Original Article

Dental Caries prevalence among rural middle school children of Tamil Nadu by teachers' screening and camp approach

Rajendran A K[1*], Keshav Singh[2], Arumugam P[3]

[1]Professor and HOD, [2]Associate Professor, [3]Professor of Biostatistics, Department of Community Medicine, Sri Muthukumaran Medical College and Research Institute, Chennai-600 069, Tamil Nadu, INDIA.
Email: akrajendran@rediffmail.com, drkessingh@gmail.com, pitchaiarumugam47@gmail.com

Abstract

Background: Dental caries not only damages teeth but also a forerunner of many health problems in young children and it needs to tackle at the earliest. Since majority of the affected school children, Govt. decided to involve their teachers in primary dental screening before arranging dental camps as a part of school health program. Aim: To find out the prevalence of dental caries among rural schoolchildren by two approaches. Objectives: 1. screening by trained respective schoolteachers. 2. Organizing dental camps by experts. 3. Comparing the two approaches and make suggestions for improvement. Methodology: TN comprises of 42 health unit districts and 385 community blocks. Health units from each block selected one Govt. middle school. Trained Teachers screened and dental camps confirmed the screening for further management. Results: Out of175525 screened, teachers identified 84604 (48.2%) with dental problems. Among them 34850(19.86%) had caries of milk teeth and 33059 (18.83%) had caries of permanent teeth. Besides 16695 (9.5%) had other dental problems. The dentist identified 92.3% as dental caries in the camps. As a part of school health program special dental camps were arranged to tackle these cases, with facilities for either extraction (or) filling up of teeth cavities. Out of 145604 children attended in the camps 94587 (64.5%) were treated for caries 39858 (27.4%) were referred to district hospital. Extractions were done only for milk teeth with parental consent. Among the treated group 18639 (12.8%) children had extraction of caries teeth, 75949 (52.16%) had filling up of teeth (milk teeth 55539 (38.14%) and permanent teeth 20410 (14.25%)) with glass ionomercement. Among the referred children 14850 (10.2%) had caries of permanent teeth and 25008 (17.18%) had other dental problems apart from caries. Conclusion: Primary screening by schoolteachers and further management by dentist has yielded very good results in identification of dental problems as well as treating 70%. To find out the prevalence of dental problems in schoolchildren, in the beginning of academic year special dental camps recommended.

Key Words: Schoolchildren, Dental caries, Teachers screening, Dental camps:

[*]**Address for Correspondence:**
Dr. A.K. Rajendran M.D., Professor and HOD, Department of Community Medicine, Sri Muthukumaran Medical College and Research Institute, Chikkarayapuram, Mangadu, Chennai-600 069
Email: akrajendran@rediffmail.com
Received Date: 07/05/2016 Revised Date: 12/06/2016 Accepted Date: 08/07/2016

Access this article online

Quick Response Code:

Website: www.statperson.com

DOI: 18 July 2016

INTRODUCTION

A current review of the available epidemiological data from many countries clearly indicates that there is a marked increase in the prevalence of dental caries in the developing nations. This global increase in dental caries prevalence affects children as well as adults, primary as well as permanent teeth, and coronal as well as root surfaces. The dental caries being one of the most common chronic diseases of childhood (6-12 years)[1]. This increase in dental caries signals a pending public health crisis[2]. Dental caries is a disease with multi factorial cause[3]. The prevalence and incidence of dental caries in a population are influenced by a number of risk factors, such as age, sex, ethnic group, dietary patterns and oral hygiene

How to site this article: Rajendran A K, Keshav Singh, Arumugam P. Dental Caries prevalence among rural middle school children of Tamil Nadu by teachers' screening and camp approach. *International Journal of Recent Trends in Science and Technology*. July 2016; 19(3): 459-463. http://www.statperson.com (accessed 20 July 2016).

habits. There is no doubt that dietary and oral hygiene habits are affected by income, education and social environment. Among various stages of life, the school going period is the crucial one where the children are facing multi dimensional challenges in terms of educational and health perspective risks which leads to various morbidity conditions especially oral diseases. The major oral health problems around the world are generally considered to be dental caries and periodontal disease. In 1940, the prevalence of dental caries in 5 and 12-year-old schoolchildren in India were 55.5% and it jumped to 68% in the 1960[4,5] and climbed to 89% in subsequent years [6]. A very extensive and comprehensive National Health Survey[7] was conducted in 2004 by the Dental Council of India, throughout the entire country in order to ascertain the oral health status and prevalence of dental disease in representative age groups. The following percent prevalence of dental caries was reported for the various age groups examined, for both coronal and root surfaces as 51.9% in 5 year-old children, 53.8% in 12 year-old children, 63.1% in 15 year-old teenagers, 80.2% in adults aged 35-44 years-old, and 85.0% in adults aged 65-74 years-old . The report concluded to provide preventive dentistry program, such as water fluoridation, dental health education, early diagnosis and treatment etc..

Tamil Nadu has a school health program in which one component is training of school teachers for periodical screening of school children for various ailments like skin diseases, vision problems, dental disease etc., (to be followed by subsequent referral) They have to impart health education to adopt and maintain hygienic practices so as to prevent these ailments. It has a well-developed dental health services in the district head quarters hospital which conduct need based health camp periodically. This study aims to identify whether the training is beneficial in identifying the dental problems and to know about the prevalence of dental caries and the role of health camps in alleviating them.

METHODOLOGY

Tamil Nadu has 42 health unit districts and 385 blocks. It has a well-organized dental unit in each districts hospital. As a part of the dental health program, decided to conduct a dental camp in each block with in a period of one month and cover the as much children as possible. One government school was selected in each block at random. All the students of third to eight standard (Children in the age group of 8 to 13) were included in the screening two teachers from each school were trained by the dentist to screen and select the students affected with dental caries and other dental problems for further management. The teachers have to screen their students one week prior to the camp and bring the selected children to the camp. Each such organized camp two dentists and one dental assistant were involving with necessary equipments for filling up and extraction of the teeth.

Each school has two or three sections in each standards (III to VIII std) and roughly 60 to 90 students were selected each standard in school. Accordingly, the teachers screened 175725 students. The teachers identified only 84604 students were having dental problems. Apart from that as the dental caries was most common, all other identified dental caries students have also attended the camps. Besides the camps have attracted more students because of the availability of specialist and services altogether 145065 students attended the camp.

Data Analysis

The screening data of teachers were compared between the gender of the students in respect of dental problems and teeth wise cavity. The significance was tested by χ^2 (Chi-square test). The teachers screened data were compared with the dental camps data by using the 'Z' test of proportion to find out the significance. The P-values less than or equal to 0.05 ($P \leq 0.05$) were considered as statistically significant.

RESULTS

Screening test findings

The trained teachers have screened 175525 students among them 48.2% had dental problems and the remaining 51.8% did not have any problems. The dental problems compared between the genders of the students.

Table 1: Teachers screened dental problems compared between the genders of the students

Gender	Screening test findings						χ^2	df	Sig
	Dental problems		No problems		Total				
	No	%	No	%	No	%			
Boys	43501	24.8	45521	25.9	89022	50.7			
Girls	41103	23.4	45400	25.9	86503	49.3	31.985	1	P<0.001
Total	**84604**	**48.2**	**90921**	**51.8**	**175525**	**100.0**			

The table -1 states the comparison of dental problems between the genders of students screened by the teachers. The boys (24.8%) were having dental problems and the girls (23.4%) were having the dental problems. The difference between them was statistically very highly significant (P<0.001).

Table 2: Teachers screened dental caries compared between the genders of the students

Gender	Screening test findings						χ^2	df	Sig
	Dental caries		Other problems		Total				
	No	%	No	%	No	%			
Boys	35302	41.7	8199	9.7	43501	51.4			
Girls	32607	38.6	8496	10.0	41103	48.6	44.303	1	P<0.001
Total	**67909**	**80.3**	**16695**	**19.7**	**84604**	**100.0**			

The dental caries of students reported in screening test was compared between the genders in the table-2. In respect of dental caries, 41.7% of boys and 38.6% of girls were having the dental caries. The difference between the boys and girls was statistically very highly significant (P<0.05).

Table 3: Teachers screened dental caries compared between the genders based on the teeth type

Gender	Dental caries in type of teeth						χ^2	df	Sig
	Milk teeth		Permanent teeth		Total				
	No	%	No	%	No	%			
Boys	18023	26.5	17279	25.5	35302	52.0			
Girls	16827	24.8	15780	23.2	32607	48.0	2.065	1	P>0.05
Total	**34850**	**51.3**	**33059**	**48.7**	**67909**	**100.0**			

The teeth wise dental caries of students reported in screening test was compared between the genders in the table-3. In respect of dental caries, 26.5% of boys and 24.8% of girls were having the milk teeth dental caries and 25.5% of boys and 23.2% of girls were having the permanent teeth dental caries. The difference between the teeth wise dental caries of boys and girls was not statistically significant (P<0.05) indicating that the both were affected equally.

Dental Camps findings

Experts to confirm the dental problems compared the screening test findings with dental camps findings.

Table 4: Comparison and confirmation of screening test findings with dental camps findings:

Type	Problems		No Problems		Total		'Z'	Sig
	Fre	%	Fre	%	Fre	%		
Screening test	84604	48.2	90921	51.8	175525	100.0	319.049	P<0.001
Dental camps	134445	92.3	11159	7.7	145604	100.0		

The above table -4 states the comparison of screening test and dental camps findings. In the screening test, 48.2% of students were reported as having dental problems and in the dental camps, 92.3% of students have dental problems. The difference of findings between the two was statistically very highly significant (P<0.001). This is mainly because of the camps attracted more children with dental problems. Certainly, the camp has created a public interest there by making parents to bring their children and get treatment.

Table 5: Type of dental cavities treatment and referral of other problems in dental camps:

Treatment	Milk teeth		Permanent teeth		Other problems		Total	
	Fre	%	Fre	%	Fre	%	Fre	%
Extraction	18638	13.9	Nil	0.0	Nil	0.0	18638	13.9
Filling	55809	41.5	20140	15.0	Nil	0.0	75949	56.5
Referred	Nil	0.0	14850	11.0	25008	18.6	39858	29.6
Total	**74447**	**55.4**	**34990**	**26.0**	**25008**	**18.6**	**134445**	**100.0**

The treatments for dental cavities were stated in the above table-5. Among the 74447 of milk teeth 18638 (13.9%) and 55809 (41.5%) were extracted and filled up respectively. The permanent teeth caries was 26.0%. Out of them20140 (15%) teeth were filled and 14850 (11%) were referred. The remaining 25008 children (18.6%) were referred with other problems to district hospital for further managements.

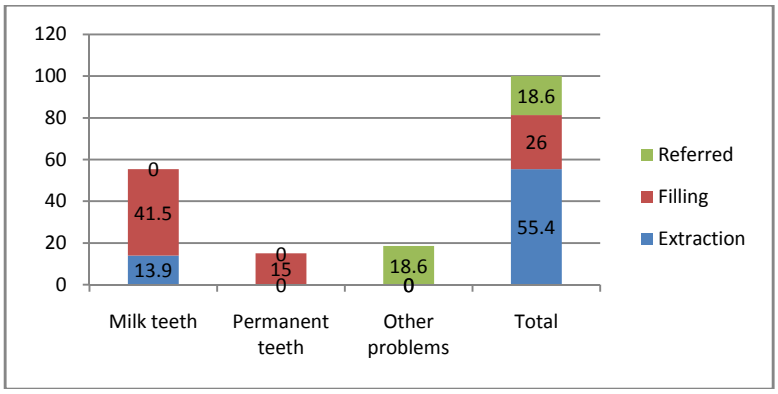

Figure 1: Percentage distribution of dental camps treatments and referral activities with type of teeth

DISCUSSION

Present study has found out the prevalence of dental problems among the school children (8 – 13 years) rural Tamil Nadu is 48.2% (out of 175525 children 84604 were identified with dental problem) mostly constituting of dental caries. This was achieved by simple screening alone by school teachers. Two factors favored this huge outcome. One, the teachers are well educated and they can easily be trained and next, the dental problems can easily be seen – change of the colour of the teeth, dark appearance of the cavities, abnormal shape of teeth. In a study by Shingare *et al.*[8]in Maharashtra, reported the prevalence of dental caries among 3-14 years old children to be 80.92% which is higher than reported in the present study. Dixit *et al.*[9]conducted a study among school children in Nepal and they found that the prevalence of dental caries among the school children aged 12-13 years was 41% which is just below the prevalence in the present study. In Kenya, Ng'ang'a and Valderhaug[10] reported a prevalence of 40-50% among children aged 13-15 years. Another study was conducted by Kassim *et al.*[11] in Nairobi in 2006 which revealed that the prevalence to be 43% among rural children. Navin Anand[12] has reported in this study in Bhadalpur the prevalence of dental caries were found by 53% .

However, The prevalence of dental caries in the present study was found 48.2% which is close to the reported caries prevalence of India (i.e. 53.8%) in National Oral Health Survey[13]**.** Almost similar caries prevalence has been reported by Das *et al***.**[14]. Rodrigues and Damle[15] and Shourie[16].

In our study, the prevalence of the dental caries was higher in boys (41.7 %) than in girls (38.6%). Even though the numbers seen to be equal the difference is statistically highly significant indicating higher prevalence in boys. But some other studies contradicted where girls are having more dental caries and some others has shown that there is no difference in the prevalence. Dixit *et al.*[9]also reported a higher prevalence among girls (48.4%) than in boys (32%) although the overall prevalence in their study was lower than in present. In addition, Abdul Arif Khan[17] in Gwalior found a slightly higher number of caries girls (P=0.510) in comparison to boys (P=0.490). Gathecha *et al.*[18] revealed that the difference of prevalence of dental caries between boys and girls are not significant. Whatever the variations the absolute numbers appear to be huge in both the sexes and hence they have to be immediately attended.

The analysis of the dental caries according to the type of teeth (Milk teeth and permanent teeth) has shown that there was no difference in the affected rates. That means both types of affected teeth were equal in both the sexes. Usually the parents have the notion that milk teeth are going to be shed anyway and new teeth will replace them and hence they ignore the caries of the milk teeth. But the fact is that the affected milk teeth not only cause problems like tooth ache, sepsis etc., they lead to upcoming teeth also getting slowly eroded invariably and the caries developed in them and hence the caries in the milk teeth should also be taken seriously.

Analysis of activities done in the camp clearly proved the benefits from this approach. Not only the dental problems were identified, dental extraction were also done (for milk teeth) at the camp itself (Totally 18638 -13.9% got benefited). Not only that the cavities were filled up in 75949 teeth (56.5%) will glass ionomer cement and further damage to teeth was arrested, as the remaining 39858 children (29.6%) were referred to district hospital for appropriate management.

CONCLUSION

The study indicated that the school teachers well trained were able to identify the students with dental problems effectively and refer them for appropriate management. To narrow the gap between teachers screening and dental camps, the screening program may be strengthened. Even though this can be done periodically, informing the parents to remedy the

problems, the parents are not ready to take the children to district hospital on their own. Nevertheless, if the camps are arranged at the suitable date and in a convenient place they were willing to bring the children for the treatment. Hence, here the camp approach proved very effective, attracting more number of affected children. Not only that 70% of the children with dental problem have got the treatment at the camp site itself (extraction of teeth and filling up of the cavity with sealants). Only the 30% remaining were referred to the districts hospital thus reducing the load at the districts center. If such an activity is done every year especially in the month of June or July after the admission of the new students definitely the dental problems in the children can be curtailed at the earliest. In addition, it will go a long way in reducing the dental problems in India improving health of the younger generations.

ACKNOWLEDGEMENT

The authors acknowledged the State Health Society for utilizing their data published in the website

REFERENCES

1. http://www.who.int/mediacentre/factsheets/fs318/en/.
2. Sohi RK, Gambhir RS, Veeresha KL, Randhawa AK, Singh G. Assessment of prevalence of dental caries among 5 and 12-year-old schoolchildren in Chandigarh (U.T), India. Arch Oral Res. 2012;8(1):39–45.
3. Campus G, Sacco, G, Cagetti M, Abati S. Changing trend of caries from 1989 to 2004 among 12-year old Sardinian children. Bio Med Central Public Health. 2007; 7:28.
4. Damle SG, Patel AR. Caries prevalence and treatment needs amongst children at Dharavi, Mumbai. Community Dent Oral Epidemiol. 1994;22(1):62–63.
5. Dash JK, Sahoo PK, Bhuyan SK, Sahoo SK. Prevalence of dental caries and treatment needs among children of Cuttack (Orissa) J Indian Soc Pedod Prev Dent. 2002; 20(4):139–43.
6. Joshi N, Rajesh R, Sunitha M. Prevalence of dental caries among school children in Kulasekharam village: a correlated prevalence survey. J Indian SocPedodPrev Dent. 2005;23(3):138–40.
7. Dental council of India. New Delhi: 2004. National oral health survey and fluoride mapping. An epidemiological study of oral health problems and estimation of fluoride levels in drinking water.
8. Shingare P, Jogani V, Sevekar S, Patil S, Jha M (2012) Dental caries prevalence among 3-14 years old school children, urban, Raigad district, Maharashtra. J Contemp Dent 2: 11-14.
9. Prasai Dixit L, Shakya A, Shrestha M, Shrestha A (2013) Dental caries prevalence, oral health knowledge and practice among indigenous Chepang school children of Nepal. BMC Oral Health 13: 20.
10. Ng'ang'a PM, Valderhaug J (1992) Dental caries in primary school children in Nairobi, Kenya. ActaOdontolScand 50: 269-272.
11. Kassim BA, Noor MA, Chindia ML (2006) Oral health status among Kenyans in a rural arid setting: dental caries experience and knowledge on its causes. East Afr Med J 83: 100-105.
12. NavinAnand Ingle, Harsh Vardhan Dubey, Navpreet Kaur, and Rahul Gupta Prevalence of dental caries among school children of Bharatpur city, India J IntSocPrev Community Dent. 2014 Jan-Apr; 4(1): 52–55.
13. National oral health care program implementation strategies, Project of DGHS, MOH and FW. Govt. of India, submitted by Hari Prakash and Naseem Shah, Department of Dental Surgery, AIIMS, Ansari Nagar, New Delhi. 2004.
14. Das UM, Beena JP, Azher U. Oral health status of 6- and 12-year-old school going children in Bangalore city: an epidemiological study. J Indian SocPedodPrev Dent 2009;27:6-8
15. Rodrigues S, Damle SG. Prevalence of dental caries and treatment needs in 12-15 years old Municipal School Children of Mumbai. J Indian SocPedodPrev Dent 1998;2:31-6.
16. Shourie KL. Dental caries in children in Madras city in relation to economic and nutritional status. J Medical Res 1942;30:561-72
17. Abdul ArifKhan,Sudhir K. Jain, and Archana Shrivastav Prevalence of Dental Caries among the Population of Gwalior (India) in Relation of Different Associated Factors
18. Gathecha G, Makokha A, Wanzala P, Omolo J, Smith P (2012) Dental caries and oral health practices among 12 year old children in Nairobi West and Mathira West Districts, Kenya. Pan Afr Med J 12: 42.

Source of Support: None Declared
Conflict of Interest: None Declared