

Effective Factors on the Adoption of Oral and Dental Health Behaviors among Primary School Students: A cross-sectional study in Dehloran

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Article Info	ABSTRACT
Article type: Original article	Introduction: One of the key points for keeping children's health is to promote oral and dental health. Considering the prevalence of oral and dental diseases in children, this study aimed to determine the rate of adoption of oral and dental health behaviors and some of its effective factors in students.
Article History: Received: April. 11, 2026 Revised: May. 13, 2026 Accepted: June. 15, 2026 Published Online: June. 27, 2026	Materials & Methods: In this descriptive-analytical study, 350 students from the fourth and fifth-grade elementary schools of Dehloran were selected by cluster sampling. The data instruments were a demographic and background questionnaire and a researcher-made questionnaire for assessing the knowledge, attitude, and adoption of oral and dental health behaviors which were completed by the students. The data were analyzed using SPSS software version 20, descriptive statistics, and a Logistic regression test.
 Correspondence to: Rahman Panahi Health Metrics Research Center, Iranian Institute for Health Sciences Research, ACECR, Tehran, Iran	Results: The results showed that all three variables of knowledge, attitude, and adoption of oral and dental health behaviors were at a moderate level in the students. Adoption of oral health behavior was poor in 28% (98 students), and moderate in 72% (252 students). There was a significant relationship between the adoption of oral and dental health behaviors and gender, the level of mother's education, and the knowledge and attitude of the students ($P < 0.05$).
Email: Peimanpanahi63@yahoo.com	Conclusion: In designing educational programs to improve the adoption of oral and dental health behaviors among students, in addition to paying attention to their knowledge and attitude, we should pay special attention to gender and the students' mothers with a low level of education.
	Keywords: Students, Behavior, Knowledge, Attitude, Oral and Dental Health

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Introduction

Achieving health depends on considering and planning all components that affect it [1]. Since the general health of the body depends on oral health, its health affects the health of the whole body [2], the study of oral health is one of the criteria for measuring the health of people in the community [2,3]. Oral health refers to all aspects of oral health and function, especially gums and teeth [4], and it is one of the eleven important slogans of the 21st century and is also a component of PHC [1]. The World Health Organization (WHO) also considers oral health as a necessity and as an important part of public health throughout life and they have also stated that poor oral health could have a significant impact on the quality of life. In addition, studies showed that lack of oral hygiene affected nutrition, speech, and voice quality [5] and it is the cause of oral diseases, but various factors are involved in the prevalence and severity of these diseases in various population groups. The most important of these factors are age, gender, lifestyle changes, and habits related to nutrition and social and cultural variables [6]. The impact of these diseases on individuals and society through causing suffering, dysfunction, and reduced quality of life is significant [7].

Oral diseases are one of the most important public health issues [8]. Tooth decay is the most prevalent and common disease and more than 99% of people are infected with this disease and there are only a very limited number of people who do not suffer from it during their lifetime [9]. Tooth decay also has economic, social, and psychological dimensions [8]. The most sensitive and vulnerable group to tooth decay is children [1]. Despite the improvement of oral health status in children and adolescents, tooth decay is still one of the most common diseases in human societies [10]; In the study by Panahi et al. [11], 75.2% of children, and in the study of Mohebbi et al. [1] and Gorgi et al. [12], 91.7% and 48.5% of adolescents had tooth decay, respectively. According to the World Health Organization, 60 to 90% of students in the world suffer from tooth decay, and the

highest rate was reported among students in Asian and Latin American countries [13].

The health practices and behaviors of the people of any society are affected by their level of knowledge, awareness, and attitude. Therefore, to achieve the goals of prevention programs, it is necessary to raise awareness and improve people's attitudes about the prevention of oral diseases [9]. Children are receptive to learning at school and the health habits formed in school have a long-term effect on individuals [14]. On the other hand, the health of society depends on having healthy children, and one of the basic points to promote the health of children is to care about their oral health [9]. Therefore, schools can play an effective role in raising the level of awareness and attitude in students and provide a suitable environment for them to learn behaviors that prevent oral diseases and to make health decisions [8,15]. Many studies were conducted in the country regarding the knowledge, attitudes, and behaviors related to oral health among students. In the study by Shokoohi Nia et al., The knowledge, attitude, and behavior of students about brushing were generally at a good level [8]. Also, students' knowledge, attitude and health practice about oral health in the study of Mirzaei Alavijeh et al. were moderate [9].

The World Health Organization suggests that every country should regularly study their peoples' oral health every five- years. Also, due to the young population of the country, it is necessary to plan for the prevention and treatment of oral diseases. The first step is to prepare a comprehensive report on oral health indicators [17]. Therefore, considering that a comprehensive study on oral health behaviors among children in Dehloran has not been conducted so far, this study aimed to determine the rate of adoption of oral health behaviors and some of the factors affecting it among students in this city.

Materials and methods

This study was a descriptive-analytical cross-sectional study and the population consisted of fourth and fifth-grade elementary students in Dehloran.

Sampling was done by random cluster sampling method was used in which Dehloran was first divided into two regions of north and south. Then, two schools were randomly selected (one school from the north and one school from the south) and all the students in the fourth and fifth grades of the two schools (6 classes in total) met the criteria to participate in the study.

In the present study, the sample size was 350 people which was determined by Cochran's sample size formula, considering $P\text{-value} = 0.65$ for the average frequency of performance among the students [9], an error level of 5%, and accuracy of 0.05. The sample was considered to be 365 considering a 5% probability of sample fall. Inclusion criteria included the willingness of individuals to enter the study, being in the fourth or fifth grade of primary schools, filling out the consent form by parents, and completing the questionnaire. Incomplete questionnaires were considered as an exclusion criterion.

A researcher-made questionnaire (34 questions) was used for collecting the data. It consisted of 4 sections of personal information (including 9 items), a knowledge section (including 10 items in which the correct answers received one score and the wrong ones received zero), the section of attitude (Including 10 items with a 5-point Likert scale that gave the best answer 5 and the worst one zero), and the behavior section (including 10 items with a score of 0 to 4 depending on the performance of individuals). The initial questionnaire was designed according to the objectives of the research based on valid scientific sources. The content validity of the questionnaire was assessed by a panel of health and dental education specialists, and their comments were applied to the final draft of the questionnaire. Cronbach's alpha method was used to determine the reliability of the instrument. The score obtained for Cronbach's alpha coefficient for the variables of knowledge, attitude, and behavior was calculated to be 0.79, 0.73, and 0.75, respectively.

For leveling knowledge, attitude, and behavior, obtaining less than 33.3% of the whole score was considered as low, 33.66-3.6% as average, and 66.7% -100% as good ranks [9].

The research project number was received from the Ilam University of Medical Sciences (No. 28/935002), and the necessary coordination was done with the Dehloran Education Department and the selected school principals. The purpose of the study was also explained to the students and their parents' written consent was obtained. Also, they were entered into the study voluntarily and they were informed that all data would be confidential. The questionnaires were completed by trained oral hygienists through interviews. Then, the data were analyzed by SPSS software version 20, using descriptive statistics and logistic regression. For the behavior variable, the middle category was extracted as the "desirable behavior" category, and the weak category was considered as the "undesirable" category and this was used in the logistic regression. The variables were entered simultaneously by the method of contrast of independent variables classified as indicators, and the first category of variables was selected as a reference category. The adoption of oral health behaviors was a dependent variable and age, gender, educational background, parents' occupation, parents' education, number of family members, family birth rank, knowledge and attitude were independent variables. In addition, the level of significance was less than 0.05.

Results

365 students entered the study and 15 were excluded due to incomplete questionnaires (95.9% participated). Therefore, 350 questionnaires were used in the final analysis. Of these, the highest number of students was in the age group of 11 years with 43.4% (152 people), and the male gender with 52% (182 people). 70.9% (248) of the students reported that their mother's job was as a housewife, and only 8% (28) reported that their father was

unemployed. Table 1 showed the other demographic characteristics of the participants.

Table 1. Frequency distribution of students studied according to demographic and contextual characteristics

Variable	Category	Number	Percent
Age	9	28	8
	10	136	38.9
	11	152	43.4
	12	34	9.7
Sex/gender	Girl	168	48
	Boy	182	52
School Grade	Fourth- grade	162	46.3
	Fifth-grade	188	53.7
Birth Rank in Family	First	162	46.3
	Second	78	22.3
	Third	60	17.1
	Forth and more	50	14.3
Number in Family	Two or three	16	4.6
	Four	140	40
	Five	112	32
	Six and more	82	23.4
Mothers' Job	Housewife	248	70.9
	Clerk	22	6.3
	Teacher	58	16.6
	Businessman	22	6.3
Fathers' Job	Teacher	40	11.4
	Clerk	118	33.7
	Worker	50	14.3
	Businessman	114	32.6
	unemployed	28	8
Mothers' level of Education	Illiterate	56	16
	Junior high school	108	30.9
	Diploma	86	24.6
	Associate Degree	40	11.4
	Bachelor's degree and higher	60	17.1
Fathers' level of Education	Illiterate	36	10.3
	Junior high school	76	21.7
	Diploma	90	25.7
	Associate Degree	54	15.4
	Bachelor's degree and higher	94	26.9

The results showed that the Mean /Standard deviation scores of knowledge, attitude, and adoption of oral health behaviors among the students were 3.60 (1.37), 28.16 (5.7), and 15.03(2.98) respectively. In other words, all three variables of knowledge, attitude, and behavior were at a moderate level. In awareness, 42.3% (148 people) had poor knowledge,

56% (196 people) had moderate knowledge and 1.7% (6 people) had good knowledge. In attitude, 59.4% (208 people) had a moderate attitude and 40.6% (142 people) had a good attitude. Behavior adoption was also poor in 28% (98 people) and moderate in 72% (252 people).

Table 2 showed the factors affecting the adoption of oral health behaviors in the students. There was a statistically significant relationship between the adoption of oral health behaviors and the gender of students ($P = 0.020$) so the chances of adopting oral health behaviors at the desired level of knowledge for male students were 0.352 times more likely than for female ones.

There was also a statistically significant relationship between the adoption of oral health behaviors and the level of education of the students' mothers ($P = 0.040$) so that the chances of adopting oral health behaviors at the desired level in students with mothers with secondary education, Diploma, post-diploma and bachelor's degrees and above were 4.849, 6.201, 7.037 and 2516.5 times more than the students with illiterate mothers, respectively.

Table 2. Factors affecting the adoption of oral health behaviors in the students in logistic regression test *.

Variable		Chance Rate	Confidence interval		P-Value
			High limit	Low limit	
Sex/Gender	Girl	Reference			
	Boy	0.352	0.846	0.146	0.020
Age					0.415
	9	Reference			
	10	2.806	12.582	0.626	0.178
	11	1.836	11.292	0.299	0.512
	12	1.095	8.886	0.135	0.932
School Grade	Fourth	Reference			
	Fifth	2.136	6.757	0.675	0.197
Fathers' Job					0.453
	Teacher	Reference			
	Clerk	0.846	3.417	0.209	0.814
	Worker	1.689	10.685	0.267	0.578
	Businessman	1.730	8.579	0.349	0.502
	unemployed	0.483	3.610	0.065	0.478
Fathers' level of Education					0.072
	Illiterate	Reference			
	Junior high school	0.193	0.820	0.045	0.126
	Diploma	0.338	1.601	0.071	0.172
	Associate Degree	0.396	2.683	0.058	0.342
	Bachelor's degree and higher	0.064	0.523	0.008	0.110
Mothers' level of Education					0.040
	Illiterate	Reference			
	Junior high school	4.849	24.880	0.945	0.048
	Diploma	6.201	29.472	1.305	0.022
	Associate Degree	7.037	42.226	1.173	0.033
	Bachelor's degree and higher	25.516	191.087	3.407	0.002
Mothers' Job					0.836
	Housewife	Reference			
	Clerk	0.763	4.060	0.143	0.751
	Teacher	0.566	1.950	0.165	0.367
	Businessman	0.749	3.969	0.141	0.734
Number in Family					0.918
	Two or three	Reference			

	Four	0.493	3.575	0.068	0.484
	Five	0.529	4.497	0.062	0.560
	Six and more	0.496	4.729	0.052	0.542
Birth order in the family	Birth Rank in Family				0.721
	First	Reference			
	Second	1.025	3.056	0.344	0.964
	Third	0.550	1.863	0.162	0.337
	Forth and more	0.569	2.368	0.137	0.438
Awareness					0.029
	Poor	Reference			
	Moderate	1.071	2.009	0.378	0.047
	Good	1.161	1.350	0.003	0.037
Attitude	Moderate	Reference			
	Good	2.717	6.449	1.145	0.023
Fixed Value		1.738			0.752

*Independent variables were entered into the logistic regression model simultaneously.

Moreover, there was a statistically significant relationship between the adoption of oral health behaviors and students' level of knowledge ($P = 0.029$), so the chances of adopting oral health behaviors at the desired level in students with moderate and good knowledge, were 1.071 and 1.161 times more than the students with poor awareness. Also, there was a statistically significant relationship between the adoption of oral health behaviors and the level of attitude of the students ($P = 0.023$), so the chance of adopting oral health behaviors at the desired level in students with good attitude was 2.717 times more than the students with moderate attitudes. Finally, there was no relationship between the adoption of oral health behaviors and other demographic and contextual variables ($P < 0.05$)

Discussion

This study aimed to determine the rate of adoption of oral health behaviors and some of the factors affecting it in the fourth and fifth-grade elementary students in Dehloran.

The results showed that the knowledge of the students about oral health is moderate. These results were consistent with the results of Mirzaei Alavijeh et al. [9], Goodarzi et al. [18], and Mohammadkhah et al. [19], but it was not consistent with the results of Shokohi Nia et al. [8] and Mehta and Koor [20] in which the students had good and poor awareness.

One of the possible reasons for this discrepancy was the difference between these studies and the present study in the age and educational level of the participants. Also, considering the lower age and literacy level of the students in the present study, their average level of knowledge about oral health was justifiable.

The results also showed that the attitude level of the students about oral health was moderate. This was consistent with the results of the study of Mohammadkhah et al. [19] but was inconsistent with the results of Khodakarami et al. [21], Shokouhinia et al. [8] and Mirzaei Alavijeh et al. [9] in which the students' attitudes were at a good level. Also, the students' knowledge was at a low level in Mehta and Keor study [20]. Possible reasons for this discrepancy included the smaller number of samples, different tools for measuring attitudes, and different social and cultural backgrounds in the present study compared to those studies. One of the possible reasons for the moderate level of attitude of the s students here is their average level of knowledge about oral health.

Moreover, the results showed that the adoption of oral health behaviors in the students was moderate. These results were consistent with the results of Goodarzi et al. [18], Mirzaei Alavijeh et al. [9], and Mohammadkhah et al. [19], but it was inconsistent with the results of Shokohi Nia et al. [8] and Mehta

and Koor [20] in which the behavior was at good and poor levels, respectively. One of the possible reasons for this discrepancy was the difference between the present study and these studies in the age and educational level of the participants. In addition, one of the possible reasons for the average level of behavior here was their average level of knowledge and attitude about oral health, and the significant and direct relationship among these three variables [23,22].

The results also showed that there was a statistically significant relationship between the adoption of oral health behaviors and the level of education of the students' mothers. These results were consistent with the results of Kumar et al. [24], Rabiee et al. [25], Amini et al. [26], and Mazlumi Mahmoud Abad et al. [27] in which education was one of the most important socio-economic indicators that affected the knowledge, attitude, and skills necessary to adopt health-related behaviors [28], and to increase in awareness, attitude and behaviors of mothers about oral health, and these changes also occurred in the students because of the close relationship between mothers and their children. It seemed that people with higher education had more access to the resources to acquire knowledge and information, and therefore the level of education of mothers, which were a model for adopting health behaviors among their children, could improve the performance of children, and it had an impact on their oral health.

Moreover, the results showed that there was a statistically significant relationship between the adoption of oral health behaviors and the students' gender. This was consistent with the findings of Shokoohi Nia et al. [8], Chand and Hadiat [29], and Sharda and Shetty [30]. This could be justified considering the role of gender in oral health and also the difference in the oral health behavior of girls and boys [8]. In other words, gender was one of the factors affecting oral health behavior, and more attention should be paid to boys in designing educational programs.

The results also showed that there was a statistically significant relationship between the adoption of oral health behaviors and the level of knowledge and attitude of the students. This was consistent with the results of Yavari et al. [31] and Kamran et al. [32]. Given that numerous sources and studies confirmed the impact of knowledge and attitude on behavior [23,22], these findings could be justified. Another finding was the greater impact of attitude on behavior compared to awareness which was valuable [33]. Therefore, it seemed that educational interventions could increase the adoption of oral health behaviors in students by increasing their awareness and attitude.

This study was conducted among fourth and fifth-grade students in Dehloran, so the results cannot be generalized to all children in other parts of the country. Therefore, it is recommended repeat this study on a larger scale in the country and especially among rural students. The small number of students, insufficient cooperation of some students, and the self-report method in filling out the questionnaires were limitations of the present study.

Conclusion

In general, the results showed a moderate level of knowledge, attitude, and adoption of oral health behaviors and the effect of gender, mother's education level, and knowledge and attitude on the adoption of oral health behaviors in the students. Therefore, in designing educational programs to promote the adoption of oral health behaviors for students, we should pay more attention to male students and mothers with lower levels of education in addition to their level of knowledge and attitude.

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Conflict of interest

There was no conflict of interest for the authors.

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