Factors Affecting Oral Health Self-Care Behaviors in Seventh Grade Students in Behbahan City: An Application of the Health Belief Model

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Abstract

Background: Oral and dental diseases are among the most common diseases in the world that are usually initiated in childhood and adolescence. With risk factors like those of the other important non-contagious diseases, they cause pain, discomfort, deformity, and even death. As it is preventable, the promotion of the related care behaviors by identifying the effective factors is very important. Therefore, the present study aimed to determine the factors affecting oral health self-care behaviors in seventh-grade students in Behbahan city using the health belief model.

Method: This descriptive-analytical study was performed on 360 seventh-grade students in Behbahan city, Iran, through a two-stage cluster sampling. The data collection tool was a questionnaire designed based on the Health Belief Model and the DMFT checklist. The collected data were analyzed using SPSS software V. 20.

Results: The results showed that the mean DMFT index and students' performance score for oral health behaviors were 2.08 and 1.76, respectively. There was a significant difference between the two genders in terms of DMFT index and performance score (P = 0.007). In this study, there was a significant relationship between oral health behaviors and perceived sensitivity, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. There was also an indirect and significant relationship between perceived barriers and behavior (r = 0.271, p = 0.001).

Conclusion: Based on the results of this study, the structures of the health belief model were effective on students' oral self-care behaviors. Therefore, it is recommended to focus on the mentioned structures to promote these behaviors.

Key Words: Health belief model, Health-related behaviors, Oral health; students, Self-care.

1- INTRODUCTION

The World Health Organization considers oral health as a necessity and an important part of public health and quality of life (1). Poor oral health is associated with other chronic diseases such as diabetes and heart disease. It has common risk factors with other important non-contagious diseases (2).

The most common scale for measuring tooth decay is the DMFT index, which indicates the number of decayed, missed, and filled teeth, as well as the severity of the decay. The higher scores on this index indicates lower oral health and lower culture of prevention in society. One of the goals of the World Health Organization for oral health is to reduce the DMFT scores to lower than 1% (3). Unfortunately, the DMFT index among Iranian children is much higher than the global average (4). Untreated caries can lead to abscesses (severe infections) under the gums and spread to other parts of the body causing pain and infection along with problems in eating, talking, playing, and learning. Children with poor oral health often benefit less from learning and obtain scores lower than other children (2).

Prevention of tooth decay and gum disease emphasizes the implementation of oral health self-care behaviors including flossing and brushing, regular visits to the dentist, and fluoride therapy (5). The status of oral self-care behaviors in Iranian adolescents is unsatisfactory so that the rate of toothbrush and floss use is reported between 20-44% in Iranian teenagers (6). Due to the high prevalence of dental caries and their costly treatment, and considering the important role of the individual in preventing dental caries, it is necessary to promote oral health in teenagers by recognizing the effective factors in promoting self-care behaviors (7). A study in the United States has shown that teaching preventive behaviors in oral health increased the percentage of people who could maintain their natural teeth at an older age (8). There are theories and models in health education for designing appropriate educational interventions to change self-care behavior, establish proper health habits, and prevent the progression of the disease (9). One of the effective models in health education is the Health Belief Model. This model mainly focuses on disease prevention and the adopted behaviors to stop the displeasure and disease chain. It also shows the relationship between health beliefs and behaviors. It can increase perceived sensitivity (understanding the susceptibility to disease) and perceived severity (a person's perception of the seriousness of the disease) of the people about tooth decay. Moreover, it guides the person to observe oral health self-care behavior according to the benefits (a person's perception of the benefits of the behavior) and perceived barriers (a person's perception of problems in the way of conducting the behavior), cues to action (accelerating stimuli of the behavior), and self-efficacy (belief in the ability to perform the behavior) (10). Thus, regarding the high prevalence of dental caries in this age group and the importance of oral health for a healthy life, this study aimed at investigating the "Factors affecting oral health self-care behaviors in seventh-grade students in Behbahan city, Iran, using the health belief model.

2- MATERIALS AND METHODS

In this descriptive-analytical study, we studied 360 seventh grade male and female students in the first secondary school in Behbahan, Iran. Inclusion criteria were willingness to participate in research and health certification, and exclusion criteria included changing the school or being unavailable. All first secondary schools were considered as a cluster, among which exceptional and private schools were removed to extract public schools. In the next stage, between public

schools, two girls' schools and two boys' schools were randomly selected and 90 students were randomly selected from the official list as a sample. It should be noted that all schools in the city are considered within a single district due to their almost uniform texture in terms of economic, cultural, and social background.

The sample size was calculated in line with the results of a similar study (11) based on the prevalence formula. According to several studies, the prevalence of tooth decay is very variable within the range of 25% to 90% (12). In the present study, the lowest prevalence of 25% was used as a criterion for determining the sample size. Taking into account the 95% confidence level and 80% test power, by substituting the values in the equation, the sample size was calculated as 340 people. The number of samples increased to 360 considering a 15% probability of data loss.

$$n = \frac{\left(z_{1-\frac{\alpha}{2}}\right)^2 pq}{d^2}$$

The data collection tool was a checklist to determine the status of dental caries in students accompanied by a questionnaire based on the health belief model. Based on the checklist, the students were examined directly by a dentist in a dental clinic. This checklist was extracted from the dental examination form. The number of decayed, extracted, and restored teeth in students was examined. Demographic questions included the number of the family members, parents' occupation, parents' education, and birth rank. The model-based questionnaire was designed in several sections with a 5-point Likert rating scale, from strongly disagree (1) to strongly agree (5). Eight questions were related to measuring tooth decay prevention behaviors about dental hygiene, including brushing and flossing, scored based on a Likert scale, from always (4) to never (0). The questionnaire was provided to health education specialists and dentists and the content validity ratio and content validity index were calculated as 0.93 and 0.96, respectively. To measure the reliability of the questionnaire, the Cronbach's alpha coefficient of the scales was calculated ($\alpha > 0.7$).

2-1. Ethical Considerations

This study was approved by the ethics code of IR.BHN.REC.1397.025 in Behbahan Faculty of Medical Sciences. All participants completed the informed consent form and entered the study with personal consent.

2-2. Data Analysis

In this study, descriptive and analytical statistical tests were used to analyze the data. Mean central index, standard deviation scatter index, frequency, and percentage were used for descriptive information. Pearson correlation coefficient analytical test was used to determine the relationship between health belief model structures and oral hygiene behavior. All analyses were done using SPSS V.20. P values less than 0.05 were considered significant in this study.

3- RESULTS

From among 360 students, 48.6% were girls and 51.4% boys. Moreover, 50.3% of the participants' fathers were employees and 73.6% of the mothers were housewives. The highest level of education among the fathers was university education (43.6%) while it was a diploma among the mothers (47.5%). There were no significant relationships between demographic variables and the structures of the health belief model and oral health behaviors ($p > 0.05$) (**Table 1**).

The mean DMFT score in all samples was 2.08 ± 2.14 which was higher in female students. Statistical analysis showed a significant difference between the scores of the two groups in DMFT (p =0.001) (**Table 2**).

Table-1: Relationship between demographic variables and structures of health belief model

Variable	Number of family members	Birth rank	Father's occupation	Mother's occupation	Father's education	Mother's education
Perceived sensitivity	0.231	0.986	0.384	0.479	0.279	0.092
perceived severity	0.309	0.958	0.642	0.107	0.388	0.306
Perceived benefits	0.081	0.140	0.429	0.976	0.978	0.222
Perceived barriers	0.430	0.245	0.799	0.159	0.923	0.152
Cues to action	0.272	0.292	0.833	0.496	0.194	0.786
Efficacy	0.336	0.270	0.354	0.321	0.484	0.295
Behavior	0.881	0.380	0.964	0.378	0.992	0.09

Table-2: Comparison of the mean DMFT scores according to gender

Variable	Status	N (%)	DMFT Mean ± SD	P-value
Gender	Female	175 (48.6)	2.55 ± 2.19	0.001
	Male	185 (51.4)	1.16 ± 2.18	

The mean score of health behaviors was 1.76 ± 4.85 in all samples and there was a significant difference between the two genders. The mean scores of perceived sensitivity, perceived severity, perceived benefits, and perceived barriers were not significantly different between the two genders. However, there was a significant difference between the two groups in terms of self-efficacy score and cues to action (P <0.05) (**Table 3**).

As presented in **Table 4**, there was a significant correlation between oral health behavior and perceived sensitivity, perceived severity, self-efficacy, perceived benefits, and cues to action. There was an indirect and significant relationship between perceived barriers and oral health behaviors. Considering the correlation coefficient, it can be argued that the cues to action and self-efficacy are more strongly correlated with the behavior, regardless of the direction of the relationship.

Table-3: Comparison of the mean scores of structures of the health belief model and oral health behavior based on gender

Variable	Female Mean ± SD	Male Mean ± SD	P-value
Perceived sensitivity	3.64 ± 0.735	3.53 ± 0.754	0.171
Perceived severity	4.13 ± 0.686	4.05 ± 0.646	0.241
Perceived benefits	4.38 ± 0.559	4.38 ± 0.509	0.978
Perceived barriers	2.51 ± 0.805	2.52 ± 0.851	0.912
Efficacy	4.18 ± 0.733	3.95 ± 0.831	0.006
Cues to action	3.59 ± 0.861	3.63 ± 0.932	0.013
Oral health behavior	1.75 ± 0.485	1.77 ± 0.486	0.662

4- DISCUSSION

The most important way to reduce tooth decay is to promote a culture of prevention in people. The first step is to identify the effective factors in this regard. Therefore, the present study aimed to determine the factors affecting oral health self-care behaviors in seventh-grade students in Behbahan, Iran, using the health belief model.

In the present study, the mean DMFT score of the participants was 2.08. Moreover, there was a significant difference in the DMFT scores between the two genders. It seems that the scores on this index have improved compared to the last decade, although they can be variable in different places and under the different education and training in each region.

In our study, the mean score of oral health behaviors was 1.75 in girls and 1.77 in boys. According to the results, the student's behavior in the field of oral health was not favorable based on the score range of answers related to the behavior (0-32). However, 18% of the samples do not brush their teeth at all, and 50% brush at least once a day. It is important to note that the brushing behavior should be modified rather it increases in terms of quantity (number of brushing times) and quality (correct brushing method).

In this study, 16.2% of the samples used dental floss daily. Considering the importance of flossing along with this low percentage of floss usage, manifests that improving this behavior requires specific interventions. Failure to floss among students may be related to a lack of knowledge and skills in this regard. Therefore, training on how to floss is necessary for parents, school health educators, and teachers. It is also suggested to root out the causes of low usage of floss in future studies, especially qualitative studies.

In this study, 25.8% of students referred to the dentist every 6 months. The low number of referring to the dentist in students can be because people only go to the dentist when they have pain. It seems that effective education is needed for parents and students about the need for regular visits to the dentist. It is also suggested to promote the culture of referring to the dentist and the regular referral through textbooks and other public media.

In our study, there was a significant relationship between perceived sensitivity and oral health behaviors. Some similar studies also reported this relationship to be significant (13, 14). Keikhaei et al., however, reported no significant relationship between perceived sensitivity and behavior (15). The present study was performed on teenagers who may not understand the seriousness of health situations and their vulnerability to tooth decay. Therefore, it is desirable to provide effective training for educators and parents to improve the students' attitudes about this behavior. It is necessary to strengthen this structure and modify it through appropriate solutions such as using videos along with highlighting the negative consequences based on the statistical evidence.

In the present study, there was a significant relationship between perceived severity and oral health behaviors. This finding was consistent with the study conducted by Mazaheri et al. (14); though, there was no such relationship in the studies by Moeini et al. and Keikhaei et al. (13, 15). The perceived intensity and severity should be increased by parents, school teachers and school health educators by the use of the appropriate educational methods.

Other findings of the present study showed a significant relationship between the

perceived benefits and behavior, which was consistent with the results of Mazaheri et al. (14). Moeini et al. did not confirm this relationship as being significant (13). The more students understand the benefits of oral health, the more they will engage in desirable behaviors.

In this study, perceived barriers showed a significant and indirect relationship with behavior. One of the important barriers to oral health is lack of time and fatigue, which can be adjusted by planning to use incentives, brainstorming, and discussion.

In the present study, self-efficacy was the most important predictor of oral health behaviors in students and had a significant relationship with desirable behavior. It means that improving self-efficacy leads to better oral health behaviors. This result was consistent with the findings of Moeini et al., Mazaheri et al., Shamsi et al. and Gharlipour et al. (13, 14, 16, 17). However, it was not consistent with Gargari and Hadadian's results, which is probably due to the different clients and age groups (18). Therefore, the level of oral health in students can be improved by proper training and education and also by strengthening the students' confidence in their ability to pursue oral health behaviors.

In this study, external support and encouragement (family, health educators, and friends), as well as internal motivation (fear of toothache), had positive roles in observing oral health behaviors. Cues to action such as the others' reminders, interpersonal interaction, and media communication are the accelerating forces making the student feel the need to perform oral health behaviors. Therefore, it is worth considering school health experts, parents, and friends as strong motivators to perform desirable oral health behaviors.

Among the limitations of the present study were the use of self-reporting tools with the possibility of making errors in completing the questionnaire, lack of objective observation on oral health behaviors, and the descriptive nature of the study.

5- CONCLUSION

To improve caries prevention behaviors, educational programs and interventions should be designed to strengthen perceived threat structures, perceived benefits, and self-efficacy while reducing the barriers to perform the behavior. Efforts should be made to increase self-efficacy and students' confidence to follow oral behaviors despite barriers. Therefore, it is recommended to use the health belief model as a framework for planning educational interventions to predict and improve students' oral health behaviors in school and at the community level. It is noteworthy that due to the high prevalence of caries in students, health measures should be taken at a younger age. Moreover, the parents' education must not be neglected in this regard.

6- ACKNOWLEDGMENTS

7- CONFLICT OF INTEREST None.

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