

# Knowledge, Attitude and Aesthetic Perceptions about Dental Fluorosis among 12-15 Years Old Government School Children in Farukh Nagar, Haryana

Yadav R<sup>1</sup>, Yadav A<sup>2</sup>, Oberoi SS<sup>3</sup>

## ABSTRACT

**Aims and objectives:** The present study was conducted to assess the opinions amongst schoolchildren about the appearance of dental fluorosis, to correlate the children's perceptions of dental fluorosis and to assess the impact of dental fluorosis on psychological health of the school children.

**Materials and methods:** A questionnaire was used for assessment of the Knowledge, Attitude and Aesthetic perceptions about Dental Fluorosis among 474, 12-15 years old school children studying in four government high schools of Farukh Nagar block, Gurgaon, Haryana. The study sample included 308 students with dental fluorosis out of all the school children examined. Dental Fluorosis was assessed by using tooth surface index of fluorosis with 8 point scale ranging from 0 to 7.

**Results:** Amongst 308 subjects, maximum subjects had TSIF score of 4, 96.8% (298) subjects were not aware of the term fluorosis, 276 (89.5%) subjects were worried, and 253 (82.2%) subjects were not able to smile freely because of the appearance of their teeth.

**Conclusion:** The study showed that dental fluorosis had severe impact on the 12 to 15 years old school children especially on the subjects with TSIF score of 4 because of the staining.

**Keywords:** Dental Fluorosis, Aesthetic Perceptions, Knowledge, School Children.

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<sup>1</sup> Senior Lecturer  
NIMS Dental College, Jaipur, Rajasthan, INDIA

<sup>2</sup> Senior Lecturer  
NIMS Dental College, Jaipur, Rajasthan, INDIA

<sup>3</sup> Reader  
Sudha Rustagi College of Dental Sciences and  
Research, Faridabad, Haryana, INDIA

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## Contact Author

Dr. Roma Yadav  
drromayadav@yahoo.com

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## INTRODUCTION

No matter how much everyone would like to emphasize on the importance of inner beauty, we cannot deny that physical looks matter as well. There is something about looking good that we all want to be a part of. It may be the confidence that it gives or the fact that people treat you better when you are physically attractive. It is not any different with white teeth and it is also documented that People afflicted with dental fluorosis are more likely to experience discrimination from an early age. Teach-

ers often prejudice a child's intellect and personality based on appearance alone. These children are more often likely to be considered as troublemakers or non-scholars. Such biased views reinforce a negative stereotype, with self-fulfilling results (1).

Nearly 12 million of the 85 million tons of fluoride deposits on the earth's crust are found in India. And it is not surprising; that out of 29 states in India, dental fluorosis is endemic in 15 states. The highest rates of endemicity have been reported from Andhra Pradesh,

Haryana, Karnataka, Punjab, and Tamil Nadu (2).

Dental fluorosis can have significant psychological impact on patients — particularly on adolescents, who may be subjected to much unkind teasing.” The resulting impact on self-esteem can have long-lasting effects on an individual’s emotional and mental health. In 1985, following a review commissioned by the United States Environmental Protection Agency, an independent panel of behavioural scientists found that people with moderate to severe fluorosis are at increased risk of experiencing psychological and behavioural problems (3,4).

Few studies have been conducted to assess the aesthetic perceptions about dental fluorosis in India. So, the present study would be an attempt to assess the knowledge, attitude and aesthetic perceptions about dental fluorosis among 12-15 years old school children and to establish a reliable baseline data for development of plans to form national and regional defluoridation programmes.

**MATERIALS AND METHODS**

The cross sectional epidemiologic study was conducted among the 12-15 years old school children studying in four government high schools of Farukh Nagar block, Gurgaon, Haryana. Gurgaon district is divided into four blocks- Pataudi, Sohna, Gurgaon city and Farukh Nagar. Among these, Farukh Nagar block was selected simple random sampling. The details of the survey along with the letter from the principal, SGT Dental College, Hospital and Research Institute were provided to the Block Education Officer, Farukh Nagar to obtain the list of schools and permission to visit the schools for the survey.

As per the data available from the block education officer, there are 8 Government high schools in Farukh Nagar block and out of which 4 schools were selected randomly for the study. 474 students (12-15 years old), were

screened for dental fluorosis, and total of 308 students with fluorosis were included in the study. Permission to examine the students of Government High Schools were taken from and the Principals of the concerned schools. Ethical clearance was obtained from the ethical committee of SGT Dental College, Hospital and Research Institute.

**Inclusion criteria**

- Children with fully erupted maxillary anterior teeth.
- Children who were born and brought up in the same village.
- Exclusion criteria
- Children with missing maxillary anterior teeth.
- Children undergoing any type of orthodontic treatment.
- Children with any type of restorations
- Children with decayed anterior teeth
- Children with non fluoride enamel opacities.
- Children with severe malformations of teeth.
- Children with obvious malocclusion which causes hindrance in examination.

**CLINICAL EXAMINATION**

The examination was done by the investigator who was assisted by a recording assistant. The examiner and the recording assistant both were trained and calibrated under the guidance of Head of Department of Public Health Dentistry, SGT Dental College, Hospital and Research Institute. The respective class teachers were used as coordinators for the organization of the survey.

The subjects were examined using the ADA type III clinical examination method (5). The assessment of Dental Fluorosis was done by Tooth Surface index of Fluorosis (TSIF) with 8 point scale ranging from 0 to 7 (6). The most severely affected tooth (worst TSIF score) was used to identify the overall severity of fluorosis.

**QUESTIONNAIRE**

The questionnaire consisted of 2 parts in which the first part consisted of General Information like personal details, patient’s age, sex, source of water. The second part of Questionnaire included the questions regarding knowledge, attitude and aesthetic perceptions derived from dental fluorosis.

It consisted of eleven questions. 6 questions were used for assessing the perceptions about dental fluorosis, 2 questions were used for assessing the attitude and 3 questions were used for assessing the knowledge about dental fluorosis. The questionnaire was translated into Hindi for the ease and convenience of the students.

**STATISTICAL ANALYSIS**

Data was compiled and analyzed using statistical package for social sciences (SPSS) package, version 17. The Frequency and percentage distribution of subjects was calculated question wise based on responses of the subjects. The Chi square test was used to find the association between the general socio-demographic variable like age, sex and other variables. A p-value of d” 0.05 was considered to be statistically significant.

**RESULTS**

The study population comprised of 308, 12 to 15 year old school children. Amongst these 73 (23.7%) were 12 years old, 83 (26.9%) were 13 years old, 77 (25%) were 14 years old and 75 (24.3%) were 15 years old. (Table-1). Amongst the total subjects, 143 (46.4%) were males and 165 (53.6%) were females. 51 (16.6%) males and 61 (19.8%) had the maximum score of 4 (Table 2).

Maximum subjects 4. 25 (8.1%) subjects had the TSIF Score of 1, 47 (15.3%) subjects had the TSIF score of 2, 42 (13.6%) subjects had the TSIF score of 3, 112 (36.4%) subjects had the TSIF score of 2, 46 (14.9%) subjects had the TSIF score of 5, 29 (9.4%) subjects had the TSIF score of 2, 7 (2.3%) subjects had the TSIF score of 7 (Figure-1). Only 10 (3.2%) subjects were aware of the term fluorosis, 298 (96.8%) subjects were not.

**Table 1: Distribution of the study population according to age**

GENDER	TSIF SCORES							TOTAL
	1	2	3	4	5	6	7	
12 years	7	14	12	20	13	6	1	73
	9.6%	19.2%	16.4%	27.4%	17.8%	8.2%	1.4%	100.0%
13 years	3	12	13	36	9	10	0	83
	3.6%	14.5%	15.7%	43.4%	10.8%	12.0%	.0%	100.0%
14 years	10	15	8	28	7	5	4	77
	13.0%	19.5%	10.4%	36.4%	9.1%	6.5%	5.2%	100.0%
15 years	5	6	9	28	17	8	2	75
	6.7%	8.0%	12.0%	37.3%	22.7%	10.7%	2.7%	100.0%
Total	25	47	42	112	46	29	7	308
	8.1%	15.3%	13.6%	36.4%	14.9%	9.4%	2.3%	100.0%

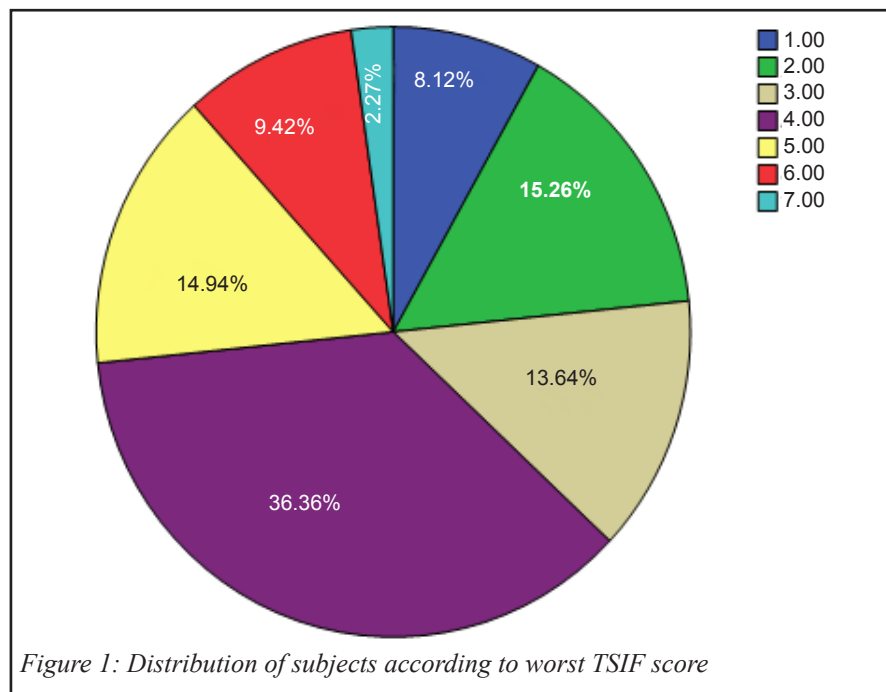
**Table 2: Distribution of the study population according to Gender**

GENDER	TSIF SCORES							TOTAL
	1	2	3	4	5	6	7	
MALES	13	27	18	51	22	11	1	143
	4.2%	8.8%	5.8%	16.6%	7.1%	3.6%	.3%	46.4%
FEMALES	12	20	24	61	24	18	6	165
	3.9%	6.5%	7.8%	19.8%	7.8%	5.8%	1.9%	53.6%
TOTAL	25	47	42	112	46	29	7	308
	8.1%	15.3%	13.6%	36.4%	14.9%	9.4%	2.3%	100.0%

Amongst subjects, 31 (10.1%) agreed strongly and 65 (21.1%) agreed and found their teeth to be appealing while 131 (42.5%) disagreed and 35 (11.4%) strongly disagreed and did not find their teeth to be appealing. It was greatest in the subjects with TSIF scores of 4 (Figure-2).

When asked about the reason for the appearance of the teeth, 22 (7.1%) reported food to be the cause, 178 (57.8%) reported poor oral hygiene, 42 (13.6%) reported poor water quality, 46 (14.9%) reported tea/coffee and 20 (6.5%) reported other reasons to be the cause of such appearance of their teeth.

Among the subjects, 281 (91.2%) were embarrassed by the appearance of their teeth some or the other time and especially those who had the greatest TSIF



*Figure 1: Distribution of subjects according to worst TSIF score*

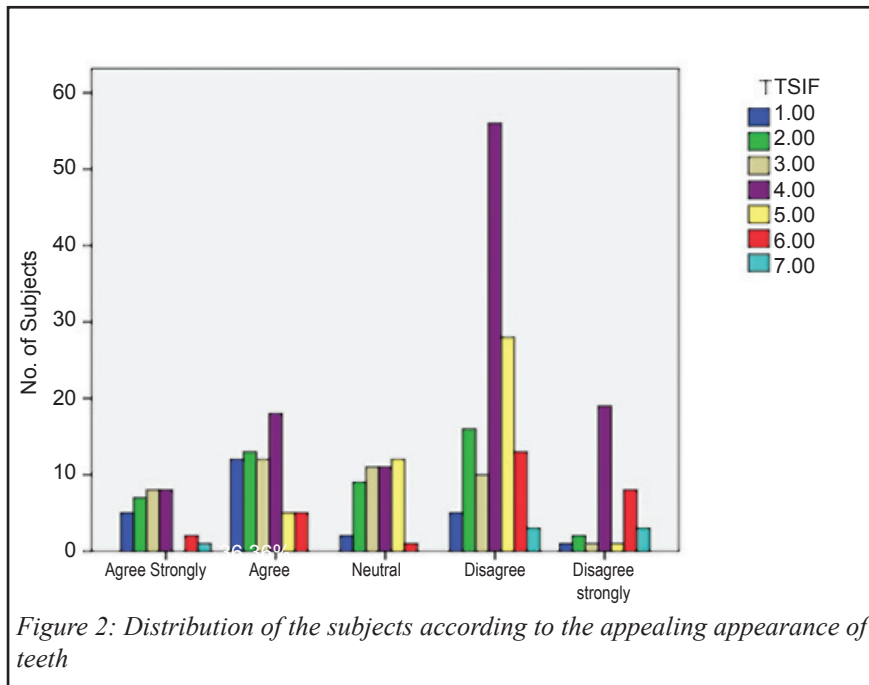


Figure 2: Distribution of the subjects according to the appealing appearance of teeth

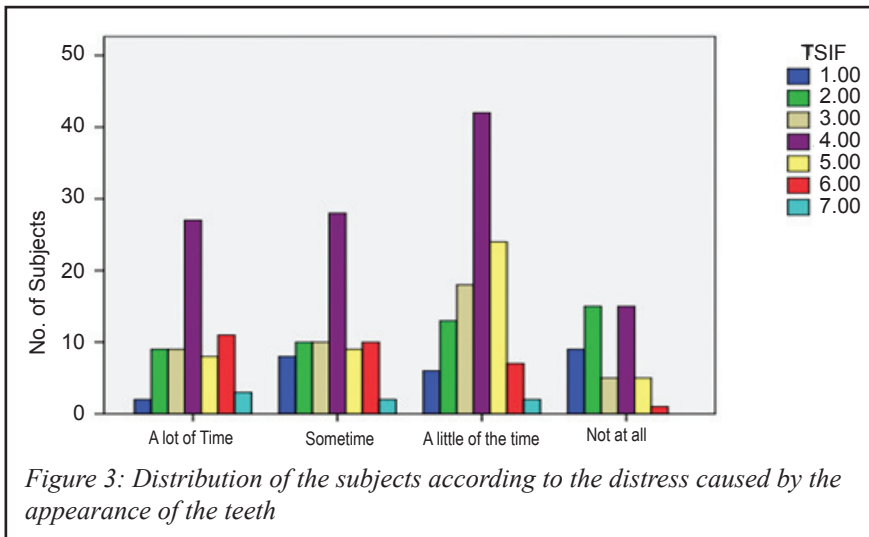


Figure 3: Distribution of the subjects according to the distress caused by the appearance of the teeth

score of 4 were more embarrassed than others while 27 (8.8%) were not embarrassed at all, 258 (83.8%) were distressed by the appearance of their teeth some or the other time and especially those who had the greatest TSIF score of 4 and 50 (16.2%) were not distressed at all (Figure-3).

Amongst study subjects, 276 (89.5%) subjects were worried, 253 (82.2%) subjects were not able to smile, 229 (74.3%) prevented themselves from attending social gatherings because of the appearance of their teeth.

Out of total, 114 (37%) subjects consulted the dentist regarding the appearance of their teeth while 194 (63%) subjects did not, 268 (87.3%) subjects showed their willingness to get the treatment done for the appearance of their teeth. The Willingness for treatment was greatest in the subjects with the TSIF score of 4 followed by score 5.

**DISCUSSION**

The present study was carried out to assess the Knowledge, Attitude and Aesthetic perceptions about Dental Fluorosis among 12-15 years old Gov-

ernment School children in Farukh Nagar, Haryana. A total of 474 students were screened for dental fluorosis, and 308 school children with fluorosis were included in the study.

In the present study, 12 to 15 years old school children with dental fluorosis formed the study population as this is the age when children enter in their teenage and are more critical about their looks. Moreover, 12 and 15 years are the index ages chosen by the WHO for global comparison. Peres KG et al (7) and Meneghim MC et al (8) conducted studies among 12 year old children.

Fluorosis was assessed by tooth surface index of fluorosis (TSIF) with 8 point scale ranging from 0 to 7. This index was used as it is more sensitive than Dean’s index at higher degrees of fluorosis with separate scores for staining, discrete and confluent pitting. This index also takes staining into consideration as it does not require drying of the teeth before examination Rozier RG (9). The results of the present study showed that only 10% subjects were aware of the term dental fluorosis and 178 (57.8%) subjects reported poor oral hygiene to be the major cause of such appearance followed by the staining with tea or coffee. This can be because of the poor or no knowledge of dental fluorosis among school children.

In the present study, 166 (53.5%) did not find their teeth to be appealing. McKnight CB (10) also found the fluorotic teeth to be less aesthetic. Feelings of distress, embarrassment, worry and hindered smiling due to dental fluorosis were expressed by children and more so among those with TSIF score of 4 and above. The findings of present study are similar to the findings of studies conducted by Riordan PJ (11), Clark DC et al (12) and Bhagyajyothi CR (13). 91% of the children in the most severe dental fluorosis group responded that they were hindered from smiling freely in a study conducted by Van Palenstein Helderman WH and Mkasabuni E (14).

It was observed that subjects with TSIF score of 1 and 2 were also embarrassed, distressed and worried Clark DC (15) also observed that milder forms of dental fluorosis may occasionally produce aesthetic problems for an individual but a study done by Meneghim MC et al (8) demonstrated that mild fluorosis levels are acceptable and hardly perceptible.

About 229 (74.3%) subjects prevented themselves from attending at the social gatherings and Maximum were those who had a TSIF score of 4. This is in line with a study conducted by Marshman et al (16) in which the subjects were teased, called names and often being asked questions by others they were meeting for the first time.

268 (87.3%) showed their willingness to get the treatment done for the appearance of their teeth. Willingness was greatest in the subjects with the TSIF score of 4 followed by score 5. All children and 56% of the adults wanted treatment in a study conducted by Van Palenstein Helderman WH and Mkasabuni E (14). 238 (77.3%) subjects were aware about the availability of the treatment procedures but only 114 (37%) subjects consulted the dentist regarding the appearance of their teeth, again the maximum subjects were those who had the TSIF score of 4. This shows that small percentage of the subjects consulted the dentist irrespective of the scores this can be because of lack of dental services, accessibility, and affordability or may be because of their poor attitude towards the dental procedures. In the present study, it was observed that the TSIF score of 4, which is staining of the teeth, was greatest among the subjects, the main cause of concern to subjects for the need for aesthetic treatment. Similar results were observed by Clark DC et al (12) and Bhagyajothi CR (13).

The results of the present study showed that only 10% subjects were aware of the term dental fluorosis. Feelings of distress, embarrassment, worry and

hindered smiling due to dental fluorosis were expressed by children. The study showed that dental fluorosis had severe impact on the 12 to 15 years old school children especially on the subjects with TSIF score of 4 because of the staining. The proportion of the subjects perceiving mild levels as aesthetically unacceptable is also appreciable. Despite the severe impact of dental fluorosis on subjects, awareness about the availability of the treatment procedures, only small percentage consulted the dentist regarding the appearance of their teeth. This shows the negative attitude of subjects towards their oral health. More studies should be undertaken to look at the children's and general population's esthetic perceptions regarding dental fluorosis so that national and regional defluoridation programmes can be formed.

Multisectoral approach should be adopted including dental health professionals, governing bodies, social workers, health workers.

- ● To identify the population affected by the varying levels of fluorosis and help to provide prompt treatment for improving the patient's quality of life.
- ● To identify the areas with high fluoride content in water.
- ● Organizing health education programmes in the villages on the prevention of dental fluorosis.
- ● National oral health policies should be formed to provide subsidies on the water purification systems to the villagers.
- ● Social workers and village health guides can be trained to teach water purification methods to villagers.

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