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Factors predicting the oral health behaviors of the Iranian students in the District 1 Tehran, Iran.

Short running: oral health prediction

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Abstract

Aim: The purpose of this examination is determining predictors to oral health behaviors predict in Iranian students in district 1 Tehran based on the health belief model with added Commitment to plan construct.

Methods: This cross-sectional study was conducted on 351 four grade female students in the first district of Tehran, Iran in 2017. The random Multi-stage random cluster sampling method was used to recruit students. The inclusion criteria were being graded, four female students (aged 9-11 years), or Education at the fourth grade of one of the elementary schools studied in the first district of Tehran and, The health of the student from a physical and psychological of view. Logistic regression analysis was used to identify the variables that predict oral health behaviors.

Results: The total 31.8% of the students reported that they were brushing behavior less than twice a day and 55.2% students claimed, use of dental floss behavior once a week or less than once a day. The results indicated that perceived self-efficacy (OR=1.46, 95% CI=0.57-3.78, P<0.001), Commitment to plan (OR=1.13, 95% CI=1.04-1.23, P<0.001) and Cues to action (OR=1.42, 95% CI=1.14–1.76, P=0.002) were the significant predicting variables which is the key factor of brushing twice a day, and use of dental floss once a day or more (OR=1.02, 95% CI=0.23-3.53, P=0.003).

Conclusion: This study has shown the effectiveness of the health belief model with added Commitment to plan construct to predict oral health behavior in female students. So, it seems that the model as a framework for designing training programs to improve students to improve oral health behavior can be used.

Key words: Oral Health; Students, Medical, Behavior, Iran.

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Introduction

Oral disorders are the most common health problems. Studies have shown that one of the commonest problems of early life is dental caries and oral diseases. Oral health is a part of the public health and essential to enhancing the quality of life[1]. Primarily based on the precept that prevention and training are the satisfactory manners of promoting oral health collectively, that extra prematurely preventive measures and interruption on disease evolution are established more effective might be the results[2].

Distribution and severity of oral conditions vary in different components of the world and this is also real for specific geographic conditions within the equal country or area[3]. According to a countrywide oral health survey performed in 2012, indicated a high level of carries inside the primary dentition and the mean DMFT index become pronounced with 5.16/0.38 in 6-year-old children[4].

Behavior elements and factors are received in early childhood and there is a strong mother or care. There is the fact that habits are at this age and caries in the first teeth[2]. Brushing and flossing are the very best methods to reduce the incidence of plaque[5].

In addition, health education is considered a critical method for health promotion, now not best by the impact and voluntary wonderful adjustments within the individual's way of life and health habits; additionally, it improves familiar and community behavior, producing political behaviors that allow the development of new strategies to promote health and enhance the quality of lifestyles of the populace[2, 6]. The implementation and effectiveness of educational preventive programs have become relevant because of the interception of risk factors for oral diseases, knowledge acquisition and consequently behavioral changes[6].

In health education; the use of models and theories of health behavior to interventions is recommended because they can cause powerful health education programs. In fact, the models

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provide a framework for expertise on how people analyze and the way they behave and why humans behave as they offer[7]. The Health Belief model method is a comprehensive model that can be used for organizing educations. The HBM is a number of the first models which were advanced for regulating health-related behaviors[8]. On this version there are specific patterns of social-cognitive predictors can also appear (Figure 1) the construct of "Commitment to Plan of Action" from "Health Promotion Model Added to HBM model.

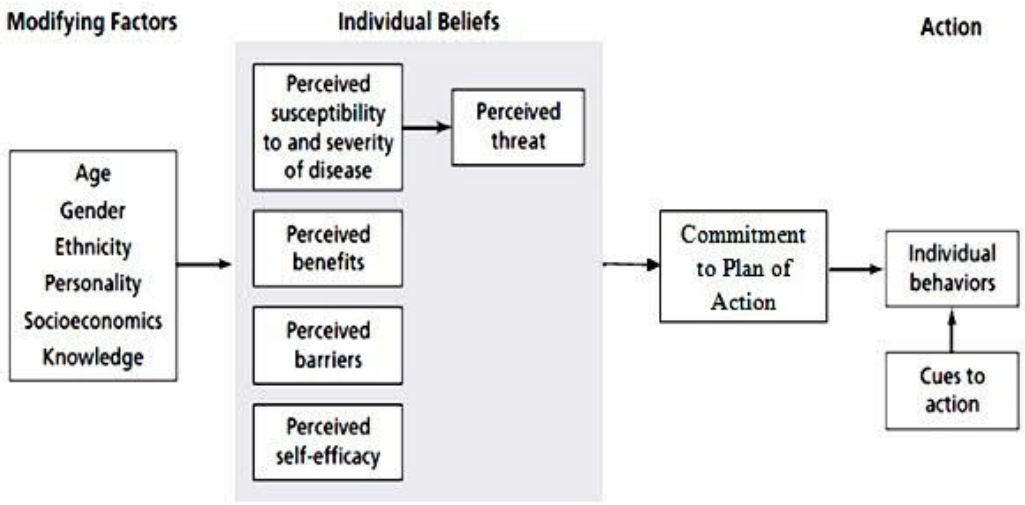

Figure 1. Flow Diagram of the expanded Health Belief model with the construct of "Commitment to Plan of Action" from "Health Promotion Model.

The model assumes that different factors, consisting of the perceived severity of health trouble, perceived benefits, and perceived barriers preventing people from assignment preventive behaviors, affect health related beliefs and behaviors[9]. The purpose of this examination is determining predictors to oral health behaviors example teeth brushing frequency, dental floss frequency and in Iranian students in district 1 Tehran based on the health belief model with added Commitment to plan construct.

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Materials and methods

Study design and participants

The study was cross-sectional, which was conducted on the grade four female students (9-11 years) of schools in the first district of Tehran on April 21, 2017, for 2 months. To obtain samples from among the 33,179 female students (grade four) studying in this Urban-rural, a Multi-stage random cluster sampling method was used.

In the first stage, out of 162 schools (145 urban schools and 17 rural schools), 10 schools [Urban schools (N=6) and Rural schools (N=4)] were randomly selected.

In the second stage, From 351 students with it were random Based on the share of the population from each school and the number of schools and students in each school after declines 43 students, Assessed for eligibility (n=308) (Table 1).

The inclusion criteria were being graded, four female students (aged 9-11 years), or Education at the fourth grade of one of the elementary schools studied in the first district of Tehran and, The health of the student from a physical and psychological point of view and the exclusion criterion was Student or parent's disagreement with the student company in the study and, the student determines the confrontation with their company in the study, 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 defined in the event that they to answer truly, this may assist the researchers to acquire the right information and improve knowledge (Figure 2).

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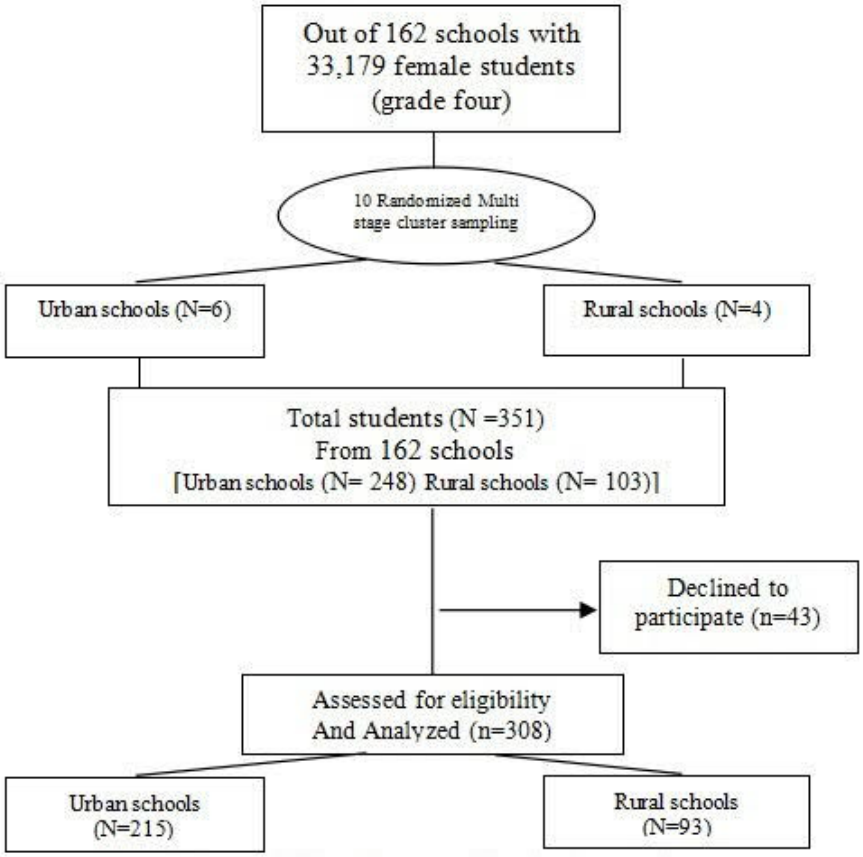

Figure 2. Flow diagram of student's recruitment.

Results

Totally, 308 four grade female students in the first district of Tehran took part in the study. The mean age of the subjects was 9.32 ± 0.8 years. The demographic variables of the study population are shown in Table 1, 2. About 31.8% of the students (n =98) reported that they were brushing behavior less than twice a day, and 170 students (55.2%) reported that they used once a week or after using dental floss behavior or less than once a day. While 210 students (68.2%) reported that they brush behavior at least two twice a day, 138 students (44.8%) reported that they were using dental floss behavior at least once a day. The results indicated that perceived self-efficacy (OR=1.46, 95% CI=0.57-3.78, P<0.001), Commitment to plan (OR=1.13, 95% CI=1.04-1.23, P<0.001) and Cues to action (OR=1.42, 95% CI=1.14–1.76, P=0.002) were the

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significant predicting variables which is the key factor of brushing twice a day, and use of dental floss once a day or more (OR=1.02, 95% CI=0.23-3.53, P=0.003).

Table1. Demographic characteristics affecting of the students brushing behavior

Demographic variables	Brushing frequency	
	less than twice a day	twice a day or more
	N (%)	N (%)
	98(31.8)	210(68.2)
Father's educational level		
Primary	20(20.4)	54(25.7)
High school	35(35.7)	66(31.4)
Higher educational	43(43.9)	90(42.9)
P-value	**0.03**	
Mother's educational level		
Primary	23(23.5)	43(20.5)
High school	31(31.6)	80(38.1)
Higher educational	44(44.9)	87(41.4)
P-value	**0.07**	
Father's job		
Private	75(76.6)	147(70)
Employee	23(23.4)	63(30)
P-value	**0.08**	
Mother's job		
Un Employed	50(51)	110(52.4)
Employed	48(49)	100(47.6)
P-value	**0.1**	
Income		
Low	10(10.2)	16(7.6)
Appropriate	13(13.3)	17(8.1)
Well	16(16.3)	87(41.4)
Excellent	59(60.2)	90(42.9)
P-value	**0.04**	

First stage

The recognition of effective demographic variables on oral health behaviors using Chi-square statistics. The related data are shown in Tables 1 and 2.

Based on the results given in Table 1, the education of mothers and Father's educational level respectively (p=0.07; p=0.03), the Father's job (p=0.09), and income (P = 0.04) had a significant relationship with the students' brushing behavior.

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Table2. Demographic characteristics affecting of the students dental floss behavior

Demographic variables	Dental floss frequency	
	once a week or less than once a day	once a day or more
	N (%)	N (%)
	170(55.2)	138(44.8)
Father's educational level		
Primary	38(22.4)	34(24.6)
High school	65(38.2)	48(34.8)
Higher educational	67(39.4)	56(40.6)
P-value	**0.03**	
Mother's educational level		
Primary	33(19.4)	33(23.9)
High school	67(39.4)	47(34)
Higher educational	70(41.2)	58(42.1)
P-value	**0.5**	
Father's job		
Private	164(96)	89(64.5)
Employee	126(74)	49(35.5)
P-value	**0.04**	
Mother's job		
Un Employed	115(67.6)	73(52.9)
Employed	55(32.4)	65(47.1)
P-value	**0.8**	
Income		
Low	30(17.7)	24(17.4)
Appropriate	32(18.8)	22(15.9)
Well	31(18.2)	24(17.4)
Excellent	77(45.3)	68(49.3)
P-value	**0.2**	

The children's use of dental floss behavior was significantly related to the Father's job (P = 0.04), Father's educational level (P = 0.03) (Table 2).

Table3. Factors predicting brushing behavior at least twice a day among of students

Brushing behavior	*B*	Simple OR (95% CI)	P-Value	*B*	Multiple OR (95% CI)	P-Value
Mother's educational level			0.005			0.108
Primary	0.16	1 (0.40-2.51)	1.32	0.19	1.14(0.54-2.65)	0.26
High school	0.47	1.60(0.92-2.78)	0.63	0.38	1.46(0.57-3.78)	0.02
Higher educational	0.57	1.78(0.66-4.74)	0.01	0.52	1.65(0.97-2.83)	0.01
Income			0.008			0.123
Low	0.18	1.12(0.52-2.63)	0.12	0.15	1.01(0.53-1.90)	0.24
Appropriate	0.23	1.24(1.14-1.38)	0.18	0.20	1.13(0.53-2.64)	0.18
Well	0.28	1.36(0.47-3.68)	0.02	0.25	1.18(0.41-2.59)	0.01
Self-efficacy	0.38	1.46(0.57-3.78)	<0.001	0.35	1.42(1.14-1.76)	0.012
Commitment to plan	0.18	1.13(1.04-1.23)	<0.001	0.15	1.02(0.36-2.52)	0.014
Cues to action	0.16	1.02(0.23-3.53)	0.003	0.12	1 (0.87-1.26)	0.023

OR = odds ratio, CI = confidence interval

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. Tables3, 4show the data used in the

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model. In order to find out the relationship between oral health behavior and independent variables, simple and multiple logistic regression analyses were carried out with five-six structures of HBM and demographic variables that were significant according to Tables 3, Mother's education (P =0.005), income (P =0.007), self efficacy, Commitment to plan (P <0.001) and Cues to action (P =0.003) predicted the students' behavior of Dental floss at least twice a day.

However, after adjustment, only perceived self-efficacy, Commitment to plan, Cues to action remained significant, so that one unit increase in perceived self efficacy increased the possibility of teeth Brushing behavior at least twice a day by 1.42 times, Commitment to plan by 1.02 times Cues to action by times.

Table4. Factors predicting use dental floss behavior at least once a day among of students

Dental floss behavior	*B*	Simple OR (95% CI)	P-Value	*B*	Multiple OR (95% CI)	P-Value
Mother's job			0.006			0.012
Father's educational level			0.004			0.113
Primary	0.18	1.20(0.54-2.70)	0.61	1.19	0.78(0.37-1.69)	0.23
High school	0.47	1.60(0.92-2.78)	0.01	0.28	1.36(0.47-2.68)	0.01
Higher educational	2.61	0.74(0.33-1.65)	0.03	0.52	1.65(0.97-2.83)	0.01
Income			0.007			0.104
Low	-0.56	0.56(0.18-1.72)	0.31	0.45	1.31(0.83-2.43)	0.28
Appropriate	-0.034	0.96(0.31-3.01)	0.95	0.20	1.15(0.55-2.66)	0.23
Well	0.13	1.14(0.35-3.65)	0.81	0.21	1.12(0.35-2.53)	0.01
Self-efficacy	0.53	1.78(0.66-4.74)	<0.001	0.36	1.30(0.99-2.34)	0.016
Commitment to plan	0.18	1.13(1.043-1.23)	<0.001	0.15	0.89(0.38-1.54)	0.21
Cues to action	0.16	1.02(0.23-3.53)	0.003	0.14	1.02(0.89-3.44)	0.002

OR = odds ratio, CI = confidence interval

The results showed that the students' use of dental floss behavior was significantly related to the mother's job (P = 0.006), Father's educational level (P = 0.004), income (P =0.007) perceived self efficacy (P <0.001), Commitment to plan (P <0.001), and Cues to action (P = 0.003). When they were separately entered into the model (Table 4) Nevertheless, after adjustment, mother's job (P = 0.012) and self efficacy (P =0.016) 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

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possibility of using dental floss at least once a day will increase by 1.30 times (OR = 1.30, 95% CI = 0.99-2.34, P = 0.016).

Discussion

The current survey was designed to investigate the predictors to oral health behaviors are expecting in Iranian students in district 1 Tehran based on the health belief model with added Commitment to plan construct Consistent with this examine findings, other research has mentioned a significant relationship between the education level of mother and father As Aggarwal study[10] Contrary to the Pourhaji study, there was no significant relationship between education level and oral health behaviors the two groups [1], a significant relationship between income, Father's job, dental floss behavior and brushing behavior in students same Phanthavong study[11].

This study results indicated that perceived self-efficacy, Cues to action, and Commitment to plan were the significant predicting variables which is the key factor of teeth brushing and Brushing behavior at least twice a day, and use of dental floss and Brushing behavior once a day or more. According to the data, respectively the study carried out by Rahnama et al study[12]and Hazavei study et al[13] showed that self-efficacy, Cues to action had the highest percent of total variance observed in dental health behaviors.

But in there was a constrained correlation between oral health perceptions and elevated perceived benefits in solhi study[14] .Maria et al study on the role of self-efficacy in dental patients' brushing and flossing, found that, barriers emerging, and self-efficacy significantly predicted brushing and flossing behaviors also[15].

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However, it had no significant relation like the current study with perceived benefits and in contrast to current cues to action[16]. Maybe because of the age range of the participants who were in five-grade age and by gender.

Within the charkazi study, besides for perceived barriers (with negative correlation), all constructs of HBM were definitely associated with oral health behaviors. Self-efficacy was the most powerful predictor of oral health behavior[17]. The kasmaei findings recommend that perceived objective severity and perceived psychological barriers play an important position in adopting acceptable health behavior among younger young people[18].

Moreover, according to the present study, numerous researches have revealed that commitment to plan has been as the best predictor variable for actual oral health behaviors[19-20]. Therefore, strategies for enhancing commitment to plan in practice, such as strengthening Self-extinguishing techniques, Enhance commitment, Pursuit of commitment and focus groups discussion could lead to more effective oral health behaviors programs for Iranian students and should be considered in future intervention[21-22]. These programs could propose that highly commitment to plan individuals exert greater efforts to empowering individuals to prevent them from returning to unhealthy behavior[23]. Pender stated that more commitment to plan could have a much impact on continuing health promotion behaviors[24].

In this study, the variables of cues to action with a positive relationship were demonstrated to be significant predictors for oral health behaviors among the Iranian students. This finding is supported by many previous studies which found that Cues to action are stimuli that trigger appropriate health behaviors. Cues can be either internal, that is, the perception of bodily states, or external, that is, stimuli from the environment, such as interpersonal interactions or the mass media[25-26]. In the current study, there was also a relationship between Self-efficacy and oral

health behaviors. Similar to the present study, Self-efficacy was the most predictive factors of oral health behaviors. These results are consistent with previous studies[27-29].

Limitations

There are several limitations to this study. First, the statistics used on this evaluation were amassed via a cross-sectional design in addition to assessing oral health behaviors as self-report, in which humans typically might record the conduct better than the real amount. Furthermore, this observes changed into based totally on a comfort sample, so that it's locating of this study might not be generalized to all Iranian students groups to evaluate the real rate of behaviors and effective factor on them.

Conclusions

This study has shown the effectiveness of the health belief model with added Commitment to plan construct to predict oral health behavior in female students. So, it seems that the model as a framework for designing training programs to improve students to improve oral health behavior can be used. The finding of this study provides needed data assisting the development of model-based behavioral prevention interventions to encourage student's oral health behavior.

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Author contribution

M H D, FP conducted whole study and had full access to all data for analysis.

SST, AH, MHD supervised the study and also she was involved in drafting the article

SHN verified the data analysis. All authors confirmed the final version of the manuscript.

Finance/Disclosure

None declared.

Conflict of Interest

"The authors acclaimed that they have no rivaling interests".

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