Application of Multiple regression technique in determining important factor related to dental caries in children of rural Haryana

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Citation

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Abstract

Dental fluorosis and dental caries are the most common preventable dental problems of this era. Dental caries is a bacterial disease and can be easily prevented by oral hygiene practices, calcium and vitamin C in diet. Lack of awareness along with lack of dentists contributes to the problem. The present study was planned to know the extent of problem in the rural children of block, Beri, Haryana. No significant association was observed in the development of dental caries with caste and occupation. There was a highly significant association found between the habit of daily brushing and the development of dental caries. Family income was also significantly associated with the occurrence of dental caries in the children. The multiple regression analysis showed brushing is the most important factor related with the development of dental caries followed by increase in age.

DEPARTMENT AND INSTITUTION WHERE THE WORK WAS DONE

Rural field practice attached to Dept. of Community Medicine, Pt. B.D. Sharma PGIMS, Rohtak and Department of Biostatistics, Pt. B.D. Sharma PGIMS, Rohtak, India.

INTRODUCTION

Oro-dental diseases have been increasing both in prevalence and severity over the last a few decades. More than 90% of the adult community after the age of 30 years suffers from periodontal diseases. Moreover 35% of all body cancers are oral cancers. 35% of the children suffer from mal-aligned teeth and jaws, affecting proper functioning[1]. Dental fluorosis and dental caries are the most common preventable dental problems of this era. Dental caries is a bacterial disease and can be easily prevented by oral hygiene practices, calcium and vitamin C in diet but no attention is paid to the problem especially in the rural areas. Lack of awareness along with lack of dentists contributes to the problem. More than 90% of the doctors are available in the urban settings and only 10% available to the 72% of the rural population[2]. Dentist/population ratios in rural and urban settings are 1:1, 50,000 and 1:30,000 respectively[3]. WHO focused its attention on oral health in 1994 and chosen the theme oral health for healthy life - for world health day that year[4]. Ministry of Health and Family welfare, Govt. of India accepted in principal national oral health policy in the year 1995 to be included in national health policy. The present study was planned to know the extent of problem in the rural children of block, Beri, Haryana.

AIMS AND OBJECTIVES

1. To find out the prevalence of dental caries in children.
2. To study the association of common demographic factors with the development of dental caries.

MATERIAL AND METHODS

It was a descriptive type of epidemiological study and the design adopted for the study was cross-sectional. The study was conducted in Block Beri (distt. Jhajjar), field practice area attached to department of Community Medicine, Pt B. D. Sharma PGIMS, Rohtak between April 2003 to August 2004. Two stage simple random techniques were used for sampling. Initially 15 villages were selected by simple random sampling technique using lottery method and subsequently 50 children in the age group of 7-14 years belonging to the families which are permanently residing in the selected villages were chosen (also by simple random sampling technique using sub-centre registers) for the study to get a total sample size of 750, which were more than the minimum calculated desired sample size (at 95% level of significance and 10% allowable error for assumed

prevalence of 35%).

Data collection and statistical analysis: Data was collected by interviewing the children and their parents, taking history and examining the subjects clinically during house to house visits. Percentages, chi-square test and multiple regression tests were applied to analyze the data.

RESULTS

The study was carried out in 368 male and 382 female children and the prevalence of dental caries was almost similar in both the sexes (Table 1). The prevalence of caries decreased from 39.2% - 28.3% with increase in age i.e. from 7 – 14 years (Table 2) but the decrease was not statistically significant. No significant association was observed in the development of dental caries with caste and occupation (Table3 and 4). Table 5 showed that there was a highly significant association found between the habit of daily brushing and the development of dental caries. Family income was also significantly associated with the occurrence of dental caries in the children as shown in table 6. The multiple regression analysis (Table 7) showed brushing is the most important factor related with the development of dental caries followed by increase in age.

Figure 1

Table 1:Sex-wise distribution of dental caries in study subjects (n=750)

Sex	Caries		Total
	Present	Absent	
Male	122 (49.8)	246 (48.7)	368 (49.1)
Female	123 (50.2)	259 (51.3)	382 (50.9)
Total	**245 (100)**	**505 (100)**	**750 (100)**

Chi-square value = 0.077 df =1 p =0.781

Figure 2

Table 2:Age-wise distribution of dental caries in study subjects (n=750).

Age groups	Caries		Total
	Present	Absent	
7-9 years	69 (39.2)	107 (60.8)	176 (100)
9-12 years	114 (32.1)	241 (7.9)	355 (100)
12-14years	62 (28.3)	157 (71.7)	219 (100)
Total	**245 (32.7)**	**595 (67.3)**	**750 (100)**

Chi-square value = 5.359 df =2 p =0.069

Figure 3

Table 3:Caste-wise distribution of dental caries in study subjects (n=750).

Caste	Caries		Total
	Present	Absent	
Jat	122 (49.8)	263 (52.1)	385 (51.3)
Others	31 (12.7)	72 (14.3)	103 (13.7)
SC	58 (23.7)	85 (16.8)	143 (19.1)
BC	34 (13.8)	85 (16.8)	119 (15.9)
Total	**245 (100)**	**505 (100)**	**750 (100)**

Chi-square value = 5.434 df =3 p =0.143

Figure 4

Table 4: Distribution of dental caries in study subjects (n=750)according to occupation of parents.

Occupation	Caries		Total
	Present	Absent	
Farmer	91 (37.1)	208 (41.2)	299 (49.9)
Labourer	67 (27.4)	132 (26.1)	199 (26.5)
Shop-keeper	12 (4.9)	26 (5.2)	38 (5.1)
Others	75 (30.6)	139 (27.5)	214 (28.5)
Total	**245 (100)**	**505 (100)**	**750 (100)**

Chi-square value = 4.298 df =3 p =0.367

Figure 5

Table 5: Distribution of dental caries in study subjects according to brushing habits (n=750)

Brushing	Caries		Total
	Present	Absent	
Yes	77 (31.4)	240 (47.5)	317 (42.3)
No	168 (68.6)	265 (52.5)	433 (57.7)
Total	**245 (100)**	**505 (100)**	**750 (100)**

Chi-square value = 17.515 df =1 p = 0.000

Figure 6

Table 6: Distribution of dental caries in study subjects (n=750) according to income of parents.

Income	Caries		Total
	Present	Absent	
<1000	3 (1.2)	6 (1.2)	9 (1.2)
1000-3000	112 (45.8)	190 (37.6)	302 (40.3)
3000-5000	108 (44.1)	249 (49.3)	357 (47.6)
5000-10000	18 (7.3)	59 (11.7)	77 (10.3)
>10000	4 (1.6)	1 (0.2)	5 (0.7)
Total	**245 (100)**	**505 (100)**	**750 (100)**

Chi-square value = 11.74 df =4 p =0.019

Figure 7

Table 7: Regression analysis of dental caries with respect to different study variables (n=750).

Factors	Unstandar-dized Coefficient	Std. Error	Standardized Coefficient	t	Sig.
Age	.05219	.024	.081	2.212	.027
Sex	.05219	.034	-.005	-.133	.894
Caste	.006472	.017	.016	.387	.699
Occupation	-.02449	.015	-.065	-1.658	.098
Income	.04101	.027	.061	1.520	.129
Brushing	-.146	.035	-.154	-4.218	.000

Constant = 1.735

RECOMMENDATIONS

Children will be specifically targeted for oral health promotion. Adoption of regular brushing habit, regular dental check-ups and avoidance of carieogenic foods i.e. fast foods, junk foods, sweets etc will help in prevention of dental caries. Children should be told that too much eating sweets might lead to decay of tooth. Short-term training of teachers, health workers and health personnel for screening of cases and referring those for further management, should be done. Training of anganwari workers so that they will inculcate brushing habits as a part of non-formal pre-school education in the children should be prioritized. Awareness and IEC about oral health and to disseminate messages of its importance by mass media and folk media should be strengthened. Legislative measures should be adopted to ensure statuary warnings on the wrappers and advertisements of sweets and chocolates and other retentive sugar eatables.

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References

1. Fourth conference of Central Council of Health and Family Welfare- Proceedings and resolutions. October 11-13, 1995 New Delhi. Bureau of planning, Directorate General of Health Services, MOHFW, Govt. of India, New Delhi.
2. National Oral Health Policy: Prepared by core committee, appointed by Ministry of Health and Family Welfare, 1995.
3. Lal S, Paul D, Pankaj, Vikas,Vashisht BM. National Oral Health Care Programme (NOHCP) Implementation strategies (editorial). Indian J Commun Med 2004; 29:3-5.
4. Oral Health: ICMR Bulletin, Volume 24, April 1994. ICMR, New Delhi.

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