of restoration followed by pulp care. Between the two sexes, boys showed a decline in treatment needs. This could suggest that boys were getting a preference for receiving dental treatment compared to girls. Rao A, Sequeira SP, Peter S (1999) [22]

The result of this study is a pointer to the fact that there still exist a large segment of the population who continue to remain ignorant about the detriment effects of poor oral health and the multiple benefits enjoyed from good oral health. One of the oral health goals advocated by WHO for 2000 AD [23] was that 50% of 5-6 year olds should be free from dental caries. In the present study it was observed that 57.2% of children in 6 year age group were affected by dental caries indicating a high prevalence of the disease in children.

P.S: The above studies are an accumulation of dental caries studies over a period of 20 years (from 1990-2010) and involving the age group 5-17 years.

REFERENCES

- [1] Prakash H, Sidhu SS & Sundaram KR: Prevalence of Dental Caries among delhi school children. J Ind Dent Assoc.1999; 70:12-14.
- [2] Damle SG, Patel AR. Caries prevalence and treatment needs amongst children at Dharavi, Mumbai. J Comm Dent Oral Epidemiol.1994; 22:62-3.
- [3] National Oral Health Survey and Fluoride Mapping. An Epidemiological Study of Oral Health Problems and Estimation of Fluoride Levels in Drinking Water. Dental Council of India, New Delhi, 2004; 32; 67-78.
- [4] World Health Organization: oral health surveys basic method. 4th edition, Geneva, WHO 1987;760-871
- [5] Bratthall, D. Estimation of global DMFT for 12-year olds in 2004. Int Dent J. 2004; 55:14-18.
- [6] World Health Organization. Global oral health data bank. Geneva, 2001; 768-771.
- [7] Moynihan P, Petersen PE. Diet, nutrition and the prevention of dental diseases. Public Health Nutr. 2004; 7:201-226.
- [8] Aggeryd T.Goals for oral health in the year 2000:Co-operation between WHO, FDI and national dental associations.Int Dent J. 1983;33:55-69.
- [9] Misra FM & Shee BK: Prevalence of dental caries in school going children in an urban area of South Orissa. J ind Dent, Assoc.1979;51: 267-270.
- [10] Petersen P.E, Pulsen V.J, Ramalhaleo J and Ratsifaritara C: Dental caries and dental health behavior situation among 6 and 12year urban school children in Madagascar. Afr. Dent. J.1991; 5:1-7.
- [11] Retna Kumari N: Prevalence of dental caries and risk assessment among primary school children of 6 – 12 year old in the Varkala municipal area of Kerala. J Indian Soc Pedo Prev Dent.1999;17(4):135-142.
- [12] Dash JK, Sahoo PK & Bhuyan SK: prevalence of dental caries and treatment needs among children of cuttack (Orissa). J Ind Soc Pedo Prev Dent.2002;20(4): 134-144.
- [13] Saravanan S, Anuradha KP, and Bhaskar DJ Prevalence of dental caries and treatment needs among school going children of Pondicherry. J Indian Soc Pedo Prev Dent. 2003;21(1):1-12.
- [14] Mahesh Kumar P, Joseph T, Varma RB, Jayanth M. Oral health status of 5 years and 12 years school going children in Chennai city: An epidemiological study. J Indian Soc Pedo Prev Dent. 2005; 23:17-22.
- [15] Jain M. Save our future mothers. Indian J Prev Soc Med 2001;32:89-90.
- [16] Villalobos-Rodelo JJ, Medina-Solis CE, Molina-Frechero N, Vallejos-Sánchez AA, Pontigo-Loyola AP, Espinoza-Beltrán JL. Dental caries in school children aged 6-12 in years in Navolato, Mexico: Experience, prevalence, severity and treatment needs. Biomedica. 2006; 26:224-233.
- [17] Sogi G and Baskar D.J: Dental caries and oral hygiene status of 13-14 year old school children of Davangere. J Indian Soc Pedo Prev Dent. 2001;19(3):113-117.
- [18] Olojugba O.O and Lannox M.A: Dental caries experience in 5 and 12 year old school children in Ondo State. Nigeria in 1977 and 1983. Community Dent. Health.1987; 4:129-135. [19] Prodrigues JSL & Damle SG: Prevalence of dental caries and treatment need in 12-15 year old municipal school children of Mumbai. J Indian Soc Pedo Prev Dent.1998; 16(2): 31-36.
- [20] Dhar V, Jain A, Van Dyke TE, Kohli A. Prevalence of dental caries and treatment needs in the school going children of rural areas in Udaipur District. J Indian Soc Pedo Prev Dent 2007; 25:119-121.
- [21] Dhar V, Bhatnagar M. Dental caries and treatment needs of children (6-10 years) in rural Udaipur, Rajasthan. Indian J Dent Res. 2009; 20: 256-60.
- [22] Rao A, Sequeira SP, Peter S. Prevalence of dental caries among school children of Moodbidri. J Indian Soc Pedo Prev Dent. 1999; 17: 45-8.
- [23] World Health Organization. Global oral health data bank. Geneva, 2001.

AUTHORS:

1. Joyson Moses: MDS, Reader, Department of Pedodontics, Thai Moogambigai Dental College and Hospital, Chennai
2. B N Rangeeth: MDS, Senior Lecturer, Department of Pedodontics, Thai Moogambigai Dental College and Hospital, Chennai
3. Deepa Gurunathan: MDS, Department of Pedodontics, College of Dental Surgery, Saveetha University, Chennai

NAME, ADDRESS, TELEPHONE, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Joyson Moses, MDS, Z block, 58 Anna Nagar, Chennai - 600040, Ph: 94441788136, E. mail: drjoysonm@gmail.com

DECLARATION ON COMPETING INTERESTS: No competing Interests.

Date of Submission: XXXX
Peer Review Completion: XXXXX
Date of Acceptance: XXXXXX
Date of Publication: XXXXXX

