



## Influence of Parental Dental Anxiety on Dental Health Outcomes and Utilization of Dental Services of their Children

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### Abstract

**Objectives:** To determine the influence of parental dental anxiety of 6 -13 years old children on dental health outcomes and use of dental services.

**Methods:** A cross-sectional study was conducted on 442 children aged 6 - 13 years and their parents in Indore city, Madhya Pradesh. Simple random sampling was employed. A structured proforma was used to record demographic data and dental services utilization. World Health Organization (W.H.O.) Oral Health Assessment form (1997) was used to assess dentition status. Modified dental anxiety Scale was administered on parents to assess the parental dental anxiety. Clinical examination of children was performed to assess dentition status. Level of significance was set at 5%. Logistic regression analysis was employed.

**Results:** Only 2.26 percent of parents reported high dental anxiety (MDAS  $\geq$  19). Dental caries prevalence in children was found to be 35.75% and treatment need was 36.20%. Only 1.8% of children visited dentist previously. Parental dental anxiety (OR-0.17) and monthly income (OR-0.26) was significantly associated with utilization of dental care. Logistic regression showed children aged 6 - 9 years were having 1.8 times more chances of dental caries compared 10 -13 years odd (OR = 1.88).

**Conclusions:** Utilization of dental care was considerably low among school children of Indore. Compared to non-anxious parents, anxious parents were utilizing less dental care (OR = 0.17).

**Keywords:** Parent; Dental Anxiety; Children; Utilization; Dental Health Services.

### Abbreviations

OR - Odds Ratio; MDAS - Modified Dental Anxiety Scale; WHO - World Health Organization; SPSS - Statistical; Package for Social Sciences; p value - Probability Value.

### Introduction

Health-related practices of family members are derived through norms of the family. Through primary socialization growing child learns these norms from the parents [1]. Patterns of behavior learnt in early childhood are deeply ingrained [2] and attempts to change this behavior at later stages may be difficult [3].

Many oral health problems are preventable [4]. But dental anxiety remains a barrier for a consistent proportion of population to seek dental care [5] Estimate is that 6 - 15% of world's adult population suffers from avoidance of dental care due to high dental anxiety [6]. There is relationship between parental and child anxiety [6]. General evidence indicating that anxious parents interact differently with their children than do non-anxious parents [7,8].

Skaret, *et al.* 2003 found that dental fear is related to dental attendance [9]. In India, people encounter various obstacles in utilization of dental services such as dental anxiety, price, income, the distance a person had to travel to get care and preference for preservation of teeth [10]. However, despite the association of psychosocial factors with use of dental care services, the influence of psychosocial factors, on the use of dental services in school children is unclear. Parental characteristics, attitudes and perceptions not only influence parents' own use of dental services but also their children's use of dental services, because children depend on their parents to visit dentist [11]. Understanding parents' perceptions of their children's oral health and factors that motivate these perceptions can help dentistry overcome barriers that parents encounter in accessing dental care for their children [12]. Therefore, the present study is carried out with a research hypothesis that parental anxiety would influence the child's dental health outcomes and use of dental services.

### Methods and Materials

A cross-sectional study was conducted among 16 schools in Indore city, Madhya Pradesh for a period of seven months from January to July 2014. Ethical clearance was obtained from Institutional Review Board. Permissions for conducting the study were obtained from school authorities. Written Informed consent was obtained from the parents of each child. Children aged 6 - 13 years and their parents who are willing to participate in the study and children who are intellectually and physically capable of responding were included in the study. Children suffering from neurological or systemic diseases, acute pain or with any medically compromised condition that contra-indicates oral examination and parents and children who does not provide consent for clinical examination were excluded.

The sample size was estimated based on the data obtained from the published study on prevalence of dental anxiety on Indian populations which reported 10% prevalence of dental anxiety [13]. The minimum sample size required in the study was 345 schoolchildren. But considering that some children may be absent or miss the clinical examinations on the day of school visit, it was decided to include more than the required sample size.

Simple random sampling was employed. A provisional list of all schools was obtained from District Education Office and schools were selected randomly by lottery method. The school children in the permitted school were stratified into homogenous age groups of 6 - 13 years. In each age-group, 4 - 6 children were randomly selected ensuring equal gender representation and probability proportional to age-group size.

Training and calibration of the investigator and recorder was carried out in the Department of Public Health Dentistry, Sri Aurobindo College of Dentistry, Indore. The Kappa value (0.8) for calibration exercise showed good agreement for observations and measurement.

A structured proforma was developed to record demographic data and utilization of dental services. World Health Organization

- Oral Health Assessment form (1997) was used to assess dentition status and treatment need of children [14]. Modified Dental Anxiety Scale used to assess parental dental anxiety given by Humphris G, Morrison T and Lindsay SJE., 1995 [15].

A pilot was carried out on a convenience sample of 35 school children. The school authorities were contacted well in advance and convenient date and time for data collection was decided. On the first visit of school, the informed consent form was distributed along with proforma and MDAS questionnaire. Instructions were given to children for completing the questionnaire. Phone number of the investigator was also provided to contact for any doubts. Parents were informed that participation was voluntary. All participants were assured of confidentiality. On the next visit, oral examination was conducted on the children having informed consent from parents. The clinical examination involved an inspection of the oral cavity with plane mouth mirror and CPI probe. A trained recorder recorded the finding on the proforma. After the examination children requiring treatment were referred.

The data collected was entered in Microsoft Excel and subjected to statistical analysis using Statistical Package for Social Sciences (SPSS, IBM version 20.0). The level of significance was fixed at 5% and  $p \leq 0.05$  was considered statistically significant. Descriptive statistics was used to find the frequencies and percentage of variables considered in the study. Logistic regression analysis was performed to assess the effect of demographic variables on the dental care utilization and caries experience.

### Results and Discussion

In total 442 school children participated from 8 Government schools and 8 Private schools. Table 1 showed demographic Variables and utilization of services among Study Subjects. Only 2.26 percent of parents reported high dental anxiety (MDAS  $\geq 19$ ). Dental caries prevalence in children was found to be 35.75% and treatment need was 36.20%. Only 1.8% of children visited dentist previously.

VARIABLES n		GOVT. SCHOOLS		PRIVATE SCHOOLS		TOTAL	
		%	n	%	n	%	n
<b>Number of study subjects</b>		232	100	210	100	442	100
Age	6-9 years	103	44.4	103	49.0	206	46.60
	10-13 years	129	55.6	107	51.0	236	53.40
Gender	Male	113	48.7	122	58.1	235	53.16
	Female	119	51.3	88	41.9	207	46.84
Father Education	Illiterate	8	3.4	1	.5	9	2.03
	1-10 class	184	79.3	99	47.1	283	64.03
	11-12 class	34	14.7	62	29.5	96	21.72
	Graduation	6	2.6	48	22.9	54	12.22
Mother Education	Illiterate	52	22.4	9	4.3	61	13.80
	1-10 class	173	74.6	119	56.7	292	66.5
	11-12 class	3	1.3	61	29.0	64	14.20
	Graduation	4	1.7	21	10.0	25	5.5

Father Occupation	Govt.service	4	1.7	9	4.3	13	3.0
	Privt service	193	83.2	137	65.2	330	74.66
	Business	32	13.8	58	27.6	90	20.34
	Others	3	1.3	6	2.8	9	2.0
Mother Occupation	Govt. service	1	0.4	1	0.5	2	0.5
	Privt service	84	36.2	34	16.2	118	26.70
	Business	10	4.3	14	6.7	24	5.5
	Housewife	137	59.1	161	76.7	298	67.30
Monthly Family Income in Rs.	Less than 1000	73	31.5	19	9.0	92	20.82
	1001-10,000	135	58.2	127	60.5	262	59.28
	More then 10,000	24	10.3	64	30.5	88	19.90
Family Size	Upto 4 members	44	19.0	124	59.0	168	38.00
	Upto 6 members	135	58.2	78	37.1	213	48.19
	More than 7 members	53	22.8	8	3.8	61	13.80
Number of Siblings	No Sibling	0	0	4	1.9	4	0.90
	One sibling	42	18.1	122	58.1	164	37.10
	More than One sibling	190	81.9	84	40.0	274	62.0
Child Dental Visit	No	230	99.1	204	97.1	434	98.2
	Yes	2	0.9	6	2.9	8	1.8
Parental Dental Anxiety	Low	69	29.75	92	43.81	161	36.42
	Moderate	157	67.67	114	54.29	271	61.32
	High	6	2.58	4	1.90	10	2.26
Caries experience	Unaffected	152	65.9	132	62.4	284	64.25
	Affected	79	34.1	79	37.6	158	35.75
Treatment need	No	152	53.90	130	46.10	282	63.80
	Yes	79	34.06	81	38.57	160	36.20

**Table 1:** Demographic Variables and utilization of services among Study Subjects of Government and Private Schools.

In table 2 showed that among the independent socio-demographic variables, the initial unadjusted model indicated statistically significant odds associating the Modified dental anxiety score

and Income with utilization of dental care. Anxious parents utilized less dental services as compared to the non-anxious parents. Children with parental Income of less than Rs. 10,000 were less likely to utilize dental services.

Factors	Categories	Unadjusted odds ratio	95%CI	P value	Adjusted odds ratio	95%CI	P value
Type of School	Government	0.30	0.059-1.481	0.138			
	Private	1					
Age	6-9 years	0.68	0.161-2.892	0.604			
	10-13 years	1					
Gender	Male	1.48	0.349-6.263	0.596			
	Female	1					
Treatment need	No	1.61	0.398-6.543	0.502			
	Yes	1					
MDAS	Anxious	0.16	0.038-0.688	0.014**	0.17	0.040-0.741	0.018**
	Non-anxious	1					
Father Education in years	Less than 10	0.51	0.125-2.056	0.342			
	More than 10	1					

Mother education in years	Less than 10	0.75	0.149-3.791	0.730			
	More than 10	1					
Father occupation	Govt./ Private Service	0.29	0.069-1.141	0.076			
	others	1					
Mothers occupation	Govt./ Private Service	0.38	0.046-3.106	0.365			
	others	1					
Siblings	Less than 2	0.98	0.231-4.147	0.976			
	2 or More than 2	1					
Family Size	Upto 4 members	0.98	0.231-4.147	0.976			
	More than 4	1					
Income	Upto 10,000	0.24	0.059-0.979	0.047**	0.26	0.063-1.09	0.066
	More than 10,000	1					
Caries experience	Unaffected	1.60	0.319-8.028	0.567			
	Affected	1					

**Table 2:** Effect of independent socio-demographic variables on Utilization of dental care (dependent variable) using Bivariate regression analysis.

\*\*pvalue < 0.05: statistical significant difference.

Table 3 showed that initial unadjusted regression model indicated age, treatment need, MDAS score, number of siblings and family size to be significantly associated with caries experience (p < 0.05). Logistic regression analysis after adjusting for other variables showed that children in the age group of 6 - 9 years were with

1.8 times chances of having dental caries compared to children of age 10 - 13 years. Children with no treatment need were less likely to have dental caries compared to children with treatment need. Compared to children belonging to anxious parents, Children of non-anxious parents had less chances of having dental caries.

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Parents are primary source of information about oral health for children [16]. In our study, prevalence of high parental dental anxiety was found to be 2.2% which was similar as reported by Acharya S., 2008 [17]. Other studies on Indian population have reported higher dental anxiety prevalence. Marya CM., et al. [18] has reported 4.38% prevalence. Some of the studies have reported higher prevalence of high dental anxiety because of the cut off score used to classify the subjects with high Anxiety on scale 5 - 25 on MDAS Score. Few studies had considered a middle value of 15 as a cut off there by clubbing the moderately and high anxiety group [19]. Humphris GM., et al. [15], the authors of Modified Dental Anxiety Scale has suggested score of ≥ 19 to be considered as highly anxious subjects.

In our study caries prevalence was 35.75%. The National oral health status and fluoride mapping survey in 2002 have reported a dental caries prevalence of 61.7% in 12 years age-group among Indore population [20]. Similarly, some dental caries studies conducted on isolated population in India have reported higher caries prevalence of 56 - 81% in 5 to 12 years old children [21,22]. The caries experience among the study population of present study was considerably less. The reason may be that some school may be in endemic fluoride region.

About 36.20% of study population were having dental treatment need in our study. However, Dhar V., et al. 2009 [22] reported 85.07% of the total children needed treatment. The treatment need was more than the caries prevalence because some children require pit and fissure sealant application to protect the deep fissures from caries. Considering the caries prevalence, the utilization of dental services was very low among the study population. The reason may be the small number of caries lesions or the lesions were not deep enough to produce pain, sensitivity or other functional limitation in patients.

Results of our study indicate that family income and parental anxiety are significantly associated with utilization of dental services. This finding is similar to the results of Devaraj CG., et al. (2011) who reports that factors like place of resident and monthly income was associated with dental service utilization in India [23].

Some of the possible limitation of the study is the fact that parents answered the questionnaires (proxies) and it may not clearly reflect the children’s feeling and conditions. The study had focused on the dental anxiety of parents and the personal anxiety level of either parents or the child towards dental treatment may differ. Social desirability bias should also be considered that might have played a role in lower scoring on Modified Dental Anxiety Scale. Parents may not provide the higher MDAS score as not wanting to show their dental anxiety in front of children or other parent.

**Conclusions**

There is need to create awareness among Indore population about oral health problems, need and availability of the dental care. Programs towards preventive oral health care and Efforts to reduce the dental anxiety level among the parents and children should be carried out. Further studies should be conducted to identify factors responsible for underutilization of dental care and essential steps should be undertaken to improve dental care utilization among the Indore population.

**Conflict of Interest**

No conflict of interest exists.

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