Original Article

Predicting oral health behaviors among Iranian students by using health belief model

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Abstract:

INTRODUCTION: The aim of this study is assessing predictors to oral health behavior in Iranian students based on the health belief model.

MATERIALS AND METHODS: This cross-sectional study was conducted on 416 (applying the statistical estimation) of fifth-grade female students of Tehran in 2016. Random cluster sampling method was used to recruit students. The inclusion criteria were being grade five female student (aged 10–12 years), and studying in governmental schools, and having a signed consent from the child's parent or legal guardian. Logistic regression analysis was used to identify the variables that predict oral health behaviors.

RESULTS: Overall, 416 female students were entered into the study. Of these, only 55.3% of the students reported that they were brushing at least twice a day, 22.4% were using dental floss at least once a day, and 23.1% reported checking their teeth every 6 months. The results obtained from the logistic regression analysis indicated that perceived self-efficacy, was the significant predicting factor for brushing at least twice a day (odds ratio [OR] = 1.34, 95% confidence interval [CI] =1.06–1.69, P = 0.012) and use of dental floss at least once a day (OR = 1.61, 95% CI = 1.14–2.27, P = 0.007). Furthermore, mother's job predicted use of dental floss at least once a day by (OR = 1.83, 95% CI 1.07–3.10). Perceived benefits were the significant predicting factor for 6 months check (OR = 1.78, 95% CI = 1.14–2.77).

CONCLUSION: The current study provides evidence oral health can be promoted by increasing perceived self-efficacy and enhancing perceived benefits in female students.

Keywords:
Health belief model, oral health, students

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Introduction

The public health problems associated with oral diseases are a serious burden on countries around the globe.[1] Despite great achievements in the oral health of populations globally, there still remain problems in many communities worldwide, particularly among underprivileged groups in both the developed and developing countries.[2] Oral health is part of the public health and essential to improve the quality of life. The World Health Organization projects intend to translate the evidence into action programs. The oral health program, therefore, gives priority to integration of oral health with general health programs at community or national levels.[1] Mechanical methods such as brushing and flossing are the easiest ways to reduce the incidence of plaque.[3] Less than twice daily tooth brushing has been one of the important identified key behaviors explaining the presence of dental caries in children.[4] Regular (daily) dental flossing is recommended for preventing oral diseases, but adherence is unsatisfactory.[5] The American Dental Association recommends cleaning between your teeth once a day.[6] Although brushing the teeth is a way to help

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clean the gums and teeth, the bristles of a toothbrush cannot reach all the bacteria in the mouth during this process. In addition to brushing the teeth, the South Asian Dental Association recommends the use of floss (or interdental cleaner) once a day to clean between the teeth and gum line.[7] Worldwide, 60%–90% of school children and nearly 100% of adults have dental cavities.[8] According to the Iranian Ministry of Health, most Iranian students do not pay adequate attention to their oral health, such that 76.9% of them reported that they were brushing less than twice a day.[9] The highest age at risk for oral diseases is in the age range of about 12–14 years.[10] There is still oral health problems in this target group.[11] This age is especially important as it is the age at which children, generally, leave the primary school.[12] Therefore, in many countries, it is the last age at which a reliable sample may be obtained easily through the school system.[13] Many researchers have shown that perceived oral health beliefs and attitudes influence oral health-related behaviors.[14-16]

A number of studies have shown that demographic characteristics such as education and job of parents and family income effect oral health behaviors.[17-21] Oral and dental diseases are closely related to lifestyle, for example, low sugar intake, regular brushing, and regular dental check-ups diagnosing oral diseases may help to improve the general health.[22,23] Educational intervention programs require understanding attitudes, beliefs, and behaviors related to oral health.[24] Therefore, in order to help understand oral health, behaviors should be based on an understanding of children's perceived beliefs.[25] Regarding the complex nature of the relationship among the attitudes, beliefs, and health behaviors,[26] the health education and promotion models have been used to explain the point.[24] Health Belief Model (HBM) is a belief-based theory of health-related behaviors that is used to predict and provide suitable dental health interventions.[25] It is one of the first theories developed exclusively for health-related behaviors. HBM relates psychological theories of decision-making (aiming to explain action in a choice situation) to an individual's decision about alternative health behaviors.[27] Since the 1950s, HBM has been one of the most widely used conceptual frameworks in health behavior research, both to explain change of health-related behaviors and as a guiding framework for interventions. Over the decades, it has been expanded, compared, and contrasted to other frameworks and used in health behavior change interventions. It is not possible to summarize all the applications of the HBM since the 1950s because so many practitioners and researchers have used it. However, the applications can be divided into three general categories: (1) behavioral research model building and instrument development, (2) primary prevention through health education regarding prevention of diseases or for specific protection against diseases, such as immunization, and (3) screening for diseases, compliance with treatment, and other secondary prevention tasks.[27] The model assumes that various factors, such as the perceived severity of a health problem, perceived benefits, and perceived barriers preventing individuals undertaking preventive actions, affect health-related beliefs and behaviors.[28] The HBM has been used to study a variety of long- and short-term health behaviors, including weight-control behavior,[29] hearing health behaviors,[30] and self-care behaviors.[31] Definitions of HBM constructs are summarized in Table 1.[32]

Table 1: Key health belief model components, conceptual definitions, and intervention strategies

Concepts	Concept definition	Intervention strategy to influence concept
Perceived susceptibility	Beliefs about the likelihood of getting a disease or condition	Defining population(s) at risk and risk, and levels
		Personalize risk based on person's individual characteristics or behaviors
		Making an individual's perceptions more consistent with his or her actual risk
Perceived severity	Beliefs about the seriousness of contracting a disease or condition , including consequences	Specifying consequences of risks and conditions
		Triggering emotions like distress and regret with images
Perceived benefits	Beliefs about the positive aspects of adopting a health behavior (e.g., efficacy of the behavior for reducing risk or serious consequences)	Shifting individual's perspective by highlighting others' beliefs about the behavior and its effects
		Providing knowledge and arguments in favor of the behavior
Perceived barriers	Beliefs about obstacles to performing a behavior, and the negative aspects (both tangible and psychological costs) of adopting a health behavior	Identifying and reducing perceived barriers through reassurance, correction of misinformation, incentives, and, assistance
Cues to action	Internal or external factors that could trigger the health behavior	Promoting awareness
		Using appropriate reminder and recall systems
Self-efficacy	Beliefs that one can perform the recommended health behavior (confidence)	Providing training and guidance in performing the recommended action
		Using progressive goal setting
		Giving verbal reinforcement.
		Demonstrating or model desired behavior
		Reducing anxiety about taking action

The main aim of this study was finding out which constructs of HBM could predict tooth-brushing frequency, use of dental floss and 6 months check of oral health in female students in Tehran, Iran.

Materials and Methods

Study design and participants

The study was cross-sectional, which was conducted on the grade five female students (10–12 years old) of governmental schools in Tehran (Capital of Iran) in December 2016 for 2 months. To obtain samples from among the 41,110 female students (grade five) studying in this city, a two-stage random cluster sampling method was used. In the first stage, from 20 education regions in Tehran, 10 regions (1, 4, 5, 9, 10, 11, 12, 13, 16, and 17) were randomly selected. In the second stage, 416 students having the above-mentioned criteria were randomly selected from each school based on the population share and the number of schools and students of each school in each region [Table 2].

The inclusion criteria were being grade five female student (aged 10–12 years), and studying in governmental schools, and the exclusion criterion was dislike to participate in the study. In each school, the selected students were asked to respond to the study questionnaire. The researcher was present while completing the questionnaire to help the students. The students were explained that if they answer honestly, this will help the researchers achieve proper information and improve knowledge.

Instruments

The data were collected by a researcher-designed questionnaire. The questionnaire had 8 items in relation to the demographic variables, 30 items on oral hygiene beliefs (HBM constructs) based on the dichotomy scale, and 3 items related to oral health behaviors. The items were related to perceived susceptibility with four questions (0–4), perceived severity with five questions (0–5), perceived benefits with four questions (0–4), perceived barriers with seven questions (0–7), cues to action with six questions (0–6), and self-efficacy with four questions (0–4). The performance measurement was conducted based on the three questions: brushing behavior frequency (brushing less than twice a day = 0, brushing twice a day or more = 1), use of dental floss daily (dental floss once a week or less than once a day = 0, dental floss once a day or more = 1), and reasons for visiting dentist (decay/pain/break = 0, six months check = 1). The items were derived from previous studies on the topic.[3,15,16,33,34] The content validity was performed through expert panel of fourteen specialists; four health education experts, five school health teachers, and five dentists who have worked on administered oral health in the Ministry of Health. The mean content validity ratio and content validity index were calculated as 0.66 and 0.83, respectively. The construct validity was assessed by performing explanatory factor analysis, and its reliability was evaluated by assessing internal consistency. The root mean square of residuals was 0.04, Tucker-Lewis Index of factoring reliability was equal to 0.918, and root mean square error of approximation index was 0.035 with 90% CIs of 0.026–0.038, indicating acceptable fit indices in EFA. In this study, Cronbach's alpha reliability coefficients for various construct scales ranged from 0.72 to 0.80, indicates an acceptable internal consistency (the detailed results are not shown but are available from the main investigator).

Procedures and ethical considerations

The Medical Ethics Committee of Tarbiat Modares University confirmed this study (IR. TMU. REC.1394.242). In addition, the Health and Education's Ministry confirmed the study in Iran under the number 316/2880 in Date October 11, 2017.

Data analysis

The SPSS software ver. 22 (SPSS Inc., IBM, and Chicago, IL, USA) was used to analyze the data. Descriptive statistics and Chi-square were used to explore the data. Simple logistic regression and multiple logistic regression were performed to evaluate the association of

Table 2: Sampling method in 10 educational districts of Tehran

Regions	Five female student populations	Number of governmental schools	Number of students in each school	Number of selected students
1	1600	52	30-32	32
4	4200	48	83-88	84
5	3800	56	60-68	76
9	2000	35	57-58	40
10	1400	20	68-70	28
11	1300	25	50-52	26
12	1800	37	48-49	36
13	1200	21	54-58	24
16	1700	23	70-74	34
17	1800	25	70-72	36

the children's oral health behavior with the independent variables. For all tests, the significance level was considered as 0.05 with SPSS Version 22.

Results

Totally, 416 grade five female students (aged 10–12 years) took part in the study. The mean age of the subjects was 10.88 ± 0.626 years. The demographic variables of the study population are shown in Table 1. About 44.7% of the students ($n = 186$) reported that they were brushing less than twice a day, and 323 students (77.6%) reported that they were using dental floss once a week or less than once a day. The main reasons for visiting the dentist was decay/pain/break (76.9%). While 230 students (55.3%) reported that they were brushing at least twice a day, 93 students (22.4%) reported that they were using dental floss at least once a day, and 23.1% reported checking their teeth every 6 months.

First stage
The recognition of effective demographic variables on oral health behaviors using Chi-square statistics. The related data are shown in Tables 3-5. Based on the results given in Table 3, the education of mothers ($P = 0.02$) and family income ($P = 0.03$) had significant relationship with the students' brushing behavior. The children's use of dental floss was significantly related to mother's job ($P = 0.01$) and family income ($P = 0.02$) [Table 4]. As shown in Table 5, parents' education (father's education level, $P = 0.001$ and mother's education level, $P = 0.000$)

and family income ($P = 0.04$) were the significant factors for the children's 6 months check of oral hygiene behavior.

Second stage
Using a logistic model for testing, the effect of six structures of HBM and demographic variables having a significant relationship with oral health behaviors. Tables 6-8 show the data used in the model. In order to find out the relationship between oral health behavior (brushing twice a day or more, use of dental floss once a day or more, and visit a dentist every 6 months) and independent variables, simple and multiple logistic regression analyses were carried out with six structures of HBM and demographic variables that were significant according to Tables 3-5. Mother's education ($P = 0.040$), family income ($P = 0.026$), and self-efficacy ($P = 0.001$) predicted the students' behavior of teeth brushing twice a day or more when they were separately entered into the model [Table 6]. However, after adjustment, only perceived self-efficacy ($P = 0.012$) remained significant [Table 6], so that one unit increase in perceived self-efficacy increased the possibility of teeth brushing at least twice a day by 1.34 times (odds ratio [OR] = 1.34, 95% confidence intervals [CI] = 1.06–1.69, $P = 0.012$). The results showed that the students' use of dental floss was significantly related to mother's job ($P = 0.015$), family income ($P = 0.030$), perceived benefits ($P = 0.024$), and perceived self-efficacy ($P = 0.001$) when they were separately entered into the model [Table 7]. Nevertheless, after adjustment, mother's job ($P = 0.025$)

Table 3: Demographic characteristics of the students and some factors affecting on their brushing behavior

Demographic variables	Brushing behavior			Significance level
	Brushing less than twice a day, *n* (%)	Brushing at least twice a day, *n* (%)	Total, *n* (%)	
Father's education level	186 (44.7)	230 (55.3)	416 (100)	
Illiterate/primary school	25 (54.3)	21 (45.7)	46 (100)	0.3
Secondary school/high school/diploma	98 (43.4)	128 (56.6)	226 (100)	
Higher than diploma	63 (43.8)	81 (56.3)	144 (100)	
Mother's education level				
Illiterate/primary school	26 (51)	25 (49)	51 (100)	0.03
Secondary school/high school/diploma	107 (48.9)	112 (51.1)	219 (100)	
Higher than diploma	53 (36.3)	93 (63.7)	146 (100)	
Father's job				
Worker	25 (61)	16 (39)	41 (100)	0.08
Private	92 (43.2)	121 (56.8)	213 (100)	
Employee	69 (42.6)	93 (57.4)	162 (100)	
Mother's job				
Housekeeper	142 (44.8)	175 (55.2)	317 (100)	0.9
Employed	44 (44.4)	55 (55.6)	99 (100)	
Family income				
Low	13 (56.5)	10 (43.5)	23 (100)	0.02
Appropriate	96 (51.1)	92 (48.9)	188 (100)	
Well	46 (40.4)	68 (59.6)	114 (100)	
Excellent	31 (34.1)	60 (65.9)	91 (100)	

Table 4: Demographic characteristics of the students and some factors affecting on their dental floss use behavior

Demographic variables	Use of dental floss			Significance level
	Less than once a day, *n* (%)	At least once a day, *n* (%)	Total, *n* (%)	
Father's education level	323 (77.6)	93 (22.4)	416 (100)	
Illiterate/primary school	37 (80.4)	9 (19.6)	46 (100)	0.8
Secondary school/high school/diploma	173 (76.5)	53 (23.5)	226 (100)	
Higher than diploma	113 (78.5)	31 (21.5)	144 (100)	
Mother's education level				
Illiterate/primary school	40 (78.4)	11 (21.6)	51 (100)	0.06
Secondary school/high school/diploma	179 (81.7)	40 (18.3)	219 (100)	
Higher than diploma	104 (71.2)	42 (28.8)	146 (100)	
Father's job				
Worker	33 (80.5)	8 (19.5)	41 (100)	0.8
Private	164 (77)	49 (23)	213 (100)	
Employee	126 (77.8)	36 (22.2)	162 (100)	
Mother's job				
Housekeeper	255 (80.4)	62 (19.6)	317 (100)	0.01
Employed	68 (68.7)	31 (31.3)	99 (100)	
Family income				
Low	18 (78.3)	5 (21.7)	23 (100)	0.02
Appropriate	158 (84)	30 (16)	188 (100)	
Well	84 (73.7)	30 (26.3)	114 (100)	
Excellent	63 (69.2)	28 (30.8)	91 (100)	

Table 5: Demographic characteristics of the students and their reasons for visiting dentist

Demographic variables	Reasons for visiting dentist			Significance level
	Decay/pain/break, *n* (%)	6 months check, *n* (%)	Total, *n* (%)	
Father's education level	320 (76.9)	96 (23.1)	416 (100)	
Illiterate/primary school	38 (82.6)	8 (17.4)	46 (100)	0.001
Secondary school/high school/diploma	186 (82.3)	40 (17.7)	226 (100)	
Higher than diploma	96 (66.7)	48 (33.3)	144 (100)	
Mother's education level				
Illiterate/primary school	43 (84.3)	8 (15.7)	51 (100)	0.000
Secondary school/high school/diploma	185 (84.5)	34 (15.5)	219 (100)	
Higher than diploma	92 (63)	54 (37)	146 (100)	
Father's job				
Worker	34 (82.9)	7 (17.1)	41 (100)	0.06
Private	171 (80.3)	42 (19.7)	213 (100)	
Employed	115 (71)	47 (29)	162 (100)	
Mother's job				
Housekeeper	250 (78.9	67 (21.1)	317 (100)	0.09
Employed	70 (70.7)	29 (29.3)	99 (100)	
Family income				
Low	22 (95.7)	1 (4.3)	23 (100)	0.04
Appropriate	150 (79.8)	38 (20.2)	188 (100)	
Well	83 (72.8)	31 (27.3)	114 (100)	
Excellent	65 (71.4)	26 (28.6)	91 (100)	

and self-efficacy ($P = 0.007$) were found to be significantly related to the use of dental floss once a day or more. The increase of perceived self-efficacy by one unit, the possibility of using dental floss at least once a day will increase by 1.61 times (OR = 1.61, 95% CI = 1.14–2.27, $P = 0.007$). In addition, in employed mothers comparing to housewife mothers' the possibility of their children's use of dental floss at least once a day is about two times higher (OR = 1.83, 95% CI = 1.07–3.10, $P = 0.025$) [Table 7].

Logistic model results showed that the behavior of visiting the dentist every 6 months was significantly related to mother's education ($P = 0.000$), father's education (0.002), cues to action ($P = 0.023$), and

Table 6: Factors predicting brushing at least twice a day among students

Brushing behavior	B	Simple OR (95% CI)	P	B	Multiple OR (95% CI)	Significance level
Mother's education			0.04			0.106
Illiterate/primary school	−0.602	0.54 (0.288-1.044)	0.067	−0.448	0.63 (0.32-1.27)	0.203
Secondary school/high school/diploma	−0.517	0.59 (0.388-0.916)	0.018	−0.477	0.62(.39-.97)	0.038
Higher than diploma		Reference category			Reference category	
Income			0.026			0.153
Low	−0.923	0.39 (0.157-1.009)	0.052	−0.58	0.56 (0.20-1.49)	0.248
Appropriate	−0.703	0.49 (0.29-0.83)	0.008	−0.578	0.56 (0.32-0.96)	0.035
Well	−0.269	0.76 (0.43-1.35)	0.356	−0.214	0.80 (0.44-1.45)	0.476
Excellent		Reference category			Reference category	
Perceived susceptibility	0.154	1.16 (0.91-1.493)	0.222	0.437	1.11 (0.84-1.47)	0.437
Perceived severity	0.023	1.02 (0.84-1.23)	0.811	0.905	0.98 (0.80-1.20)	0.905
Perceived benefits	0.237	1.26 (0.96-1.67)	0.095	0.353	1.15 (0.85-1.56)	0.353
Perceived barriers	−0.154	0.857 (0.70-1.03)	0.116	0.754	0.96 (0.76-1.21)	0.754
Cues to action	0.123	1.13 (0.97-1.30)	0.099	0.511	1.05 (0.89-1.23)	0.511
Self-efficacy	0.368	1.44 (1.16-1.78)	0.001	0.012	1.34 (1.06-1.69)	0.012

OR=Odds ratio, CI=Confidence interval

Table 7: Factors predicting use of dental floss at least once a day among students

Use of dental floss	B	Simple OR (95% CI)	P	B	Multiple OR (95% CI)	Significance level
Mother's job	−0.629	0.533 (0.32-0.88)	0.015	0.604	1.83 (1.07-3.10)	0.025
Income			0.03			0.056
Low	−0.47	0.62 (0.21-1.85)	0.396	−0.284	0.752 (0.24-2.30)	0.618
Appropriate	−0.85	0.42 (0.23-0.77)	0.005	−0.811	0.444 (0.24-0.82)	0.009
Well	−0.219	0.80 (0.43-1.47)	0.482	−0.229	0.795 (0.42-1.50)	0.479
Excellent		Reference category			Reference category	
Perceived susceptibility	0.184	1.20 (0.87-1.64)	0.252	0.221	1.24 (0.87-1.78)	0.228
Perceived severity	0.083	1.08 (0.86-1.36)	0.475	0.064	1.06 (0.83-1.37)	0.615
Perceived benefits	0.457	1.57 (1.06-2.34)	0.024	0.335	1.39 (0.93-2.10)	0.107
Perceived barriers	−0.137	0.87 (0.68-1.11)	0.279	0.032	1.03 (0.78-1.36)	0.823
Cues to action	0.034	1.03 (0.86-1.23)	0.704	−0.087	0.917 (0.75-1.11)	0.377
Self-efficacy	0.548	1.73 (1.25-2.39)	0.001	0.478	1.61 (1.14-2.27)	0.007

OR=Odds ratio, CI=Confidence interval

perceived benefits ($P = 0.006$), when simple logistics model was performed. After adjustment, the logistic model showed that mother's education ($P = 0.004$) and perceived benefits ($P = 0.011$) had a significant effect on visiting the dentist every 6 months [Table 8]. Despite the impact of mother's education on visiting the dentist every 6 months, in the mothers who had the education of secondary school/high school/diploma comparing to higher than diploma mothers, the possibility of their children's (6 months check by dentist) was about 0.35 times lower (OR = 0.35, 95% CI = 0.189–0.65, $P = 0.001$). As shown in Table 8, one unit increase in the perceived benefits increased the possibility of visiting the dentist every 6 months by 1.78 times (OR = 1.78, 95% CI = 1.14–2.77). The findings showed that this construct had a strong power in predicting the students' 6 months check behavior.

Discussion

The current survey was designed to investigate the predictors of oral health behavior among female students within the framework of HBM.

The findings showed that parents' educational level, family income, and mothers' job had significant relationship with the oral health behaviors such as regular brushing, flossing, and 6 months check. In line with these findings, other studies have reported a significant relationship between the education level of parents, family income, mothers' job, and oral health behavior in students.[35-37] Hence, unemployed (homemaker) mothers and parents with low education need to be in the priority group in the oral health educational programs for students. Based on the results of this study, perceived self-efficacy was the most important factor in predicting tooth brushing in young adolescents. We realized that one unit increase in perceived self-efficacy increased the possibility of brushing twice a day or more by about 1.34 times. In addition, it was revealed show that one unit increase in perceived self-efficacy increased the possibility of desirable behavior of using dental floss (at least once a day) by more than 1.5 times. While in employed mothers comparing to homemaker mothers, the possibility of their children's use of dental floss at least once a day was about two times

Table 8: Factors predicting 6 months check among students

6 months check	B	Simple OR (95% CI)	P	B	Multiple OR (95% CI)	P
Mother's education			0.000			0.004
Illiterate/primary school	−1.149	0.31 (0.139-0.72)	0.006	−0.852	0.42 (0.150-1.21)	0.11
Secondary school/high school/diploma	−1.161	0.31 (0.191-0.51)	0.000	−1.044	0.35 (0.189-0.65)	0.001
Higher than diploma		Reference category			Reference category	
Father's education			0.002			0.789
Illiterate/primary school	−0.865	0.42 (0.18-0.97)	0.043	−0.158	0.85 (0.29-2.45)	0.769
Secondary school/high school/diploma	−0.844	0.43 (0.26-0.70)	0.001	−0.218	0.80 (0.43-1.49)	491
Higher than diploma		Reference category			Reference category	
Income			0.081			0.445
Low	−2.175	0.11 (0.01-0.88)	0.038	−1.598	0.202 (0.02-1.66)	0.137
Appropriate	−0.457	0.63 (0.35-1.12)	0.121	−0.192	0.825 (0.44-1.53)	0.544
Well	−0.069	0.93 (0.50-1.72)	0.827	0.016	1.016 (0.52-1.95)	0.962
Excellent		Reference category			Reference category	
Perceived susceptibility	0.075	1.07 (0.80-1.45)	0.623	−0.009	0.99 (0.73 -1.21)	0.959
Perceived severity	0.034	1.03 (0.82-1.29)	0.768	−0.061	0.94 (0.73-1.21)	0.636
Perceived benefits	0.58	1.78 (1.18-2.17)	0.006	0.578	1.78 (1.14-2.77)	0.011
Perceived barriers	−0.073	0.93 (0.73-1.17)	0.543	0.033	1.03 (0.78-1.36)	0.817
Cues to action	0.218	1.24 (1.03-1.50)	0.023	0.189	1.20 (0.98-1.48)	0.076
Self-efficacy	0.245	1.27 (0.975-1.67)	0.075	0.109	1.11 (0.83-1.49)	0.468

OR=Odds ratio, CI=Confidence interval

higher. Self-efficacy is the belief in one's capabilities to organize and execute the sources of action required to manage prospective situations.[27] In general, it can be said that self-efficacy is the only structure of HBM in predicting the brushing behavior and use of dental floss. Accordingly, it seems that students with high level of self-efficacy have high performance, brushing behavior, and use of dental floss higher. Although mother's job enhances this behavior (use of dental floss), according to the data, the study carried out by Rahmati *et al*. showed that self-efficacy had the highest percent of total variance observed in dental health behaviors.[14] Burglar *et al*., in a study on the role of self-efficacy in dental patients' brushing and use of dental floss, found that, self-efficacy significantly predicted both of the oral hygiene behaviors also.[3] While some studies do not support that perceived self-efficacy could predict a behavior change. For example, the study by Kasmaee *et al*. indicated that perceived objective severity and feeling less perceived psychological barriers were the significant predicting factors for brushing twice a day,[15] maybe because of the age range of the participants who were in adolescence age. Bandore describes perceived self-efficacy perceptions as "a key factor in a generative system of human competence." These perceptions are "concerned not with the number of skills you have, but with what you believe you can do with what you have under a variety of circumstances."[38] Adolescents' beliefs about their capabilities to produce results by their actions are an influential personal resource as they negotiate their lives through the life cycle. Self-efficacy is a key belief underlying adolescents' motivation to act intentionally. Changing health-related behaviors requires two separate processes that involve motivation

and volition, respectively. First, an intention to change is developed in part on the basis of self-beliefs. Second, the change must be planned, initiated, and maintained, and relapses must be managed. Self-efficacy plays a critical role in these processes. Perceived self-efficacy is the only predictor that seems to be equally important in the above two phases for adolescents.[39]

In this study, the main reasons of 76.9% of the students for visiting the dentist were decay/pain/break. This finding confirms the findings of Kasmaee *et al*. that 77% of the students claimed the main reasons for visiting the dentist as decay/pain/break.[15] On the other side, the results show that in addition to mother's education, another most important structure of HBM in predicting the behavior of visiting the dentist every 6 months was perceived benefits, such that, one unit increase in perceived benefits increased the possibility of desirable behavior (6 months check) by about two times. Maternal education had a lesser impact on the probability of going to the dentist by students (6 months check) (in mothers with secondary school/high school/diploma education comparing to higher diploma mothers, the possibility of their children's 6 months check by dentist was about 0.35 times lower). Our findings showed that this construct had a strong power in predicting visiting to dentist. Perceived benefits refer to belief in the advantages of the methods suggested for reducing the risk or seriousness of the disease or harmful state resulting from a particular behavior. In facilitating the construct of perceived benefits, health educators need to specify the exact action to be taken and specify the advantages or benefits that would result from that course of action.[27]

Interestingly, we found that family income had not important role in predicting 6 months check by dentist. Likely Iran's Ministry of Education by coordination with the Ministry of Health has implemented programs to improve students' oral health, including free admission by a dentist in school; this can be a reason for not predicting the income of the family. However, for the first time, we found that perceived benefits can be predict the behavior of visiting the dentist every 6 months. This suggests that adolescents who acquire more perceived benefits and regularly visit a dentist are more sensitive to, or are aware of their own oral health, and that regular checkups can help to improve oral health. All participants in this study were female students in Tehran (Capital of Iran), so caution in interpretation is needed in generalizing the findings to male students or even other populations. Further studies with similar age groups are necessary for confirming the findings. Self-reporting is another limitation to generalize the findings.

Conclusion

The present study revealed that, Iranian adolescents represent behavior that results in poor oral health, primarily due to infrequent brushing and flossing and type of visit to a dentist. Health educators should put emphasis on the important role of self-efficacy and perceived benefits in the framework of oral health educational interventions.

Conflicts of interest
There are no conflicts of interest.

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