

Correlation between Odontophobia and Dental Caries in 7-14 Years of Age Group

Swapnil Oza^{1*} Rajat Varshney² Kashish Mangal³ Kritika Mody⁴ Garima Gaur⁵ Sneha Jhaveri⁶

¹Senior Lecturer, Department of Public Health Dentistry, Darshan Dental College and Hospital, Udaipur, India.

²Reader, Department of Oral & Maxillofacial Pathology, Darshan Dental College and Hospital, Udaipur, India.

³Under Graduate Student, Darshan Dental College and Hospital, Udaipur, India.

⁴Under Graduate Student, Darshan Dental College and Hospital, Udaipur, India.

⁵Under Graduate Student, Darshan Dental College and Hospital, Udaipur, India.

⁶Under Graduate Student, Darshan Dental College and Hospital, Udaipur, India.

ABSTRACT

Background: Existence of dental fear and anxiety is very common. Dental fear has also been reported as one of the most important reasons for avoidance and negligence of regular dental care. Therefore, the present study was aimed to evaluate and assess the dental anxiety and dental caries in school children from Udaipur, India to document evidence on these two critical factors.

Methodology: A cross sectional survey was conducted among 360 school children from 5 schools which are located in five different zones (East, West, North, South and Central) of the city. Informed consent was obtained. To record the fear, self recorded Children's Fear Survey Schedule – Dental Subscale (CFSS-DS) Scale was used. A self-constructed questionnaire was also used to gather information regarding knowledge about dentist, previous dental visits (if any) and oral hygiene habits. Along with this, DMFT and DMFS indices were recorded for each individual to assess the caries status.

Results: The response rate was 99.9%. The mean age was 9.40 years. Group 1 had strength of 234 whereas Group 2 included 126 students making a total of 360 participant turnout. The CFSS-DS questionnaire consisted of 15 items in it, so, children were interviewed on the same aspects. When asked about fear from dentist 165(45.8%) of the students were anxious in a fair amount (score 3). The values presented a significant difference (Group1=117 i.e. 50%; Group2=42 i.e. 33.3%) (P=0.000). DMFT scores inferred in present study were 288 (80%) children came under LCG- Low Caries Group (Group1=207, 88.5%; Group2= 81, 64.2%) and 72 (20%) came under HCG- High Caries Group (Group1=27, 11.5%; Group2=45, 35.8%) shows significant different (P=0.000).

Conclusion: From the observations attained and analyzed, it can be concluded that dental anxiety remains same or may decrease with increasing age but caries frequency increases significantly with advancing age due to underutilization of preventive dental care because of dental fear in early childhood age.

Keywords: School children, dental fear, dental caries.

INTRODUCTION

Oral disease burden is an unsolved global problem. Oral ailments include Odontocavum (dental caries), periodontal diseases, edentulousness, oral cancers and human

immunodeficiency virus (HIV) related oral conditions which have a profound effect on overall general health¹. Dental diseases are detrimental to the quality of life². The increasing prevalence of dental diseases is associated with a number of

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*Correspondence Dr. Swapnil Oza.

Department of Public Health Dentistry, Darshan Dental College and Hospital, Udaipur, India.

Email: swapniloza9@gmail.com

barriers such as lack of access, poor awareness, limited resources and healthcare budgets as well as anxiety related to dental treatment³.

In children, the existence of Odontophobia (dental fear and anxiety) are very well known⁴. Dental fear has been ranked fourth among common fears⁵. Its intensity varies from nervousness and anxiety to dental phobia. Dental fear has also been reported as one of the most important reasons for avoidance and negligence of regular dental care⁶. According to American Psychological Association's Diagnostic and Statistical Manual IV⁷, phobia is classified as an anxiety disorder covering symptoms such as constant fear of stimulus, avoidance of feared objects, and significant disruption of routine activities, limiting the functions of an individual due to exaggerated and unreasonable anxiety. Several researchers group dental phobias into situational and blood injection injury types of phobia. Dental anxiety, by contrast, relates to the psychological and physiological variations of a non-pathological fear response to a dentist's appointment or treatment⁸⁻¹⁰.

Several researchers have concluded that dental anxiety varies in different social groups and tribes¹¹. Age, sex, social status and education level also significantly affect anxiety, with younger individuals and women showing higher levels of anxiousness¹²⁻¹⁴. The family environment, dentist experiences shared by others, and literacy level also affect anxiety to varying degrees. The role of culture is inextricable in oral practices. In Indian population, for example, literacy level is low, social status is poor, general cleanliness is compromised; dental awareness is lagging¹⁵⁻¹⁷. Visiting a dentist is one of the rarest norms and is routinely postponed until a serious symptom appears. In such a scenario, attending to anxiety among patients adds to the burden and effectiveness of dental fraternity¹⁸. Therefore, the present study was aimed to evaluate and assess the dental anxiety and dental caries in school children from Udaipur, India to document evidence on these two critical factors.

MATERIALS AND METHOD

A cross sectional survey was conducted among the school children in Udaipur, India. The first objective was to determine the degree of anxiety among school students pertaining to dental

treatment. The second objective was to study the prevalence of dental caries in the mixed dentition age group.

Sample

The sample population consisted of 360 school students from 5 schools of the five zones (East, West, North, South and Central) of Udaipur, India. Ethical approval was obtained from the ethical committee of Darshan Dental College and Hospital, Udaipur, India. Informed consent was obtained from each student. The children were divided in two groups i.e. 'Group 1' comprising of students of 7-9 years of age and 'Group 2' in which students of 10-14 years of age were included.

Inclusion Criteria

1. Healthy children who attended the school, aged between 7 years to 14 years with or without any previous dental experience.
2. Children who had presented a signed consent form

Exclusion Criteria

1. Children below 7 years or above 14 years of age.
2. Children with any disabilities.

Instrument

The current study employed the Children's Fear Survey Schedule – Dental Subscale (CFSS-DS) developed by Cuthbert and Melamed in 1982¹⁹. It is a well-known instrument for assessment of dental fear in children and has been translated into several languages and has been used to assess the level of dental fear of children in a number of studies⁶. CFSS-DS was preferred because it possesses better psychometric properties, it measures dental fear more precisely, and it covers more aspects of dental situation than other questionnaires. Reliability of CFSS-DS is very high ($r = 0.97$).

In addition, a self-constructed questionnaire was also used to gather information regarding knowledge about dentist, previous dental visits (if any) and oral hygiene habits. Along with this DMFT and DMFS indices were recorded for each individual to assess the caries status quotient.

Procedure

Since most of the children had difficulty in reading, writing and understanding English, they were interviewed on the devised questionnaire including the 15 items of CFSS-DS scale. To minimize inter-examiner variance, single examiner along with one recorder was appointed to mark the child's responses in the questionnaire. Sterilized mouth mirrors and explorers were used to record DMFT and DMFS indices in children in natural sun light.

RESULTS

The response rate was 99.9%. The mean age was 9.40 years. Group 1 had strength of 234 students whereas Group 2 included 126 students making a total of 360 participant turnout.

Table1 shows the self-constructed questions asked to each student out of which question no. 6 to 8 were to be evaluated by the interviewer based on the overall behavior and attitude of the child towards the questions. Each of the 8 questions was answered as 'Yes' or 'No'.

The CFSS-DS scores were evaluated with a cut off score of 38. Thus, children with score below or equal to 38 were categorized as Low Anxious Children (LAC) and those with scored above 38 were Highly Anxious Children (HAC). We inferred that, 96 (26.5%) were LAC (Group1= 66 i.e. 28.2%; Group 2=30 i.e. 24%) whereas 264 (73.2%) came under HAC (Group1= 168 i.e. 71.8%; Group2= 96 i.e. 76%). Thus, a significant difference between the values was found ($P=0.000$). The CFSS-DS questionnaire consists of 15 items in it, so, children were interviewed on the same aspects. When asked about fear from dentist 165(45.8%) of the students were anxious in a fair amount (score 3). The values presented a significant difference (Group1=117 i.e. 50%; Group2=42 i.e. 33.3%) ($P=0.000$). On asking about fear from doctors in general 153(42.5%) students were anxious in a fair amount (score3). The values differed significantly (Group1=108 i.e. 46.2%; Group2=33 i.e. 26.2%) ($P=0.000$). Fear from injections was rated as fair amount (score3) by 189 (52.5%). The difference in the values were non-significant ($P=0.135$) between the two groups (Group1=120 i.e. 51.3%; Group2=69 i.e. 54.8%). 132 (36.7%) of the total participants were anxious

in a fair amount from someone examining their mouth and values were non-significantly different ($P=0.175$) between the two groups (Group1= 84 i.e. 35.9%; Group2=48 i.e. 38.1%). A total of 144 (40.0%) of the participants were fairly anxious from opening their mouth, the difference in the values being non-significant (Group1=93 i.e. 39.7%; Group2=51 i.e. 40.5%) ($P=0.093$). A stranger's touch accounted for a score of 2 i.e. a little afraid by 147 (40.8%) children, the difference of the values being significant ($P=0.002$) amongst the groups (Group1=111, 47.4%; Group2=36, 28.6%). 144(40.0%) of the children were a little afraid if a stranger looked at them, the difference in the values being significant (Group1=105, 44.9%; Group2=39, 31.0%) ($P=0.006$).

The fear of a dentist using instruments for drilling was marked as score 4 (pretty much afraid) by 165 (45.8%), the difference in the values being a significant one (Group1=102, 43.6%; Group2=48, 38.1%) ($P=0.001$). The sight of the same yielded the similar score of 4 (pretty much afraid) by 204 (56.7%), the difference being significant ($P=0.000$) in the groups (Group1=102, 43.6%; Group2=33, 26.2%). But the noise of the instruments used to drill by a dentist was marked for a score 3 (a fair amount of anxiety) by 174 (48.3%), the difference is significant (Group1=108, 46.2%; Group2=33, 26.2%) ($P=0.000$). When children were asked to rate their fear of someone putting instruments in their mouth 168 (46.7%) of them were anxious in a fair amount (score-3), the ($P=0.005$) making the difference significant between group1 (60, 25.6 %) and group2 (54, 42.9%). Majority i.e. 156 (43.3%) of participants were a little afraid (score-2) of choking or gagging during a dental procedure, significant difference ($P=0.012$) was seen in values (Group1=114, 48.7%; Group2=42,33.3%). 153 (42.5%) of the total participants were a little afraid of having to go to the hospital, the difference were non-significant ($P=0.489$) (Group1=93, 39.7%; Group2=42,33.3%). People in white uniform made 165 (45.8%) of the children anxious in a fair amount, the difference were non-significant ($P=0.121$) (Group1=108,46.2%; Group2=57, 45.2%). The fear of a dentist cleaning teeth was rated as score 3 (a fair amount of fear) by 174 (48.3%) children, the difference in the values were non-significant ($P=0.677$) between the groups (Group1=84, 35.9%; Group2=42, 33.3%).

In the DMFT and DMFS indices, result was calculated using a cut off score. The cut off scores for DMFT and DMFS indices were 3 and 4 respectively. So children with DMFT or DMFS score below or equal to the cut off score were classified as Low Caries Group (LCG) and those with score above the cut off score were categorized as High Caries Group (HCG). From the results of DMFT scores inferred in present study was 288 (80%) children came under LCG (Group1=207, 88.5%; Group2= 81, 64.2%) and 72 (20%) came under HCG (Group1=27, 11.5%; Group2=45, 35.8%). The difference in the values is significant (P=0.000). In the DMFS index

we found that 283 (78.6%) children could be classified as LCG (Group1= 204, 87.3%; Group2= 79, 62.6%) whereas 77 (21.4%) made the HCG (Group1= 30, 12.8%; Group2=47, 37.4%). Here also the difference in the values was seen to be significant (P=0.000). Thus, from the above observations it can be inferred that with increase in age no significant changes are seen in anxiety levels but caries prevalence increases significantly. Therefore odontophobia i.e. anxiety levels in children have a positive correlation or in other terms is directly proportional to caries prevalence and age of the child.

Table 1: Shows comparison between groups based on overall behavior and attitude of the child towards the questions.

S.N	QUESTIONS	GROUP-1 n = 234 (%)		GROUP-2 n = 126 (%)		P-VALUE
		Yes	No	Yes	No	
1.	Do you know about dentist?	33 (14.1)	201(85.9)	33 (26.2)	93 (73.8)	0.005*
2.	Have you ever been to a dentist?	33 (14.1)	201(85.9)	30 (23.8)	96 (76.2)	0.021*
3.	Do you brush your teeth daily?	159(68)	75 (32)	78 (61.9)	48 (38.1)	0.249
4.	Are you happy with your oral hygiene?	108(46.2)	126(53.8)	39 (31)	87 (69)	0.005*
5.	Do you want to get treated for better oral hygiene?	105(44.9)	129(55.1)	51 (40.5)	75 (59.5)	0.293
6.	The child was cooperative?	132(56.4)	102(43.6)	69 (54.8)	57 (45.2)	0.764
7.	The child was anxious about questions?	171(73)	63 (27)	96 (76.2)	30 (23.8)	0.520
8.	The child understood questions?	105(44.9)	129(55.1)	54 (42.9)	72 (57.1)	0.714

DISCUSSION

Fear can be considered as an inevitable thrilling response to a certain external threat and with an identified origin in which individual is afraid without clear reasons¹⁹.

The entire arrangement of dental treatment is scary to patients, starting from sitting in a dental chair to receiving the required treatment¹⁷. In addition to the perceived anxiety a marked reduction in patient's cooperation and compliance is noticed that may jeopardize the success of treatment. Even worse, this fear may make the patient apprehensive to undergoing the eminent dental treatments²⁰.

There have been very few researches and studies correlating the level of anxiety and fear in children in relation to dental procedures in India. Also the studies performed earlier did not record any such data from Udaipur, Rajasthan (India). Current study enlightens this correspondence of the above mentioned aspects in the mixed dentition age group.

Present study showed decrease in anxiety level but increase in caries frequency with advancing age. These results were not on agreement with an earlier study performed in other parts of India²¹. Also, they were not in accordance with the reports of Lee CY et al²², Stenebrand A et al²³ and Rantavuori K et al²⁴ which shows an increase in anxiety level and increase in caries frequency with

advancing age. The higher score in the older children may be justified to the fact that their interfaces with dental treatment were not the pleasant ones in early age. Present study shows that higher anxiety scores are possibility of confounding factors can be considered. These factors may be the increasing frequency of dental caries and thus greater number of invasive treatments with age shows similar results²⁵. Like another study done by Klingberg G et al²⁶ similar results were reported in present study that decrease in anxiety occurs as child matures probably due to losing the 'Fear of Unknown'.

As compare to other studies present study was also conducted in different areas of the city, so a possible explanation for increased dental fear may be due to the different types of dental treatment received²⁷ and/or due to the differences in the type of dental services provided²⁸. For example, in schools away from the main land city areas, dental services are most commonly provided by the mobile dental units whereas the schools closer to the heart of city have the benefit of having dental clinics in the nearby areas²⁹.

Limitation of the study was that no comparison was made between genders and only a narrow age group was selected for the study, also the present study was carried out in Udaipur, Rajasthan which is predominantly surrounded by rural tribes where the patients are not exposed to/unaware of preventive measure and most of these patients expressed a negative attitude about general and dental health.

CONCLUSION

From the observations attained and analyzed, it can be concluded that dental anxiety remains same or may decrease with increasing age but caries frequency increases significantly with advancing age due to under utilization of preventive dental care because of dental fear in early childhood age.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Peterson PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risk to oral health. Bulletin of the World Health Organisation. 2005; 83: 661-9
2. Kelly M, Steele J, Nuttall N, Bradnock G, Morris J, Nunn J, *et al* (1998) Adult dental health survey. Oral health in the United Kingdom. London; the stationary office, 2000.
3. Shahbano Syed, Sobia Bilal, NarendraDawani, KulsoomRizvi. Dental anxiety among adult patients and its correlation with self assessed dental status and treatment needs. JPMA 63: 614; 2013
4. NS VekateshBabu, SmritiJha. Assessment of the role of preparatory information on children's anxiety levels before and after dental procedure. International Journal Of Scientific Study, 2015
5. Milgrom P, Weinstein P (1993). Dental fears in general practice: New guidelines for assessment and treatment. Int. Dent. J., 43:288-293.
6. Chellappah NK, Vignehsha H, Milgrom P (1990). Prevalence of dental anxiety and fear in children in Singapore. Community. Dent. Oral epidemiol., 18:269-271
7. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. Washington DC: American Psychiatric Association; 1994.
8. Armfield JM, Spencer AJ, Stewart JF. Dental fear in Australia: who's afraid of the dentist? Aust Dent J 2006, March; 51(1): 78-85.
9. Vika M, Skarat E, Raadal M, *et al*. Fear of blood injury and injections and its relationship to dental anxiety and probability of avoiding dental treatment among 18 years old in Norway. Int J Paediatr Dent 2008 May; 18(3): 163-9
10. Wolitzky-Taylor KB, Horowitz JD, Powres MB, *et al*. Psychological approaches in the treatment of specific phobias: A meta-analysis. ClinPsycholo Rev 2008 Jul; 28(6): 1021-37.

11. De Jongh A, Muris P, Ter Horst G, *et al.* One session treatment of dental phobia: Preparing dental phobics for treatment by restructuring negative cognitions. *Behav Res Ther* 1995 Nov; 33(8): 947-54.
12. Corah NL. Development of dental anxiety scale. *J Dent Res* 1969 Jul-Aug; 48(4): 596.
13. Thomson WM, Stewart JF, Carter KD, *et al.* Dental anxiety among Australians. *Int Dent J* 1996 Aug; 46(4): 320-4.
14. Ragnarsson E. dental fear and anxiety in an adult Icelandic population. *Acta Odontol Scand* 1998 April; 56: 100-4.
15. Jain R, Jhanjee S, Jain V, *et al.* a double-blind placebo-controlled randomized trial of varenicline for smokeless tobacco dependence in India. *Nicotine Tob Res* 2014 Jan; 16(1): 50-7.
16. Singh RD, Haridas N, Shah FD, *et al.* Gene polymorphisms, tobacco exposure and oral cancer susceptibility: A study from Gujarat west India. *Oral disease* 2014 Jan; 20(1): 84-93.
17. Majumdar R, Raje SS, Dandelkar A. Socio demographic factor associated with tobacco use in rural Maharashtra. *Medical Journal of Dr. DY Patil University* 2013 Apr; 6(2): 161-4.
18. Rahul Bhola, Reema Malhotra. Dental Procedures, oral practices and associated anxiety: A study on late teenagers. *Osong Pub Health Res Perspect* 2014; 5(4): 219-232.
19. Cuthbert MT, Melamed BG. A screening device: children at risk for dental fears and management problems. *ASDC J Dent Child* 1982; 49: 432-436.
20. Ten Berge M, Veerkamp JS, Hoogstraten J, *et al.* childhood dental fear in the Netherlands: Prevalence and normative data. *Community Dent Oral Epidemiol* 2002; 30: 101-107
21. Deepak Vishwanath, Anumula Vamsi Krishna. Correlation between dental anxiety, sense of coherence (SOC) and dental caries in school children from Bangalore North: A cross-sectional study. *Journal of Indian Society Of Pedodontics And Preventive Dentistry*
22. Lee CY, Chang YY, Huang ST. Prevalence of dental anxiety among 5- to 8-year-old Taiwanese children. *J Public Health Dent* 2007; 67: 36-41.
23. Stenebrand A, Wide Boman U, Hakeberg M. Dental anxiety and temperament in 15-year olds. *Acta Odontol Scand* 2013; 71: 15-21.
24. Rantavuori K, Lahti S, Hausen H, Seppä L, Kärkkäinen S. Dental fear and oral health and family characteristics of Finnish children. *Acta Odontol Scand* 2004; 62: 207-13
25. Tickle M, Jones C, Buchannan K, Milsom KM, Blinkhorn AS, Humphris GM. A prospective study of dental anxiety in a cohort of children followed from 5 to 9 years of age. *Int J Paediatr Dent* 2009; 19: 225-32.
26. Klingberg G, Broberg AG. Dental fear/anxiety and dental behavior management problems in children and adolescents: A review of prevalence and concomitant psychological factors. *Int J Paediatr Dent* 2007; 17: 391-406.
27. Milsom KM, Tickle M, Humphris GM, Blinkhorn AS. The relationship between anxiety and dental treatment experience in 5-year-old children. *Br Dent J* 2003; 194: 503-6
28. Othman L, Jaafar N. A survey of customer satisfaction with the school dental service among 16-year-old schoolchildren in the district of Tawau, Sabah [monograph]. Kuala Lumpur, Malaysia: Oral Health Division, Ministry of Health and University of Malaya; 2004.
29. Othman N, Razak IA. Satisfaction with school dental service provided by mobile dental squads. *Asia Pac J Public Health* 2010; 22: 415-25.