

Prevalence of Dental Caries and Treatment Needs Among 3-5 Year Old Preschool Children in Narmada, Gujarat

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Abstract:

Background: Dental caries is a chronic disease with multi factorial etiology and pathogenesis and is the most prevalent unmet health care need of children.

Aim & Objectives: The aim of the study was to assess the prevalence of dental caries in preschool children aged 3-5 years in Narmada, Gujarat.

Material And Methods: A cross sectional community based study on the prevalence of dental caries and treatment needs of preschool children aged 3-5 years was conducted in Narmada District, Gujarat. A survey proforma was prepared with the help of WHO Oral Health Assessment Form. Caries was recorded using Dentition Status and Treatment Needs (WHO 1997). Decayed, missing and filled teeth were calculated from the information. Descriptive statistical analysis was carried out in the present study. Significance is assessed at 5% level of significance. The Statistical software namely SPSS 16.0 was used for the analysis of data and Microsoft word and Excel has been used to generate graphs, tables etc.

Results: The overall prevalence of 71.1% of the study population was affected by caries with a mean dmft 3.50 ± 2.71 . The prevalence of Dental caries was higher in males 76.3% as compared to females 66.7%.

Conclusion: The results of this study indicates that caries prevalence was high among the preschool children of Narmada district Gujarat and substantial efforts are required to prevent caries in this population.

Keywords: Prevalence, Dental caries, Preschool children, treatment needs, Narmada, Gujarat.

I. Introduction

Dental caries is a disease which can be traced back to be as old as civilization with its evidence seen even in the skeletal remnants of prehistoric man¹ but the prevalence of this disease has increased in the modern times on a worldwide basis. This disease can aptly be termed as a scourge to modern civilization and no nation or continent has escaped the ill effects of this malady. Dental caries and its consequences together constitute a very real and personal problem for almost every man, woman and child.

Caries is a chronic disease with multi factorial etiology and pathogenesis. It is an infectious disease which like other infectious diseases cannot be controlled with antibiotics.² The main cause of dental caries are dental plaque associated with bacteria including Streptococcus Mutans and Lactobacillus. The prevalence and severity of caries in a population is influenced by several risk factors like age, gender, dietary patterns, oral hygiene habits as well as social class. Caries is the outcome of a highly complex process reflecting biological and genetic susceptibility as well as many related individual, social, environmental and cultural factors.³

Diet affects the development and integrity of the oral cavity as well as progression of diseases of the oral cavity, and are major multifactorial environmental factors in the etiology and pathogenesis of oro-facial diseases and disorders.⁴ Oral health means more than good teeth; it is integral to general health and essential to well being.⁵

Age is an important factor to be regarded in order to better understand oral health. Children suffer from many infectious diseases during the first three years of life around the time of eruption of deciduous teeth.⁶ The problem is more critical in children due to lack of proper brushing, high carbohydrate consumption and most of poor patient awareness.

Childhood is an important period for instituting preventive programs because as primary teeth erupt, bacteria colonize the tooth surfaces and dental behavior starts to develop during this time. The establishment of good oral health practices in early life could lead to a healthier mouth life time.⁷ For this awareness of various

oral disorders, their causes, prevention and cure must be created at the earliest available opportunity. Preschool children therefore form a very potential group which can be targeted to inculcate oral health values.

Therefore, an attempt is made to look into the nutritional status and oral health of preschool children in this area to preserve their future generations. With the above background, this study was conducted to assess the prevalence of dental caries in preschool children aged 3-5 years in Narmada, Gujarat.

II. Material And Methods

A cross sectional community based study on the prevalence of dental caries and treatment needs of preschool children aged 3-5 years in Narmada District, Gujarat was conducted by the Department of Public Health Dentistry, I.T.S- Centre for Dental Studies, Muradnagar. The study was conducted on preschool children of age group 36-60 months in Narmada, District Gujarat. By the age of three years, all the deciduous teeth are present in the oral cavity and at 5 years of age the deciduous teeth are exposed to the oral environment for some period of time and also no permanent teeth have erupted in the oral cavity. So the age group of 36-60 months was selected for this study.

Pilot study was conducted during the month of August- September 2011. A group of 90 subjects by convenient sampling were selected and examined according to the methods and criteria set for the study.

A list of anganwadis with their names, total number of children, and their range of ages were obtained from the Integrated Child Development Project Programme Officer through District Health Department and Block Education Officer through District Education Department in Narmada, District respectively. This list served as a sampling frame for the study. The sample size was determined based on the results of the pilot study. Hence, a total of 1036 subjects from different anganwadis were to be included.

The ethical clearance was obtained from the college authorities and the District development officer. Informed written consent was obtained from the parent/ caregiver of the children along with the verbal consent of the child before the conduct of the examination. The data was collected during the months of January 2013 to March 2013. It was established during the standardization practice that both the interview and clinical examination of the study participant may take around 15-20 minutes per subject.

Caries was recorded using Dentition Status and Treatment Needs (WHO 1997).⁸ Decayed, missing and filled teeth were calculated from the information. Teeth were considered carious when there was visual evidence of a carious lesion. Early stages of dental caries and questionable lesions were excluded and considered sound. No radiographs were taken.

Descriptive statistics, namely frequencies and percentages for categorical data and means and standard deviations or medians and percentiles for continuous data, were calculated. Significance is assessed at 5% level of significance. SPSS version 16 was used for analysis.

III. Results

A total of 1036 preschool children aged 3-5 years participated in study Figure 1 & 2 represents distribution of participants according to age.

Table 1 represents the prevalence of Dental caries in study population A total of 71.1% of the study population was affected by caries with a mean dmft 3.50 ± 2.71 .

Table 2 depicts prevalence of dental caries according to age and gender of the study population, the prevalence of Dental caries was 82.4% among 36-42 months, 74.5% among 42-48 months, 68.2% among 48-54 months and 64.2% among 54-60 months respectively. A high prevalence of 82.4% caries was found among 36-42 months age group. The mean dmft of the study population with respect to age was 3.35 ± 2.25 , 2.97 ± 2.13 , 2.66 ± 2.17 and 2.17 ± 2.05 respectively.

The prevalence of Dental caries was higher in males 76.3% as compared to females 66.7%. The mean dmft of the study population with respect to gender was 2.98 ± 2.16 in males and 2.50 ± 2.17 in females respectively. Table 3 represents the dmf components of the study population, the mean decay component of the study population was 2.72 ± 2.184 while the mean missing component was 0.78 ± 1.387 . No filled teeth were found in our study. The mean dmft was 3.50 ± 2.711 .

This shows that the total study population had no filled teeth, though they had a considerable amount of decayed teeth. One surface filling was the most common treatment need in all the age groups, 53.6% in 36-42 months, 43.5% in 42-48 months, 41.7% in 48-54 months and 43.3% in 54-60 months. Two or more surface filling was required in 25.5%, 25.6%, 27.8% and 20.4% respectively. Pulp care was required in 23.3% of study population in age group 54-60 months followed by 21.3% in 48-54 months, 19.5% in 42-48 months, 7.7% in 36-42 months while extraction was required age group of 42-48 months and 48-54 months, 2.9% in the age group of 36-42 months. Preventive care was required in 10.3%, 7.4%, 5.2% and 8.8% of 36-42 months, 42-48 months, 48-54 months and 54-60 months respectively. This shows that one surface filling was the most common treatment need followed by two surface filling, pulp care and space maintainer.

IV. Discussion

The present study was conducted to provide baseline data on the prevalence of dental caries and treatment needs among preschool children aged 3-5 years Narmada Gujrat.

The prevalence of dental caries in our study population is 71.1% with a mean dmft of 2.71 ± 2.34 . This is in accordance with the studies conducted by **Rao et al**⁹ (75.3%), **Shenoy R et al**¹⁰ (81%), **Wyne A**¹¹ (74.8%). The mean dmft score is in accordance with the studies conducted by **Dileep CL et al**¹² in Lakhanpur, Kanpur (2.33), **Mahejabeen R et al**¹³ (2.70), **Tewari S and Tewari S**¹⁴ (2.37). The higher prevalence of caries in our study can be attributed to improper feeding practices, familial socioeconomic background, lack of parental education relating to dental knowledge, lack of access to dental care facility and the addition of late dental visit for routine checkup.

Lower prevalence of dental caries is observed in studies conducted by **Mahajabeen et al**⁸ (54.1%) in Hubli Dharwad, **Saravanan S et al**¹⁵ (44.4%) in Pondicherry as compared to our study. The lower prevalence may be due to the fact that **Mahajabeen et al**⁸ had considered only those children who had visited the hospital at Dharwad while **Saravanan S et al**¹⁰ conducted the study only on urban children. Higher prevalence for dental caries (94.3%) is observed in a study conducted by **Sudha P**¹⁶. This may be due to the higher age group under consideration i.e. 5-7 years. Higher mean dmft scores are obtained in studies conducted by **Wyne A**¹⁷ (6.1 ± 3.9) in Riyadh, Saudi Arabia and **Khan M**¹⁸ (3.8 ± 4.4) in Swat, Pakistan.

The mean number of decayed deciduous teeth in our study population is 2.71. This finding is in accordance with the studies conducted by **Mahajabeen R et al**⁸ where the mean decay component is 2.70, **Henkuzena I et al**¹⁹ (2.61). **Lo ECM et al**²⁰ observes a low mean decayed score of 1.4 in Hong Kong while **Jazrawi KH**²¹ observes a higher mean decay score of 6.70 in a study conducted in Mosul city.

Data from the present study reveals that dmft differs with age. In the present study mean dmft score decreased significantly with age which was not in accordance with studies conducted by **Mathur A et al**²² in Udaipur where the mean dmft score for 3 years is 0.28 for 4 years it is 0.28 and for 5 years it is 0.44 with a significant difference. **Carino et al**²³ in Phillipines demonstrates a significant difference in mean dmft score according to age as 7.4, 8.8 and 9.8 for 3 years, 4 years and 5 years respectively. **Mahajabeen et al**⁸ also demonstrates a highly significant difference with respect to age ($p < 0.001$).

The present study shows no significant difference in the prevalence of dental caries between genders but males showed a slightly higher prevalence of dental caries (74.22%) as compared to females (69.94%). The results of this study are in accordance with the studies conducted by **Mahajabeen R et al**⁸ (53.9% for males and 46.1% for females), **Ogido EM et al**²⁴ (11.6% for males and 10.3% for females).

This study has provided useful baseline data for future comparisons. The information on caries prevalence would assist in the determination of treatment needs and preventive efforts required in this population. It could be deduced from the above results and discussion that considerable efforts are required in prevention of dental caries in these preschool children.

V. Conclusion

The establishment of good oral health practices early in life can lead to a healthier mouth in later years of life. For this to happen, awareness of the various oral disorders, their causes, prevention and cure must be created at the earliest available opportunity. Thus a survey was conducted to assess the prevalence of dental caries and Treatment needs among 3-5 year old preschool children of Narmada Gujarat.

The results of this study indicates that caries prevalence was high among the preschool children of Narmada district Gujarat. The caries prevalence and mean dmft was significantly higher. These findings established reliable base-line data regarding the prevalence, distribution, and severity of dental caries as well as useful epidemiological data on the required treatment needs of 3-5 year children.

The results of this study indicate that substantial efforts are required to prevent caries in this population. The implementation of community based oral health promotion programs is a matter of urgency. Such programs could be initiated through health promoting school projects.

Acknowledgement

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Figures And Tables:-

Figure 1:- Age wise distribution of the study participants

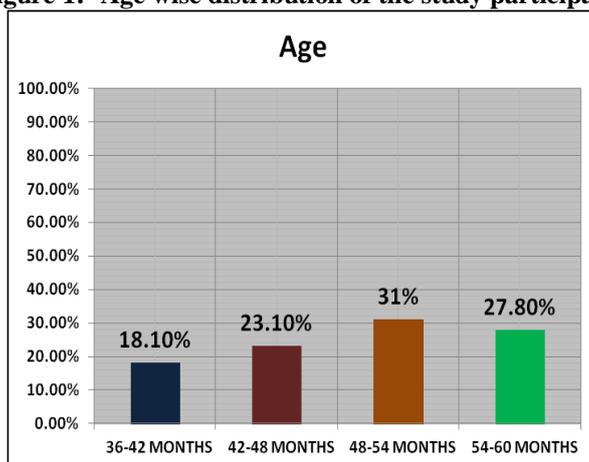


Figure 2:- Gender wise distribution of the study participants

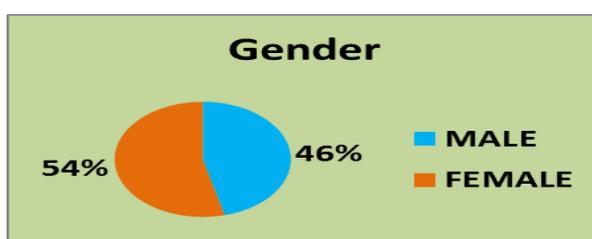


Table 1 : Prevalence of Dental Caries in the Study Population

DENTAL CARIES (N= 1036)		Percentage distribution(%)
PRESENT	737	71.1
ABSENT	299	28.9
TOTAL	1036	100

Table 2: Prevalence of Dental Caries in the Study Population according to Age and Gender

	AGE (Months)				GENDER	
	36-42 months (188)	42-48 months (239)	48-54 months (321)	54-60 months (288)	Male (477)	Female (559)
Caries affected (%)	155 (82.4%)	178 (74.5%)	219 (68.2%)	185 (64.2%)	364 (76.3%)	373 (66.7%)
Caries free (%)	33 (17.6%)	61 (25.5%)	102 (31.8%)	103 (35.8%)	113 (25.77%)	186 (30.05%)
Mean dmft	3.35±2.25	2.97±2.13	2.66±2.17	2.17±2.05	2.98±2.16	2.50±2.17
p- value	0.000					0.001

Table 3 : Distribution of dmft components among Study Population according to teeth

dmft component	No. of Teeth	Mean	SD
Decayed (d)t	2818	2.72(2.59-2.85)	2.184
Missing (m)t	803	0.78(0.69-0.86)	1.387
Filled (f)t	-	-	-
dmft	3621	3.50(3.33-3.66)	2.711

Table 4 : Distribution of Study Population according to Treatment Needs

Age (mnths)	No. of children requiring treatment	MODE OF TREATMENT						
		Preventive care	One surface filling	Two surface filling	Pulp care	Extraction	No. of Teeth requiring treatment	Space Maintainer
36-42	159(21.1%)	44(10.3%)	234(53.6%)	112(25.5%)	34(7.7%)	13(2.9%)	439	32
42-48	182(24.5%)	49(7.4%)	293(43.5%)	173(25.6%)	132(19.5%)	27(4%)	674	72
48-54	223(29.5%)	41(5.2%)	329(41.7%)	219(27.8%)	168(21.3%)	31(4%)	788	92
54-60	189(24.9%)	81(8.8%)	397(43.3%)	187(20.4%)	213(23.3%)	39(4.2%)	917	102