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ORIGINAL ARTICLE

Dental Caries Experience Among Pre-School Children Of Udupi Taluk, Karnataka, India

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ABSTRACT

Aim: To determine the dental caries experience of pre-school children attending anganwadi and day care centre in Udupi Taluk.

Materials and Methods: A cross-sectional survey was conducted on 825 pre-school children attending Anganwadi and day care centers in Udupi Taluk. Dental caries was assessed using Dentition status and treatment needs (WHO, 1997). Data was analyzed using SPSS 16.0 with significance level at P value < 0.05. Chi-square test was used to find out the significant differences. Level of significance was taken

Results: Dental caries experience was significantly higher among anganwadi children (3.74 ± 3.58) as compared to day care children (3.26 ± 3.32). The prevalence of dental caries was 64.2% among anganwadi children and 61.0% among day care children. Girls had slightly higher mean deft score, mean number of decayed teeth, filled teeth and lower missing teeth as compared to boys.

Conclusion: High caries experience in this study revealed that there is a great need to plan and conduct oral health promotion initiatives and treatment activities for preschool children. The oral health education at initial stages would help in improving preventive dental behavior and attitude which is beneficial for lifelong.

Keywords: Dental Caries Experience, Children, Pre-School, Caries

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INTRODUCTION

Oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world. According to the World Oral Health Report 2003, dental caries and periodontal diseases are the two globally leading oral afflictions (1). Dental caries remains the most important childhood disease affecting a considerable proportion of young children worldwide. It is one of the most common unmet health care needs of children especially in preschool children (2).

There is a dearth of information on the oral health of 3-5 years old preschool children in India. Oral health surveys have focused mainly on primary or secondary school children. Pre-school period is the time when deleterious oral habits, caries patterns and risk factors establish. Preschool children's age group provides the earliest opportunity where a comprehensive clinical examination is possible. By this stage, most children have a full complement of primary teeth and have established dietary habits. The caries experience in deciduous dentition is a strong predictor for cariogenic breakdown of the mixed and permanent dentition (3).

The control of dental caries in infants and young children is a continuing problem and it will be easy to manage if groups of population with greatest needs are identified. So it is very important to identify high risk group

pre-school children with primary decay which is useful to determine the treatment needs and to implement preventive procedures in those children. Several prevalence studies have been reported but not much recent data is available on the dental caries experience of pre-school children of Karnataka particularly in Udupi Taluk. Hence an attempt has been made to determine the dental caries experience of pre-school children aged 3-5 years going to anganwadi and day care centre in Udupi Taluk.

MATERIALS AND METHODS

A cross-sectional survey was conducted among pre-school children attending Anganwadi and day care centers in Udupi Taluk located in southwestern part of Udupi District, Karnataka, India. There are a total of 510 Anganwadis in Udupi Taluk. The Anganwadis are under the Department of Women and Child Development and the Child Development Project Officer (CDPO) is in-charge of one Taluk. In urban areas, non-formal preschool education is provided in day care centres, kindergarten classes, nursery schools and play schools etc. So, the list of Anganwadis and Day care centres in Udupi Taluk was obtained from CDPO. The anganwadi schools and day care centre were selected randomly. By using the cluster sampling, all the eligible children in the selected Anganwadi and Day care centre present on the day of examination were included in the study.

Before conducting the study, ethical clearance was obtained from Ethics Committee, Kasturba Hospital, Manipal. The official permission for examination was obtained from all the concerned authorities i.e CDPO, Class teacher. Voluntary written informed consent was obtained from parents of the children participating in the study before the clinical examination.

Pre-school children in the age group 3-5 years were selected from both genders and from varied socioeconomic background. A total of 825 pre-school children participated in the study. The children were examined by single examiner who was trained to record the WHO oral health assessment form to avoid inter-examiner variations. The subjects were examined on an upright chair in adequate natural light in the premises of school using the autoclaved instruments. Each tooth surface was examined by using plain mouth mirror and WHO probe. Clinical assessment of dental caries was done by Dentition status and treatment need (WHO Oral Health Assessment Form, 1997) (4) using dentition status part only and decayed, missing and filled teeth were calculated from the information.

STATISTICAL ANALYSIS

The data obtained was entered into the data sheet and statistically analyzed using SPSS software version 16.0. Descriptive statistics that included mean, standard deviation and percentages were calculated for each group. Student "t" test was used to find out significant differences in mean deft between groups. Categorical data were analyzed by Chi-square test for differences between groups. Significance for all statistical tests was predetermined at a probability value of 0.05 or less.

RESULTS

An epidemiological study was conducted on 825 pre-school children (422 from anganwadi and 402 day care children) of Udupi to determine their dental caries experience. Out of the 422 Anganwadi children, 215 (50.9%) were males and 207 (49.1%) were females. In day care centre group, 209 (51.9%) were males and 194 (48.1%) were females. The number of children in Anganwadi in 3, 4 and 5 year age groups were 124 (29.4%), 167 (39.6%) and 131(31.0%) respectively. The number of day care children in 3, 4 and 5 year age groups were 115 (28.5%), 134 (33.3%) and 154(38.2%) respectively. (Table 1)

Table 2 illustrates the prevalence of dental caries among anganwadi and day care children. The prevalence of dental caries was 64.2% among anganwadi children and 61.0% among day care children, but this difference was not found to be statistically significant (p=0.34). The prevalence of missing teeth was significantly higher among anganwadi children (6.4%) as compared to day care children (3.2%) (p=

Table 1: Distribution of study population according to age and gender

Variables		Anganwadi school children	Day care centre/ play school children	Total
Gender of child	Boys	215(50.9%)	209(51.9%)	424 (51.4%)
	Girls	207(49.1%)	194(48.1%)	401 (48.6%)
Age of child	3 years	124(29.4%)	115(28.5%)	239 (29.0%)
	4 years	167(39.6%)	134(33.3%)	301 (36.5%)
	5 years	131(31.0%)	154(38.2%)	285 (34.5%)
Total		**422 (100%)**	**403(100%)**	**825 (100%)**

Table 2: Prevalence of dental caries among anganwadi and day care children

Variables	Anganwadi children N (%)	Day care children N(%)	P value
Decayed teeth	271 (64.2%)	246 (61.0%)	0.34
Missing teeth	27 (6.4%)	13 (3.2%)	0.03*
Filled teeth	58 (13.7%)	150 (37.2%)	0.001**

*P<0.05 as statistically significant, **p<0.01 as highly significant

0.03). The prevalence of filled teeth was significantly higher among day care children (37.2%) as compared to anganwadi children (13.7%) ($p < 0.001$). Table 3 shows the dental caries experience among anganwadi and day care children. The mean deft score was significantly higher among anganwadi children (3.74 ±3.58) as compared to day care children (3.26 ±3.32) ($p = 0.04$). Anganwadi children had significantly higher mean number of decayed teeth, missing teeth and lower filled teeth as compared to day care children.

Table 4 demonstrates the caries prevalence according to gender. The prevalence of dental caries was significantly higher among girls (67.6%) as compared to boys (58.0%) ($p = 0.005$). The prevalence of missing and filled teeth was not found to be significantly different among boys and girls.

Dental caries experience in relation to gender is revealed in Table 5. Statistically, no significant difference was found in caries experience between boys and girls ($p = 0.48$) but the mean deft score was higher among girls (3.59 ± 3.35) than boys (3.43 ± 3.55). Girls had slightly higher mean number of decayed teeth, filled teeth and lower missing teeth as compared to boys but the difference was not statistically significant.

DISCUSSION

Caries is the most prevalent affliction of children. Despite credible scientific advances and the fact that caries is preventable, the disease continues to be major public health problem especially in developing countries. Although dental caries has been declining globally in general population, more so among older children, the caries prevalence in younger ones has not shown a significant decline. Most of surveys have targeted either adult or school going children because of their easy accessibility which is not so in pre-school children.

Table 3: Dental caries experience (Mean ± SD) among anganwadi and day care children

Variables	Anganwadi children Mean (SD)	Day care children Mean (SD)	P value
Decayed teeth	3.30 (3.43)	2.46 (3.04)	0.001**
Missing teeth	0.10 (0.41)	0.05 (0.26)	0.01*
Filled teeth	0.33 (0.94)	0.75 (1.18)	0.001**
Deft	3.74 (3.58)	3.26 (3.32)	0.04*

*P<0.05 as statistically significant, **p<0.01 as highly significant

Table 4: Prevalence of dental caries according to gender

Variables	Boys N (%)	Girls N (%)	P value
Decayed teeth	246 (58.0%)	271 (67.6%)	0.005
Missing teeth	26 (6.1%)	14 (3.5%)	0.07
Filled teeth	97 (22.9%)	111 (27.7%)	0.11

*P<0.05 as statistically significant, **p<0.01 as highly significant

Table 5: Dental caries experience (Mean ± SD) according to gender

Variables	Boys Mean (SD)	Girls Mean (SD)	P value
Decayed teeth	2.83 (3.40)	2.96 (3.11)	0.57
Missing teeth	0.09 (0.37)	0.06 (0.30)	0.18
Filled teeth	0.51 (0.94)	0.57 (1.08)	0.38
deft	3.43(3.55)	3.59 (3.35)	0.48

*P<0.05 as statistically significant, **p<0.01 as highly significant

This present study was conducted on 825 pre-school children aged 3-5 years in anganwadi and day care centre of Udupi Taluk, Karnataka, India. Dental caries is a lifestyle disease that begins when the child's teeth erupt in the oral cavity. Caries can be effectively prevented and controlled through a combination of community professional and individual actions. Detection of disease is, in most cases, crucial to control the oral condition using preventive and therapeutic regimes.

In the present study, caries prevalence was found to be 64.2% in the anganwadi children and 61.0% in day care children, but the difference was not statistically significant. The higher prevalence of dental caries among preschool age group might be attributed to poor oral hygiene, erratic feeding habit, infrequent mouth rinsing after every meal, negligence on the part of parents and caretakers and lack of dexterity in this age group and also due to unavailability and non-affordability of dental services.

The findings of present study are comparable with other studies done on oral health status of preschool children in India and abroad. The prevalence of dental caries in this study was lower than those reported in previous studies conducted in South Kanara by Goel P et al(5), Shenoy R et al(6), Sudha P et al(7) and Shetty NS and Tandon S(8). A lower prevalence was reported in Karnataka in National Oral Health Survey(9) amongst 5-year old children and studies done by Mahejabeen et al(10) , Dhar V et al(11) , Holm AX(12) and Singh S et al(13). The study done by Gupta AK et a1(14) reported prevalence of dental caries as follows: 70%, 53%, 25%, 50.8% and 51.46% in the age group of 5-6 years in Bangalore (Urban), Davangere (Urban), Davangere (Rural) Andhra Pradesh (Rural) and Kerala (Rural) respectively.

The results of the present study had reported the prevalence of missing teeth

as 6.4% in anganwadi children and 3.2% in day care children. Prevalence of filled teeth was 13.7% in anganwadi children and 37.2% in day care children and this difference was statistically significant. In the study done by Dhar V et al(11), the lower prevalence of missing and filled teeth were reported as compared to present study.

The dental caries experience which is assessed by using mean deft score was significantly higher among anganwadi children (3.74 ±3.58) as compared to day care children (3.26 ±3.32). These results are in concordance with those reported in studies done by Shenoy R et al(6), Kumar MP(15), Rao A et al(16). A lower value of mean deft (1.7) was reported in Karnataka in National Oral Health Survey amongst 5-year old children(9) and studies done by Tewari S et al(17), Singh S et al(13) and Dhar V et al study(11). In the studies done by Askarizadeh N et al(18) and Wyne et al(19), high mean deft was reported as compared to the present study.

The mean dt score was 3.30 ± 3.43 in anganwadi children and 2.46 ± 3.04 in day care children. A higher proportion of decayed teeth were seen in studies done by Shenoy R et al(6) and Sayegh A et al(20). A lower mean dt was reported in Karnataka in National Oral Health Survey conducted by Dental Council of India amongst 5-year old children (9). The major part of the mean deft score consists of decay category (d). This finding clearly reflect the high level of unmet dental needs, lack of utilization of oral health services, lack of oral health awareness and socioeconomic status and attitude of the parents towards dental health.

The mean number of missing teeth among anganwadi and day care children were 0.10 ± 0.41 and 0.05± 0.26 respectively. This was in conformity with those as reported in Karnataka in National Oral Health Survey amongst 5-year old children (9). The mean number of filled teeth was 0.33 ± 0.94 among anganwadi and 0.75 ±1.18 among day care children which were slightly lower than as reported by Shenoy R et al (6). Anganwadi children had significantly higher mean number of decayed teeth, missing teeth and lower filled teeth as compared to day care children. The reason for this could be anganwadi children belonged to lower socioeconomic class, so they are unable to afford dental services and oral hygiene measures like toothpaste and tooth brushes.

The mean deft score was higher among girls (3.59±3.35) than boys (3.43±3.55), however this difference was not statistically significant (p=0.48). This is in accordance with studies done by Sogi G et al (21) and Frencken JE et al (22). Girls had slightly higher mean number of decayed teeth, filled teeth and lower missing teeth as compared to boys. The prevalence of dental caries was significantly higher among girls (67.6%) as compared to boys (58.0%) (p=0.005). The studies conducted by Virdi M et al (23) and Luca et al (24) showed slightly higher prevalence in girls than boys but with statistically not significant differences. Differences between the sexes can also be attributed to the fact that girl's teeth erupt at an earlier age than boy's teeth which is in accordance with study done by Saravanan et al (25) and Tewari Amrit et al (26). Besides this, the lack of oral hygiene measures and lack of parental guidance, geographic location and probability of girl child being neglected due to cultural differences seen in Indian society where males are given priority can be other contributing factors.

CONCLUSION

The high caries experience in this study revealed that there is a great need to plan and conduct oral health promotion initiatives and treatment activities for 3-5 years old preschool children so that they have healthier dentition. It is essential that appropriate caries preventive approaches should be implemented from birth, with more intensive support for those at increased risk of disease. The oral health education at an initial stages including proper instruction of oral hygiene practices and school based preventive programs, would help in improving preventive dental behavior and attitude which is beneficial for lifelong. Oral health promotion programs should be extended to all health care facilities where children from all socio-economic levels are visiting from infancy on.

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