

EVALUATION OF YOUNG'S KNOWLEDGE AND BEHAVIOR ABOUT DENTAL FLUOROSIS

ABSTRACT

AIM: This study has evaluated the knowledge about dental fluorosis and the behavior of young people regarding to the use of Fluor. **MATERIAL AND METHODS:** 313 students from High School of Tabatinga/SP, from 15 to 21 years old have answered a questionnaire with pre-encoded questions in which was approached the variables: gender, age, schooling level, dwelling, water consumption, oral hygiene habits, frequency of consults to the dentist and perception about clinical characteristics of fluorosis. Data obtained were analyzed by means of descriptive statistics. **RESULTS:** There was female prevalence (56.0%). Most of respondents (81.0%) answered brushing the teeth 3 times or more a day. About dentifrice use and quantity on the toothbrush, from 97% who has asserted using them, 58% cover all the bristles; 88% of participants know Fluor; however, regarding to its function or effect on the teeth, 17% and 32%, respectively, have not known how to answer. About water consumption, most of them consume from 1 to 2 liters a day, and the main source is the "faucet" (47%). It was observed that 49% of interviewees have visited the surgeon dentist less than one month ago; 93% have answered that the topic application of Fluor was carried out during the dentist consultation, and 32% have asserted that the application was performed in all the visits. Regarding the surface stains on tooth enamel, 59% have reported that they did not notice them; however, 21% have noticed white stains on the enamel. Regarding to the use of tooth paste in the childhood, 52% have reported that they used to ingest it. **CONCLUSION:** Young's knowledge about function and effect of Fluor on dental structures were mistaken, once the concept of dental cleaning was prevalent about prevention of caries, and the behavior about fluoridated toothpaste was inappropriate because they use it excessively, and they also asserted its ingestion in the childhood.

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KEYWORDS

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INTRODUCTION

Within the increasing expansion context of Public Health Dentistry, which search to enlarge the promotion of population health, as well as improve the level of awareness about oral diseases, the fluoride has been used as preventive measure of caries due to its capacity of re-mineralize dental structures.^{1,2} Several products were developed with Fluor in their composition in order to provide easy access of means of prevention by population, without demanded high cost and motivation for consumption. Among these measures, fluoridation of water supplies can be mentioned. It has occurred in 1985 in several towns in Brazil and has provided indiscriminate and universal access by the users.³

Further on the fluoridation of drinking water sources, Fluor also can be added to salt, prescribed or applied topically as gels, glaze or solutions, and mainly can be found in fluoridated dentifrices.¹ The access to Fluor by means of water public supplies and fluoridated dentifrices is the bigger responsible by the decrease of caries in Brazil; it has taken benefits for individuals in all the ages and all social layers.³ However, several authors⁴⁻⁶ have verified that, insofar as a decrease in the prevalence and incidence of caries was observed, an increase of fluorosis was also noticed.

Fluorosis was defined by a calcification disorder occurred in enamel, with formation due to continued ingestion of small daily doses of Fluor.⁷ It can occur due to the common practice to associate methods of use Fluor allied to the possibility of children swallow this component during the stage of formation of teeth. Therefore, in order to perform its beneficial role, the use of Fluor must be rational, controlling the sources that each individual can access to avoid the ingestion of additional doses.⁸

Before the exposed, this work had as aim evaluate the knowledge about the etiology of dental fluorosis and the behavior regarding to the use of Fluor among young people in Tabatinga/SP.

MATERIAL AND METHODS

This study presented transversal lineation and the sample was composed by 313 young individuals from 15 to 21 years old, from both genders, public and private high school students in Tabatinga/SP, where the Fluor concentration in the water supplies is 0.80mg/l.

The instrument of evaluation used was a questionnaire previously validated with reproduction of data by means of a pilot study (Kappa test – values higher than 0.80), with pre-encoded questions applied by two calibrated researchers. The variables studied regarded to gender, age, schooling level,

dwelling, water consumption, oral hygiene habits, frequency of consults to the dentist and perception about clinical characteristics of fluorosis.

Indicators collected were inserted to an Excel™ 2010 spread sheet to perform descriptive analysis. In order to describe the sample, graphs with absolute and relative frequencies were used.

RESULTS

Among social and demographic characteristics of population studied, it is highlighted most prevalence of female gender participation (56.0%) on male (44.0%); about adolescents age, 98.0% was from 15 to 17 years old, and the medium age of participants was 15.5 years. Regarding to the schooling level, 54.0% were enrolled in the first year of High School and only 12.0% were in the third year. Regarding to the origin town, it was observed that 96.0% of adolescents were from Tabatinga/SP and 4% from other towns of the region.

About the oral hygiene habits, the results obtained from the answers provided by the participants after the application of the questionnaire can be observed in the Table 1.

Regarding to the daily frequency of tooth brushing, it was noticed that most of them (81.0%) have answered brushing their teeth 3 times or more, followed by the answer "twice a day" (18.0%). Concerning the

dentifrice, 97% of those who has answered use it, when asked about the quantity on the brush, 58% cover all the bristles with tooth paste and 33% use a volume similar to the size of a "kidney bean".

For questions about the use of tooth paste during the childhood, 48% have said remember the brand used in tooth brushing, and 52% of participants in the research have reported that they have ingested tooth paste when they were children.

Related to the habit to use mouthwash, the findings can be seen in the Table 2.

It was observed that 81% of the adolescents have said using mouthwash; 43% use to do it daily, 16% use to gargle it twice a week, 9% only once a week and 7% have reported gargle antimicrobial solution with intervals higher than 7 days. Regarding to the quantity of solution used in each gargle, it was verified that 43% use half dispenser lid (approximately 20ml) as reference, while 34% use one dispenser lip.

The Table 3 shows the distribution of answers obtained for questions related to the knowledge about the Fluor used in the dentistry products composition.

This study shows that several participants have answered know the Fluor (88%); however, when questioned about its function or effect on the teeth, a relevant percentage of adolescents did know how to answer (17% and 32%, respectively). Many of

them have said that the function of Fluor would be cleaning the teeth (32%), others that the Fluor should “prevent caries” (23%) or strengthen the tooth enamel (3%). For the question about the effect of Fluor on the teeth,

the same last percentages were observed for the answers “protect teeth” and “cleaning the teeth”.

Table 1. Distribution of absolute (n) and relative (%) frequency of participants, according to their answers about oral hygiene habits.

Questions/Answers	Frequency	
What is the daily tooth brushing frequency?	N	%
Do not answer	0	0.0
Once a day	2	1.0
Twice a day	56	18.0
three times or more a day	255	81.0
Do not tooth brushing	0	0.0
Do you use tooth paste?		
No	10	3.0
Yes	303	97.0
What quantity of tooth paste do you put on the toothbrush when you brush your teeth?		
Did not answer	18	6.0
Rice grain	11	3.0
Kidney bean	103	33.0
Fill all the bristles	181	58.0
Do you remember what tooth paste you used when you were a child?		
Did not answer	69	22.0
No	94	30.0
Yes	150	48.0
Did you use to ingest the tooth paste?		
No	149	48.0
Yes	164	52.0
TOTAL PARTICIPANTS	313	100.0

Table 2. Distribution of absolute (n) and relative (%) frequency of participants, according to the answers about mouthwash.

Questions/Answers	Frequency	
Do you swallow using fluoridated mouthwash?	n	%
No	60	19.0
Yes	263	81.0
What is the swallow frequency?		
Did not answer	61	19.0
Less than once a week	23	7.0
Once a week	28	9.0
Twice a week	50	16.0
Daily	134	43.0
More than once a day	17	5.0
What is the mouthwash quantity used in the swallow?		
Did not answer	73	23.0
Half metering lid (± 20 ml)	135	43.0
one metering lid (± 40 ml)	105	34.0
TOTAL PARTICIPANTS	313	100.0

Table 3. Distribution of absolute (n) and relative (%) frequency of participants, according to their answers about Fluor knowledge.

Questions/Answers	Frequency	
	n	%
Do you know the concept of Fluor?		
No	36	12.0
Yes	277	88.0
What is the function of Fluor?		
Did not answer	54	17.0
prevention of caries	72	23.0
Dental enamel strengthen	10	3.0
Teeth cleaning	100	32.0
Other	77	25.0
What is the effect of Fluor on the teeth?		
Did not answer	100	32.0
Prevent caries	81	26.0
Teeth cleaning	81	26.0
Teeth strengthen (enamel)	25	8.0
Teeth cleaning and strengthen	14	4.0
Teeth cleaning, strengthen and protect	2	1
Other	10	3.0
TOTAL PARTICIPANTS	313	100.0

Regarding to the fluoridated water consumption, the results are presented in the Table 4.

It was noticed that most of the participants consume from 1 to 2 liters of water a day, and the main source is “the faucet”, followed by the water filter (35%) and in smaller percentage, mineral water bottled in gallon (14%).

The behavior before the dentistry consults is presented in the Table 5.

Regarding to the results obtained about behavior before dentistry consults, it is observed in the Table 5 that 49% of interviewees reported visiting the surgeon dentist less than 1 month ago, and 26% reported 3 months. Only 9% reported that the time from the last visit was higher than 1 year.

About the fact to be undergone the application of Fluor during the dentistry

consults, almost all the students reported affirmatively (93%). An important result observed was that 32% reported which application of Fluor was performed in all the consults. When questioned about the perception of white stains on enamel surface, 59% reported do not notice them; however, 21% reported there are white stains and 11% noticed defects on enamel.

DISCUSSION

Discovery of anti-cariogenic properties in the Fluor constitutes an important boundary in Dentistry, and an effective auxiliary method in the control of caries. Due to the great emphasis about the massive use of preventive products, fluoride vehicles like dentifrices, mouthwashes, gels and varnishes for professional use among others were available

for population, without appropriate planning of their indications.

Table 4. Distribution of absolute (n) and relative (%) frequency of participants, according to the answers about water consumption.

Questions/Answers	Frequency	
	n	%
What is the water quantity consumed per day?		
Did not answer	12	4.0
0.5 liter	14	4.0
0,5 to 1,0 liter	67	21.0
1,0 to 2,0 liters	145	46.0
More than 2,0 liters	110	24.0
What is the water source used to consume?		
Did not answer	11	4.0
Faucet	148	47.0
Gallon	44	14.0
Filter	110	35.0
TOTAL PARTICIPANTS	313	100.0

Table 5. Distribution of absolute (n) and relative (%) frequency of participants, according to the answers about their behavior regarding to the dentistry consults.

Questions/Answers	Frequency	
	n	%
How long time remaining from the last visit to the dentist?		
Did not answer	5	2.0
Less than 1 month	153	49.0
Near to 3 months	82	26.0
Near to 6 months	46	15.0
One year or more	27	9.0
Have the dentist ever applied Fluor during any consult?		
No	23	7.0
Yes	290	93.0
Does the dentist apply Fluor in all the consults?		
No	213	68.0
Yes	100	32.0
Have you ever noticed stains on your teeth?		
Did not answer	7	2.0
White stains	65	21.0
Yellow or brown stains	22	7.0
Defects on enamel (whole, depressions)	34	11.0
Absence of stains	185	59.0
TOTAL PARTICIPANTS	313	100.0

The common practice to associate these methods to the Fluor, allied to the possibility of swallow this component by children during the stage of teeth formation becomes a potential risk for undesirable events, like fluorosis.¹⁰ According to Provenzano et al.² (2008), the use of Fluor must be linked to constant monitoring,

because inappropriate doses can provide acute and chronicle undesirable effects, like dental fluorosis.

It is know that almost all dentifrices, including those with more affordable prices, contain Fluor in their formulation, causing impact on the population, both in the incidence

of caries and in the appearing of fluorosis cases.⁶ Its prevalence is expressed mainly in the light and very light ways, both noticed in communities where there is no fluoride in the water.⁴

This study searched evaluating the knowledge of young individuals with mean age of 15.5 years about the rational use of products with Fluor, as well as its effects and consequences for dental structures when used indiscriminately. Similar studies can be found in the literature, but with different ages.^{1,10,11.} Those who have investigated the presence of fluorosis used Dean Index to classify the severity degree of the problem. Fujibayashi et al.¹ (2011) observed from 362 students evaluated with mean age of 9.92 years, 42.5% presented fluorosis in light degree and 32.5% in moderated degree. Provenzano et al.² (2008) studied children from 7 to 12 years old, and observed that 25.3% of them presented fluorosis in light or very light degrees. Brandão et al.¹² (2002) studied schooling ones from 5 to 15 years old, and verified 17.2% of prevalence of fluorosis. Another similar study was performed by Oliveira and Milbourne⁵ (2010) in which they evaluated children from 7 to 12 years old, and achieved as result that the light degree of fluorosis was most frequent (77%). It demonstrates the importance to observe the oral hygiene and feed habits that this population presents, once the patient's

education and motivation are strategic within the oral health promotion process.¹³

Regarding to the hygiene habits, tooth brushing has shown itself adequate because of the prevalence of patients who reported perform it 3 times or more a day. Lima and Cury¹⁴ (2001) observed that 90% of people researched brush their teeth twice or more times a day, while Moura et al.¹⁶ (2010) evaluated students in their 12 years old, and 30,3% have reported brushing their teeth twice a day, and 57.6% three times a day. However, an inadequate patient's habit was the exaggerated use of dentifrice during the brushing, because many of them reported fill all the bristles with tooth paste. Similar result was found in studies performed by Martins et al.¹⁶ (2002) and Provenzano et al. (2008).²

It is important detach that dentifrices are pastes with creamy or gel consistencies, composed by different chemical substances, in order to facility removal or disorganization of plaque and allow the administration of fluoride on the teeth surfaces. Magalhães et al.¹⁷ (2011) asserted that as bigger the quantity of dentifrice on the bristles, the higher probability to ingest the product. In this way, tooth brushing with fluoride dentifrice should be performed must and supervised by parents with children under six years old, as well as the attention that must be given to the quantity of dentifrice on the bristles that should be as less as possible, in order to avoid dental fluorosis.

Regarding to the use of fluoride dentifrice before 5 years old, it possible notice in the literature that, among the main sources associated to the increase of dental fluorosis prevalence, we can find, further fluoride water, industrialized children dentifrices and food consumed before the six years old.¹⁹ In this study, when questioned about the frequent ingestion of tooth paste in that period of life, 52% reported affirmatively. This fact intensify the hypothesis that parents or responsible by children, or even educators, are not informed about the risks of use fluoridated tooth paste in the early childhood, when children still have no satisfactory control on swallow, and they can unduly ingest the product and provoke a chronic intoxication by Fluor. It was previously reported when Provenzano et al.² (2008) observed in their research that the group which have obtained most distribution of fluorosis corresponded to children who started their use of dentifrice before three years old (22.1%).

As a control measure, parents should be better oriented about the adequate period to start their children's tooth brushing; in other words, as soon as they start the eruption (within the first and the second year of life), always supervised by an adult and using dentifrice without Fluor. In this sense, Magalhães et al.¹⁷ (2011) suggested as fundamental explaining parents about benefits and risks of fluorides, in order to minimize the

incorrect use of fluoride dentifrices by young children.¹⁶

Regarding to the use of fluoride mouthwash, students have reported use them twice a week (16%) or daily (43%), while some of them (5%) still have reported use it once a day. These results show the influence of the media in the indiscriminate use of mouthwash, once the information transmitted by propaganda is to use the product after tooth brushing, what make population understand that the use can be more frequent than it really should.

This work also investigated the knowledge about the effect and function of Fluor among young people studied. It was observed inadequate knowledge from the conceptual viewpoint, because many of them know that Fluor is used in order to prevent caries (23%) or protect teeth against this disease (26%). However, many of them believe that this element function in the products addressed to hygiene would be providing dental cleaning (32%). Only 8% answered that the effect of Fluor on dental structure would be the enamel strengthens.

Regarding to the water fluoridation, it can be considered an equitable public health measure, further to present a very favorable cost-benefit relation because its low cost, economy and scope.^{19,20} Sousa et al.²¹ (2010) observed that in the most developed countries, the prevalence of caries in schooling when they

are 12 years old have decreased in the last decades, as well as it is happening in several Brazilian regions. This fact can be related with water fluoridation in public supplies, prevention programs performed by schools and the scope of fluoride dentifrices in the country. Ferreira et al.²² (2010) evaluated the factors associated to the endemic dental fluorosis in countryside Brazilian communities, in which the water supplies sources were deep tubular wells. Dental fluorosis in severe degree was found in 80.4% of individuals.

It is possible consider that water supply, which can be consumed to drink or prepare food, should provide Fluor in adequate concentration to prevent caries, when considered the average consumption in each region, according to the environmental temperature, that is 0.7 ppm F (mg F/L) for most Brazilian regions, with minimum tolerance of 0.6 and maximum of 0.8.^{7,16,23}

In the case of water is fluoridated, it will have a systemic effect in the Fluor incorporation in the hydroxyapatite in enamel formation. Therefore, the period in which children are feed with milk powder formulations, in which water must be added, great care must be taken with the right concentration in the source used.^{6,19} However, according to Sari et al.⁷ (2004), isolated consumption of water artificially fluoridated is not able to generate high prevalence of fluorosis. Another factor evaluated was the

type of water source consumed. In this study was observed that 47% of young people interviewed reported the water source, 35% the filter, which also correspond to the fluoridated water from the public source and only 14% drink mineral water (gallon). Studies about this subject point to, in average, the mineral water consumption is from 27 to 30% of population,^{11,24} while most people consume water from the public sources.

Regarding to the dentistry consults, it was noticed that great part of sample seemed concerned with oral health, once the frequency of visit to the dentist was the last month (49%). Most of them (93%) mentioned topic application of Fluor by professional, and 32% of them reported that the dentist perform it in all the consults.

Regarding to the structural and aesthetic changes caused by fluorosis, the study searched whether students have noticed white or dark stains due to the Fluor excess on the enamel. From the students interviewed, 21% reported noticing white stains, 7%, yellow or brown stains on teeth, and 11% observed defects on enamel structure. According to Piovesan and Ardenghi²⁵ (2012), fluorosis in light degrees of severity seems do not affect the quality of life and the daily activities of Brazilian children and adolescents who notice clinical signals. As Silva et al.⁶ (2007) asserted that the fluorosis impact in health self-perception is small among Brazilian

adolescents, it is not considered public health problem. Parreiras et al.²⁶ (2009) also detached that fluorosis cannot be noticed as a public health problem because only most severe degrees conduce to structural mineral loss. Still in this context, Martins et al.¹⁶ (2002) corroborate with this hypothesis reinforcing the concept of schooling's non-perception of stains may be related to the great number of variables which interfere, like cultural matters, social economical level, and even the stains localizations, what may not affect its concept of fluorosis effect in smile.

Thereunto, it is possible infer by this research that other studies should be performed to investigate the way as children and adolescents behave themselves regarding to the use of Fluor in caries prevention. Besides, the parents, responsible and educator's approach should be emphasized in order to achieve better supervising in the use of fluoridated products to minimize the consequences of non-rational use of Fluor during teeth formation.

CONCLUSION

According with the methods used in this study, it is possible conclude that:

- The knowledge of young people studied about function and effects of Fluor on dental structures were mistaken, once the concept of tooth cleaning prevailed in relation to the caries prevention;

- The behavior about fluoride dentifrice was inappropriate, because its use was excessive and they reported ingesting it during the childhood.

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