

Original Article**Knowledge and attitude of the primary school male students about the Iranian fluoride mouth rinse**

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**Abstract**

**BACKGROUND:** This study was designed to assess the knowledge and attitude of male students of Kerman primary schools about 0.2% sodium fluoride mouthwash solution that students used it once a week.

**METHODS:** In this cross-sectional study, a total of 502 boys, eight to nine year-old and students of Kerman primary schools were selected for the study. The data related to their knowledge and attitude about the sodium fluoride mouthwash were collected by questionnaire.

**RESULTS:** The boy students' knowledge about the sodium fluoride mouthwash solution was good but their attitude was negative.

**CONCLUSIONS:** The oral health education program concerning the optimal use of the fluoride mouthwash in dental caries prevention is highly recommended. It is suggested that its taste is improved.

**KEY WORDS:** Knowledge, attitude, mouth rinse, fluoride.

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**A** proper knowledge and attitude in children and adolescents about oral hygiene and use of fluoride mouth rinses will finally lead to prevention of dental caries.<sup>1,2</sup> In Iran, the distribution of 0.2% sodium fluoride mouthwash solution in primary schools has been started since a few years ago and students have been advised to use it once a week. However, its written prescription has not distributed among the students and the manner of use and the efficacy of this measure has not been studied yet.<sup>3</sup> Correct and proper use of this sodium fluoride mouthwash is very important, and it seems necessary to distribute a page contains direction for use along with the mouthwash.

The concentration of fluoride in the microbial plaque of tooth surface varies continuously. Fluoride may be up taken either directly from fluoridated water, fluoride containing foods, tooth paste and other topical sources such as mouth wash solutions or brought indirectly by saliva from similar sources. Fluoride ion in plaque and saliva controls demineralization process and its presence in the surface between plaque-enamel is the key for its efficacy since it improves the mineralization process by phosphate and calcium ions.<sup>4</sup> Results of the in vitro studies indicated that the fluoride mouth rinses are capable of providing significantly better fluoridation of de-mineralized enamel, as well as significantly better protection against the initia-

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tion and progression of demineralization.<sup>5</sup> The aim of this study was to evaluate the knowledge and attitude of 502 school boys about 0.2% sodium fluoride mouthwash solution which the students used it once a week.

**Methods**

In this cross-sectional study, a total of 502 male students aged eight to nine year-old in Kerman primary schools, which used the sodium fluoride mouthwash, were selected by multistage stratified sampling procedure. The data related to their knowledge and attitude about the sodium fluoride mouthwash solution (Iran Daroo Co., Batch No. 232) were collected by a questionnaire which designed by researchers. Internal consistency, validity, reliability and test-retest reliability of the questionnaire was evaluated. Questionnaires were used for the similar studies among children.<sup>6,7</sup> The questionnaire contained three questions:

A- Do you know what instructions you should follow before and after using of fluoride mouth wash solution?

0 = Do not know.

1 = Usage of a snack before using of the mouth wash solution and irrigation after using it

2 = Rinsing by water before and after using of the mouth wash solution

3 = Rinsing by water before using of the mouth wash solution and brushing after using it

4 = Brushing before using of the mouth wash solution and rinsing after using it

5 = Brushing before and after using of the

mouth wash solution

6 = Rinsing by water before using of the mouth wash solution and avoid from eating or drinking for half an hour after using of the mouth wash solution

7 = Brushing before using of the mouth wash solution and avoid from eating or drinking for half an hour after using of the mouth wash solution [true answer]

B- What is your opinion about the fluoride mechanism which prevents dental caries?

0 = No idea

1 = Strengthen tooth enamel

2 = Delete cariogenic microorganisms

3 = Strengthen tooth enamel and a bit delete cariogenic microorganisms [true answer]

C- Do you like the taste and flavor of fluoride mouth wash solution?

0 = No

1 = Yes

Data were analyzed by SPSS (v.16) software. Because the mentioned mouthwash was used weekly, there was not any ethical problem. At the end of study participants were given a package contained toothbrush, dental floss and toothpaste to thank their collaborations.

**Results**

The distribution of students according to their knowledge about mechanism of effect of 0.2% sodium fluoride mouthwash on the teeth and direction of use, in addition to their attitude about flavor and taste of the fluoride mouthwash are presented in tables 1-3.

Table 1. Knowledge about mechanism of effect of fluoride in primary school male students

Knowledge point *	Age	8-year-old		9-year-old		Total	
		n	%	n	%	n	%
0		24	9.8	21	8.2	45	9.0
1		6	2.5	0	0.0	6	1.2
2		75	30.6	93	36.2	168	33.5
3		140	57.1	143	55.6	283	56.4

\* Refer to text

Table 2. Knowledge about direction of use of the fluoride mouthwash solution in primary school male students

Knowledge point*	Age	8-year-old		9-year-old		Total	
		n	%	n	%	n	%
0		21	8.6	21	8.2	42	8.4
1		3	1.2	4	1.6	7	1.4
2		0	0.0	11	4.3	11	2.2
3		13	5.3	0	0.0	13	2.6
4		11	4.5	20	7.8	31	6.2
5		22	9.0	20	7.8	42	8.4
6		76	31.0	61	23.7	137	27.3
7		99	40.4	120	46.7	219	43.6

\* Refer to text

Table 3. Attitude about flavor and taste of the fluoride mouth wash solution in primary school male students

Attitude point*	Age	8-year-old		9-year-old		Total	
		n	%	n	%	n	%
0 (No)		214	87.3	221	86.0	435	86.7
1 (Yes)		31	12.7	36	14.0	67	13.3

\* Refer to text

## Discussion

Fluoride has an important protective role for controlling the demineralization process of enamel. It has been previously thought that the effectiveness of topically applied sodium fluoride is due to formation of a fluorohydroxyapatite; however, later studies showed that the primary reaction product involved is the transformation of surface hydroxyapatite to calcium fluoride. The apatite crystal is disintegrated into its components and following that, the reaction between fluoride and calcium ions leads to the production of calcium fluoride with a net loss of Phosphate ions. It has been proved that calcium fluoride deposit on enamel surface following topical use of fluoride prevents dental caries. The initial deposition of calcium fluoride on the treated tooth surfaces is not permanent; a relatively fast decrease of fluoride content occurs during the first 24 hours and a gradual decrease during the subsequent 15 days. In spite of this, the deposit leads to an increase in fluoride content on the outermost layers of the enamel.<sup>4,8</sup>

In current study, 56.4% of the students knew mechanism of effect of fluoride for prevention of caries. This percent was 76.3 among students in Tehran<sup>9</sup> and 67% for students in Belfast.<sup>10</sup> 43.6% of the students had true knowledge about direction of use of the fluoride mouth wash solution but only 13.3% of them liked the taste and flavor of fluoride mouth wash solution. In a study among Chinese children, more than 60% of students knew that fluoride toothpaste could prevent dental caries by strengthening the out layer of tooth surface.<sup>11</sup> But a study in Saudi showed 44.6% of school children actually had heard about fluoride and 34.6% correctly identified the action of fluoride as preventing tooth decay.<sup>12</sup> We did not find any similar study about this fluoride mouth wash solution in literature.

Researchers believe that fluoride enters into the plaque directly by topical use, and indirectly by systemic absorption.<sup>4,13</sup> The results of a study about sodium fluoride mouth wash solution showed after the using of sodium fluoride mouthwash, fluoride concentration showed a significant increase in both the plaque and saliva. Phosphate concentration decreased in

both plaque and saliva, but its decrease was significant only in plaque. Calcium concentration in both saliva and plaque decreased after using the mouthwash, but in none of them the decrease was significant.<sup>14</sup>

In conclusion, the male students' knowledge about the sodium fluoride mouthwash solution was good because 56.4% and 43.6% of them chose true answers. However, attitude of more than 85% of them about the taste of

mouthwash was negative, therefore it is necessary to be improved. The oral health education program concerning the optimal use of fluoride in dental caries prevention is highly recommended and oral health promotion should be designed to be a continuous process rather than a short-term intervention.

### Conflict of Interest

Authors have no Conflict of Interest.

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