

Comparison of Associating factors of Dental Caries in urban and rural children in Jaipur, (Raj) India.”

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Abstract: Research Question: Comparison of Associating factors of Dental Caries in urban and rural children in Jaipur, (Raj) India.

Methodology: A cross-sectional observational study was carried out on 1600 urban and 1600 rural school children of Jaipur in year 2011. Two blocks for urban areas and two Panchayat Samities for rural areas were selected randomly for the study. Socio-demographic data were collected from parents of children and thorough dental check-up was arranged by a dentist for these children. Children with Carries were identified. Data in details were collected as per pre-designed proforma. Data collected were analysed and inferred with chi-square test.

Result: 37.66% of children were diagnosed as having dental carries. Dental carries was significantly ($P<0.001$) lesser in rural areas (27.94%) than in the urban areas (47.38%). In urban areas age and socio-economic status were found more associated ($p<0.001$) with dental carries than sex, mouth ringing frequency, teeth cleaning material and teeth cleaning frequency ($p<0.05$). In rural areas age, teeth cleaning material and teeth cleaning frequency were found more associated ($p<0.001$) with dental carries than mother's education, dentist visit and mouth ringing frequency ($p<0.05$).

Conclusion: More than one third students were having dental Carries. Urban children were having significantly more dental carries than rural. Age, mouth ringing frequency, teeth cleaning material and teeth cleaning frequency were found associated in urban as well as rural areas. In urban areas sex and socio-economic status but in rural areas mother's education and dentist visit were different associating factors with dental carries.

Key words: Dental carries, Socio-demographic, chi-square Test, P Value

I. Introduction

Oral health is fundamental to general health and well being, significantly impacting on quality of life.¹ The ability to chew and swallow is a critical function required to obtain essential nutrients for the body.² Oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world

Dental caries has historically been considered the most important global oral health burden. The World Health Organization's 2003 report on oral health provides an overview of global caries epidemiology that confirms its international pandemic distribution. Globally, WHO reports caries prevalence in school-age children at 60-90 percent and is virtually universal among adults in the majority of countries. WHO has observed that developed countries have higher rates of caries experience, while developing countries have lower rates.¹

In India prevalence of dental caries in the age group 12-15 years is 45-55 percent in UP, Delhi and Rajasthan as compared to 40-80 percent in Northern States.² Jain (1979)³ at RHTC Naila Jaipur and Broca J.S.et al (1983)⁴ of at Ajmer observed prevalence of dental caries 15.90% and 30 % respectively. It is the commonest cause for loss of teeth among young school children.⁵ Oral health has not been given sufficient importance in our country; preventive dental care is almost nonexistent in the rural areas and very limited in urban areas. Oral health care in rural areas is limited due to shortage of dental manpower, financial constraints and the lack of perceived need for dental care among rural masses.⁶

II. Materials and Methods

The present Cross Sectional Analytic type of Observational study was carried out in year 2010 on 1600 School going children aged 5-16 years from each of urban and rural areas . As per Department of Education, Jaipur District has four urban blocks; namely Jaipur East, Jaipur West, Jhotwara and Sanganer. Out of these Jaipur west and Jhotwara were selected randomly for the study. Likewise the rural area of Jaipur District is constituted by 13 Panchayat Samities, out of that two Amber and Jamwaramgarh were selected randomly for the study.

Sample size: Sample size was calculated 1600 subjects at 95% confidence limit with 10% allowable error assuming 20% prevalence of dental caries. So for the study purpose 1600 children from schools of rural areas and 1600 children from schools of urban areas was included in study. List of rural and urban schools in the selected area was procured from the office of Deputy Director of Education Department, Jaipur District. Schools were also selected randomly using the simple random technique from the procured list to achieve the desired sample size i.e. 1600 from rural and 1600 from urban areas.

Every Institutional Head of identified school was informed about the purpose and methodology of the study and those who had given consent were given the consent form and proforma for parents. 1st part of the designed proforma consisting general information about the child and his family was given to parents of the child through the respective class teachers. After the forms were duly filled up by the parents of the study subjects, it was subsequently collected from the class teachers. Identified Schools were visited on the mutually pre-decided date and time so as to examine the maximum number of study subjects by a dentist. Children were examined in the school premises at a suitable place in presence of respective class teachers with the subjects seated in ordinary chairs in natural day light for illumination, avoiding direct sunlight.

Finally the screened students were examined thoroughly for dental and periodontal diseases, after reassuring them and making them comfortable and taking all necessary aseptic precautions. Part second of the predesigned proforma was filled after examining each child. The same procedure was in identified schools till the sample size of 1600 students of rural and 1600 students of urban area were achieved. Dentition status and treatment need was assessed using Oral Health Assessment Form 2004 [3] by a dentist. Only relevant information related with periodontal diseases along with general information was collected on predesigned proforma. Data thus collected was compiled, analyzed with Microsoft excel 2007.

III. Results

The present study has been designed to compare the associating factors of dental Caries amongst students in 5-16 years of age group studying in elementary schools of rural and urban Jaipur. Of the total 3200 students (1600 rural and 1600 urban) found in 20 identified schools in the study, dental Caries was found in 1205 (37.66%) surveyed students.

Present study revealed that rural children had significantly less ($p < 0.001$) dental Caries than the urban children i.e. 27.94% v/s 47.38%.

Regarding associated factors in the present study age, mouth rinsing frequency, teeth cleaning material and teeth cleaning frequency were found associated with dental caries in urban as well as rural areas.

Further it is revealed that maximum children with caries were found in 8-10 years of age in both urban and rural areas. The difference in proportion in cases of dental caries was found to be highly significant ($P < 0.001$) in both urban and rural areas.

This study observed that sex was found to be associated ($p < 0.05$) in urban areas whereas in rural areas it was not ($P > 0.05$).

In the present study type of family, religion and source of drinking water was not found to be associated ($p > 0.05$) with dental caries in urban as well as in rural areas.

Regarding socio-economic status, it was found to be associated ($P < 0.001$) with dental caries in urban areas whereas in rural areas it was not.

Further it was found in this study that Father's and mother's education was found to be associated with dental caries in rural areas but in urban areas it was not. It was observed that as education increases proportion of dental caries cases decreases.

In the present study mouth rinsing was found to be associated with dental caries ($p < 0.05$) in urban as well as in rural areas.

Type of material used for teeth cleaning and frequency of teeth cleaning were found to be associated with dental caries in both the urban and rural areas. Caries was found maximum in children who did not clean their teeth even once and minimum in children who clean their teeth with tooth paste. More so it was also observed with this study that frequency of teeth cleaning was also associated with dental caries in a manner i.e. as the frequency of teeth cleaning increases dental caries decreases.

In the present study, it was observed that the age, type of teeth cleaning materials used, mouth rinsing and teeth cleaning frequency were associated with dental caries while the type of family, religion, father's

literacy level, drinking water source and type of food consumed were not associated with dental caries both in the urban and rural belts.

IV. Discussion

The present study showed that dental caries was present in 37.66%. Studies reported by Jain (1979)³ at RHTC Naila Jaipur. Broca J.S. et al (1983)⁴, at Ajmer, K Pandit et al (1986)⁷ at Delhi observed 15.90%, 30%, 33.19% cases of dental caries respectively; the proportion of the cases were little higher in the present study population i.e. 37%. In contrast to the present study, Dash et al (2002)⁸ at Cuttak, Josh (2003)⁹ at Kerala, Saravanan S et al (2003)¹⁰ in Pondichery, Dhar V et al (2007)¹¹ at Udaipur, Joyson Moses (2011)¹² have reported higher percentages of dental carries i.e. 64.3%, 54.3%, 44.4%, 46.75% and 63.83% respectively. This variation may be due to the diverse dietary factors in different areas, structural defects of teeth, anatomical relationship of teeth, form and shape of teeth and hereditary factors.

In the present study it was observed that 47.38% of children in the urban area, and 27.94% in the rural area, had caries i.e. more prevalence in the urban areas than in the rural area. Well supported observations were of Mandal KP (2001).¹³

Difference in proportion dental caries cases according to age of children was found to be highly significant ($P < 0.001$) and observed that initially it decreases with age after the age of 8 years it decreases as age advances. These finding corresponds with the studies conducted by Dash J.K (2002)⁸ Saravanan S et al (2003)¹⁰ and Dhar V et al (2007)¹¹ who reported that caries experience and occurrence of untreated lesions in permanent teeth with age and oral hygiene status worsens as age advanced. This might be due to more prolonged exposure of teeth to the oral environment.

Sex wise distribution of students according to caries status was not found significant in urban with female predominance but in rural it was not. Similar observations were reported by B.Rai et al (2007)¹⁴ where females had more caries than males. Broca J.S.(1983)⁴ and Dhar et al (2007)¹¹ also reported no statistically significant difference in the caries prevalence between both the sexes.

Although significant association was observed in the distribution of cases according to father's education ($p=0.007$) but there was no significant association with mother's education ($p=0.368$). Education has an impact on oral health and their relationship is reciprocal.

Significant difference was found in the distribution of the cases according to the drinking water source of the family ($p < 0.001$) with lesser cases in ground water consumers than tap water.

Present study showed significant difference in the distribution of the cases according to the type of material used for cleaning of teeth ($p < 0.001$) with minimum cases in children using tooth paste and maximum cases in children either do not clean their mouth. Almost similar was observed by Girish Parmar (2006-07)¹⁵ who reported lesser cases in children using toothpaste than those who used tooth powder and neem datun in Gujarat. Fluoride, the most common active ingredient in toothpaste prevents carries.

Maximum carries cases in children who do not clean their mouth at all (49.16%) and minimum cases in children who clean their teeth more than twice per day (25%), this difference of carries cases according to frequency of cleaning was found highly significant ($p < 0.001$). These findings are in accordance with the findings of K. Pandit et al (1986)⁷ who also reported that prevalence of caries was found to increase significantly in those who do not clean their teeth regularly.

V. Conclusion

More than one third students were having dental Carries. Urban children were having significantly more dental carries than rural. Although type of families, religion, father's education, and drinking water source was not associated with dental carries but age, mouth ringing frequency, teeth cleaning material and teeth cleaning frequency were found associated in urban as well as rural areas. In urban areas sex and socio-economic status, in rural areas mother's education and dentist visit were also found to be associated with dental carries.

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Table no. 1 Comparison of Socio-demographic Factors of Dental Carries in Rural and Urban Children

S. No.	Variables	Rural (N=1600)		Urban (N=1600)	
		With Carries (n=447)	Without carries (n=1153)	With Carries (n=758)	Without carries (n=842)
Age Group					
1	5 to 7	87 (19.46)	192	110 (14.51)	147
2	8 to 10	204 (45.64)	338	360 (47.49)	196
3	11 to 13	133 (29.75)	540	261 (34.43)	428
4	14 to 16	23 (5.15)	83	27 (3.56)	71
Chi-square Test at DF		58.186 at 3 DF P<0.001 HS		109.826 at 3DF P<0.001 HS	
Sex					
	Male	246 (28.81)	608	347 (44.72)	429
	Female	201 (26.94)	545	411 (49.88)	413
Chi-square Test at DF		0.596 at 1 DF P=0.440 NS		4.667 at 1DF P=0.044 S	
Socio-economic status					
1	Upper	2 (0.45)	12	16 (2.11)	29
2	upper middle	15 (3.36)	68	66 (8.71)	110
3	lower middle	75 (16.78)	196	158 (20.84)	205
4	upper middle	250 (55.93)	615	384 (50.66)	406
5	Lower	105 (23.49)	262	134 (17.68)	92
Chi-square Test at DF		5.800 at 4 DF P=0.215 NS		24.914 at 3DF P<0.001 HS	
Religion					
1	Hindu	432 (96.64)	1114	695 (91.69)	776
2	Muslim	14 (3.13)	29	50 (6.60)	57
3	Sikh	0	5	6 (0.79)	3
4	Christians	1 (0.22)	3	3 (0.40)	4
5	Others	0	2	4 (0.53)	2
Chi-square Test at DF		3.187 at 4 DF P=0.527 NS		2.324 at 3DF P=0.676 NS	
Type of Family					
1	Nuclear	202 (45.19)	524	494 (65.17)	540
2	Joint	189 (42.28)	472	198 (26.12)	224
3	Three generation	56 (12.53)	157	66 (8.71)	78
Chi-square Test at DF		0.433 at 2 DF P=0.806 NS		0.239 at 2 DF P=0.887 NS	
Father's education (upto)					
1	Illiterate	143 (31.99)	286	134 (17.68)	249
2	Middle	167 (37.36)	453	300 (39.58)	583
3	Higher secondary	127 (28.41)	354	269 (35.49)	621
4	Graduation	8 (1.79)	45	43 (5.67)	118

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5	Post graduation	2 (0.45)	15	12 (1.580)	26
Chi-square Test at DF		13.627 at 4 DF P=0.009 S		6.460 at 4DF P=0.167 NS	
Mother's education (upto)					
1	Illiterate	355 (79.42)	803	373 (49.21)	396
2	Middle	68 (15.22)	240	266 (35.10)	300
3	Higher secondary	22 (4.92)	92	107 (14.11)	125
4	Graduation	1 (0.22)	6	11 (1.45)	18
5	Post graduation	1 (0.22)	12	1 (0.13)	3
Chi-square Test at DF		17.025 at 4 DF P=0.002 S		2.413 at 4DF P=0.660 NS	

Table no. II Comparison of Socio-demographic Factors of Dental Carries in Rural and Urban Children

S. No.	Variables	Rural (N=1600)		Urban (N=1600)	
		With Carries (n=447)	Without carries (n=1153)	With Carries (n=758)	Without carries (n=842)
Mouth Rinsing Frequency					
1	Never	220(49.22)	463	140(18.47)	120
2	Sometime	204(45.64)	626	527(69.53)	590
3	Always after meals	23(5.15)	64	91(12.01)	132
Chi-square Test at DF		10.945 at 2 DF P=0.004 S		8.243 at 2 DF P=0.016 S	
Teeth Cleaning Frequency					
1	Zero	73 (16.33)	94	44 (5.80)	27
2	<1	34 (7.61)	54	29 (3.83)	21
3	Once	246 (55.03)	676	455 (60.03)	507
4	Twice	80 (17.90)	274	212 (27.97)	262
5	> Twice	14 (3.13)	55	18 (2.37)	25
Chi-square Test at DF		33.385 at 4DF P<0.001 HS		10.193 at 4 DF P=0.037 S	
Type of Teeth Cleaning Material used					
1	Fingers	42 (9.40)	94	53 (6.99)	59
2	Tooth Paste	229 (51.23)	693	551 (72.69)	640
3	Tooth powder	30 (6.71)	95	99 (13.06)	92
4	Datun	60 (13.42)	153	8 (1.06)	19
5	Charcoal with finger	13 (2.91)	24	3 (0.40)	5
6	Don't Clean everyday	73 (16.33)	94	44 (5.08)	27
Chi-square Test at DF		27.550 at 5 DF P<0.001 HS		11.903 at 5 DF P=0.038 S	

Table III Associating factors of Dental Carries in Rural and Urban Children

S. No.	Variables	Rural Area		Urban Area	
		P Value	Level of Significance	P Value	Level of Significance
1	Age	P<0.001	HS	P<0.001	HS
2	Sex	P=0.44	NS	P=0.044	S
3	Type of Family	P=0.806	NS	P=0.887	NS
4	Religion	P=0.527	NS	P=0.676	NS
5	Father's Education	P=0.564	NS	P=0.683	NS
6	Mother's Education	P=0.005	S	P=0.686	NS
7	Socio-economic Status	P=0.215	NS	P<0.001	HS
8	Drinking Water Source	P=0.953	NS	P=0.882	NS
9	Type of Food Consumed	P=0.738	NS	P= 0.095	NS
10	Dentist's Visit	P=0.015	S	P=0.9	NS
11	BMI	P=0.015	S	P= 0.420	NS
12	Mouth Rinsing Frequency	P=0.004	S	P=0.016	S
13	Teeth Cleaning Materials	P<0.001	HS	P=0.038	S
14	Teeth Cleaning Frequency	P<0.001	HS	P=0.037	S
1	Age	P<0.001	HS	P<0.001	HS
2	Sex	P=0.44	NS	P=0.044	S
3	Type of Family	P=0.806	NS	P=0.887	NS
4	Religion	P=0.527	NS	P=0.676	NS
5	Father's Education	P=0.564	NS	P=0.683	NS
6	Mother's Education	P=0.005	S	P=0.686	NS
7	Socio-economic Status	P=0.215	NS	P<0.001	HS
8	Drinking Water Source	P=0.953	NS	P=0.882	NS

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9	Type of Food Consumed	P=0.738	NS	P= 0.095	NS
10	Dentist's Visit	P=0.015	S	P=0.9	NS
11	BMI	P=0.015	S	P= 0.420	NS
12	Mouth Rinsing Frequency	P=0.004	S	P=0.016	S
13	Teeth Cleaning Materials	P<0.001	HS	P=0.038	S
14	Teeth Cleaning Frequency	P<0.001	HS	P=0.037	S

