

Factors Affecting Oral-Dental Health in Children in the Viewpoints of Mothers Referred to the Health Centers in Qom City: Using the Health Belief Model

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Abstract

Background

Many dental problems such as tooth decay starts from childhood. In this regard, attitudes and beliefs of mothers about oral-dental health are important. The aim of this study was to determine the factors affecting oral-dental health in children of the mothers who referred to the Qom health centers by using of the Health Belief Model.

Materials and Methods

This is cross-sectional descriptive analytic study that was performed among mothers who had Children's health dossier in the Qom health centers, Iran. By using of multi-stage sampling and sample size formula, 300 mothers were selected randomly from health assessment centers. Required data from target group were collected by the questionnaire about Health Belief Model in the field of oral health. The data were analyzed using SPSS -20.

Results

The results showed that there was a positive and significant relationship between the mothers' behavior towards oral-dental health with perceived benefits and self-efficacy ($r=0.16$, $P<0.05$, $r=0.20$, $P<0.05$, respectively). Also, there was a negative and significant statistically relationship between the mother's behavior towards oral-dental health with perceived barriers ($r= -0.15$, $P<0.05$). In addition, there was a positive and significant relationship between mother's behavior toward the oral-dental health and the children's behavior towards this issue ($r=0.47$, $P<0.05$).

Conclusion

The findings is indicator of the importance of the usage of health belief model for assessing of the mothers' perceptions and beliefs about oral-dental health and modeling of their behavior for reinforcing of healthy behaviors in children.

Key Words: Child, Health Belief Model Health Education, Oral Health.

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1- INTRODUCTION

The oral-dental health in providing and promotion of public health is considered extensively, insofar as nowadays, it is known as one important slogan of the 21st century (1). The World Health Organization (WHO) considered the oral-dental health essential for a healthy life (2). Also, oral health has some impacts on children's health such as quality of life (3). Many problems of oral-dental health including tooth decay starts from childhood and can be prevented by early dental care (4).

The DMFT index has been widely utilized in epidemiological surveys of oral health. It is recommended by WHO for measuring and comparing the experience of dental caries in populations. The index expresses the mean number of decayed, missing and filled teeth in a group of individuals. The prevalence and severity of dental caries in the last 20 years in developing countries, including Iran, have shown a significant increase. This problem has been one of the most common diseases in children (5). The prevalence of early tooth decay in children less than 6 years of old in the entire of the world has been reported 6-90 percent (6). The results showed that Iranian children spend their third years of old and sixth years of old with about two and five decayed teeth, respectively (7).

Therefore, we can say that the oral-dental health related quality of life in children is closely related to his/her family (8, 9). From the reasons of tooth decay, it can be pointed out to the lack of enough information about oral-dental health, nonconformity of oral-dental health and failure to prevent oral disease, low socioeconomic status, low parental information, cultural habits and family education, continuous usage of sugary and sticky foods and beverage, fluorine shortage of drinking water and the use of harm substances for enamel; although, the habits, lifestyle and behaviors of the

people are highly effective in dental caries (10- 13). It must apply a variety of activities at the individual, occupational and social level for prevention of tooth decay. At the individual level, we must focus on behavioral factors that can improve oral health. Flossing and brushing of the teeth as behavioral factors have a deep and broad impact on the oral health, such that the daily use of them can improve the state of oral health by reducing plaque (14-16).

In order to properly plan for promotion of oral health in school-aged children, in the first we must evaluate the information, awareness and attitude of the mothers (including mother's level of education and culture, occupation, age, awareness, attitudes and current health behaviors and resources for obtaining of this information) in this fields. This could lead us to recognize the weaknesses and it affect indirectly on the children in addition to the improvement of the insight and habits of mothers with special emphasis (17). In this regard, mother's attitudes or perceptions of the mothers from oral health are important (18). Since the habits, lifestyle and behaviors are very effective in creation of dental caries, therefore, applying of models and theories of behavioral health education as a part of health planning is important (19).

Health Belief Model is from important models that shows the relationship between health beliefs and behavior. This model is based on the assumption that the beliefs of persons leads to the preventive behaviors. This model is focused on motivation, previous experience and as a whole on changes in beliefs. It is able to explain long-term and short-term health behaviors. It has perceived susceptibility (perceptions about the risk of suffering the disease), perceived severity (perceptions of the seriousness of the disease), perceived benefits (perceptions of the benefits of healthy behavior and health), perceived

barriers (the perceptions of barriers at work) (20), and perceived self-efficacy (belief to having the ability to perform normal behavior) (21). Although, several studies has been about the prevalence of dental caries in all of the world (22-24), but few studies have examined the oral health status based on the Health Belief Model structures (24), and the perceived self-efficacy with tooth decay (25). According to what was said above, and high rates of tooth decay in primary schools of the country (26), this study was performed by the aim of determination of factors affecting oral-dental health in children in the viewpoints of mothers referred to the health centers in Qom city by using the Health Belief Model.

2- MATERIALS AND METHODS

2-1. Study Design and Population

This is cross-sectional analytic study that was performed on the mothers who had health records for their children and referred to the Qom health centers, Iran.

2-2. Methods

Sampling in this study was multistage sampling, such that, in the first, urban areas were considered as a category. Then, the health centers in each of category (regions) were considered as a cluster. 300 samples were selected randomly by using of sample size formula from these centers.

2-3. Measuring tools

Data collecting tool in this study was the questionnaire related to the Health Belief Model that included demographic questions such as age, gender of children, age of mother, mother`s educational level, father`s educational level, mother`s job, father`s job, family income, insurance coverage with 9 questions; 12 multiple-choice questions about awareness of oral health status of children from 0-12 scores (for example: "What are the signs of dental caries?"), 6 questions about perceived

susceptibility in possibility for suffering of oral and dental diseases from 6-30 scores (for example: "In my opinion, tooth decay happens more in old age and my child will not suffer tooth decay."), 9 questions about the structure of perceived severity of oral and dental disease deterioration from 9-45 scores (for example: "In my opinion, tooth decay can cause tooth loss of my child."), 6 questions about the structure of perceived benefits for oral-dental health by brushing and flossing from 6-30 scores (for example: "I think, if my child brush his teeth at least two times a day, tooth decay can be prevented."), 10 questions about the structure of perceived barriers for oral-dental health like flossing and brushing from 10-50 scores (for example: "In my opinion, bleeding from gums causes that my child escape from brushing."), 4 questions about the structure of perceived self-efficacy for oral-dental health like flossing and brushing from 4-20 scores (for example: "I am sure my child can properly floss his/her teeth").

Each of the above-mentioned structures were in the Likert scale with a rating of 1 to 5 from strongly agree to strongly disagree. It is worth noting that to ensure the accuracy of the answers; some questions were formulated in reverse form. The behaviors related to the oral-dental health (brushing and flossing) of mother and child were designed with 12 multiple choices questions. (for example: "How many times a day does your child brush his/her teeth?"). It should be noted for the designing of the questionnaire, it was used from conducted studies by Shamsi et al. (27) and Hazavei et al. (19). The reliability of used tool for the structures of awareness, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, perceived self-efficacy and behaviors toward the oral-dental health was calculated 0.89, 0.70, 0.85, 0.89, 0.73, 0.88 and 0.75, respectively by Cronbach's alpha test. For assessing the

validity of tool, it was used from expert's panel opinions.

2-4. Inclusion criteria

The inclusion criteria were consisted of mothers who had health records for their children and being satisfied to participate in the study.

2-5. Exclusion criteria

The exclusion criteria were just partial completing of the questionnaire and unwillingness to participate in current study.

2-6. Ethical considerations

Before completing the questionnaire, the aim of the study was presented for the participants and the informed consent was obtained from them.

2-7. Data analyses

The data were analyzed using SPSS software version-20 by independent t-test for relationship between gender of children with DMFT index, ANOVA for relationship between parent's educational level, parent's job and family income with DMFT index, and Pearson correlation coefficient for correlation between health belief model's structures with mother's and children's behaviors at the significant level 0.05.

3- RESULTS

The results showed that the mean and standard deviation (SD) of the age of mothers and children were 33 ± 5.45 years and 5.84 ± 0.40 years old, respectively. 30.7 percent of mother had high school graduates and 3.7 percent of them were illiterate, also 90.7 percent of mothers were housewives. The coverage of health insurance of under-studied families was 81.3 percent. The mean and standard deviation of Decayed teeth, Missing teeth and Filled teeth were 4.85 ± 3.37 , 0.29 ± 0.73 and 0.35 ± 1.03 , respectively. Totally, the mean and standard deviation of DMFT

index in children was 5.49 ± 3.60 . Results showed that 97.3 percent of children hadn't inflamed gums. According to the results presented in **Table.1**, 0.7 percent of mothers and also 7 percent of children did not brushed their teeth. 11 percent of mothers and 3.7 percent of their children brushed their teeth for three or more times per a day. Also, the findings showed that 20 percent of mothers and 48.7 percent of children didn't use dental floss in one day, and only 4 percent of mothers and 0.3 percent of children used dental floss for three or more times in one day (**Table-2**).

According to the results of **Table.3**, there was a significant relationship between the mean score of DMFT index of children with parent's educational level, mother's job, family income, and gender of children. So that, mean score of DMFT index was higher in the illiterate parents, housewife mothers and poor family income than others. Also, the mean score of DMFT index was higher in girls than boys. While there was no significant relationship between DMFT index of children with father's job ($P=0.309$).

According to the **Table.4**, the findings showed that there was a positive and significant relationship between oral-dental health behavior with perceived benefits and perceived self-efficacy ($r=0.16$, $P=0.005$, $r=0.20$ and $P<0.001$, respectively). So that, oral dental health behavior was increased with the increase of perceived benefits and perceived self-efficacy. Also, there was a negative and significant relationship between oral-dental health behavior with perceived barriers ($r= -0.15$, $P=0.01$). So that, oral dental health behavior was increased with the decrease of perceived barriers. There was a significant and positive relationship between oral-dental health with perceived benefits ($r=0.13$, $P=0.02$), perceived self-efficacy ($r=0.25$, $P<0.001$) and mother's behaviors ($r=0.47$, $P<0.001$). While, there was a negative and significant relationship

between child's behaviors toward oral-dental health with perceived barriers ($r=-0.21$, $P<0.001$). Also, there was a negative and significant relationship between

DMFT index and perceived severity ($r=-0.14$, $P=0.01$). So that, DMFT index was increased with the decrease of perceived severity.

Table-1: Frequency and percentage of the mother's and children's behaviors toward brushing the teeth (in one day)

Variables		Frequency	Percentage
Mother's behaviors toward brushing	Never	2	0.7
	Once	159	53
	Twice	106	35.3
	Three times or more	33	11
Children's behaviors toward brushing	Never	21	7
	Once	187	62.3
	Twice	77	25.7
	Three times or more	11	3.7

Table-2: The frequency and percentage of mother's and children's behavior toward using dental floss (in one day)

Variables		Frequency	Percentage
Mother's behaviors toward flossing	Never	60	20
	Sometimes	147	49
	Once	54	18
	Twice	26	8.7
	Three times or more	12	4
Children's behaviors toward flossing	Never	146	48.7
	Sometimes	105	35
	Once	39	13
	Twice	8	2.7
	Three times or more	1	0.3

Table-3: The relationship between DMFT index in children with parent's educational level, parent's job, family income and gender of children

Variables		DMFT score (mean \pm SD)	P-value
Mother's educational level			
	Illiterate	7.36 \pm 2.33	0.037
	Primary school	5.87 \pm 3.76	
	Secondary school	5.97 \pm 3.88	
	Diploma	5.05 \pm 3.45	
	College education	4.45 \pm 3.07	
Father's educational level			
	Illiterate	7.55 \pm 3.04	0.04
	Primary school	6.14 \pm 3.46	
	Secondary school	5.44 \pm 4.18	
	Diploma	5.11 \pm 3.12	
	College education	4.68 \pm 3.40	
Father's job			
	Unemployed	5.62 \pm 3.33	0.309
	Self employed	5.64 \pm 3.86	
	Laborer	5.85 \pm 3.55	
	Employee	5.28 \pm 2.99	
	Retired	3.50 \pm 3.10	
	Others	4.26 \pm 3.31	

Mather`s job			
	Housewives	5.65±3.63	0.014
	Self employed	6.80±3.27	
	Employee	3.33±2.32	
	Others	2.80±2.68	
Family income			
	Good	3.59±2.69	0.021
	Mediocre	5.34±3.58	
	Poor	6.25±3.71	
Gender of children			
	Boy	5.01±3.54	0.007
	Girl	6.15±3.59	

Table-4: The relationship between health belief model`s structures and mother`s and children`s behaviors toward oral-dental health and children`s DMFT index

Variables	Awareness	Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barriers	Perceived self-efficacy	Mother`s behavior	Child`s behavior	DMFT
Awareness	1								
Perceived susceptibility	p<0.001 r=0.29	1							
Perceived severity	p=0.001 r=0.19	p<0.001 r=0.43	1						
Perceived benefits	p=0.26 r=0.06	p=0.04 r=0.12	p<0.001 r=0.36	1					
Perceived barriers	p=0.76 r=0.01	p=0.61 r=-0.03	p=0.35 r=0.05	p=0.82 r=-0.01	1				
Perceived self-efficacy	p=0.93 r=-0.005	p=0.01 r=-0.14	p=0.51 r=0.03	p<0.001 r=0.23	p<0.001 r=-0.35	1			
Mother`s behavior	p=0.19 r=0.07	p=0.15 r=0.08	p=0.06 r=0.10	p=0.005 r=0.16	p=0.01 r=-0.15	p<0.001 r=0.20	1		
Child`s behavior	p=0.08 r=-0.09	p=0.10 r=-0.09	p=0.31 r=0.06	p=0.02 r=0.13	p<0.001 r=-0.21	p<0.001 r=0.25	p<0.001 r=0.47	1	
DMFT	p=0.24 r=-0.06	p=0.65 r=-0.02	p=0.01 r=-0.14	p=0.06 r=-0.10	p=0.46 r=-0.04	p=0.60 r=0.03	p=0.20 r=-0.07	p=0.43 r=-0.04	1

4- DISCUSSION

In this study, the structures of Health Belief Model as a determinant and the factors related to the mother`s perception and behaviors related to their child`s oral-dental health and also the DMFT index of the children had high efficacy.

This issue is indication of the importance of the usage of this model for strengthening the healthy behaviors, identifying of behavioral beliefs and removing the barriers for preventing of oral and dental problems.

In this study, the mean of DMFT index was higher than standard. This reflects the lack of oral health practices such as brushing and flossing constantly. In this regard, in the studies of Arsang et al. (28) and Shooriabi et al. (29), the mean of DMFT index have been reported high. Although, this index was lower than the index obtained in the studies in Saudi Arabia (30) and the Philippines (31); but it is higher than many countries, such that the mean of DMFT index in North Africa and Central Asia regions (MENA), Sub-Saharan Africa (SSA), Argentina and Nepal have been reported 3, 2, 4.64 and

3.7, respectively (32-34). It seems that this difference could be due to the differences in socio-economic status, public health care, awareness and literacy, health care insurance and etc. In any case, this amount of DMFT at older ages may lead the oral and dental status to the critical condition.

In this study, a significant relationship between children's DMFT index and child's gender was found; such that the mean of DMFT index scores in the girls was more than boys. In this regard, there was a significant relationship between DMFT index and dental plaque in the female and male students in Hazaveii et al. study; such that this index was more in the females than males (19).

Also, in the Basir et al. study, the prevalence of dental caries was reported more in the females than males (35). While, the prevalence of decay in boys was more than girls in the Hemmatyar and Masnavi (36), Loyola-pontigo et al. (37), Casanova-Rosado et al. (38) and Mantonanaki et al. (39) studies. There was not any difference in DMFT index between girls and boys in Ajami and Ebrahimi (40), Noorelahian and Afshari (41). Although, women and girls are more sensitive to health issues and they pay more attention to oral-dental health as a factor for enhancing the beauty. But this index can be changed in different places and different parent's and children's training. In the present study, there was a significant relationship between DMFT index of children with parent's educational level and family income. This finding can be explained in this way that the mothers with higher educational level have more knowledge about dental problems. Therefore, they have more positive role in their children's oral-dental health. This issue is more consistent with the results of other studies that show the impact of socioeconomic status on health behaviors (42, 43); such that, in Shamsi et al., the highest DMFT index was at low

socioeconomic status. Also, the decay rate was higher in mothers with low educational level (44). It can be assumed that education is a way to obtain information and it increase awareness about health that this issue provides the opportunity for modifying of improper healthy behaviors and improves the performance of dental health. This reflects the social and economic differences in accessing to oral health care facilities. Families with higher incomes are more likely to think their children's oral health and also they visit the dentist for more times. Usually, there is a positive relationship between literacy with higher incomes. These two factors together could increase the families' ability to provide oral health care and dental care for their children. In this regard, the results of the study of Mohtadinia et al. also confirm this issue (45).

From this issue inferred that the knowledge of working mothers is more than housewives and it has been effective on children's oral health. While, there wasn't any significant relationship between children's DMFT index and father's job. The results of present study are consistent with the study of Khan and Cleaton-Jones that was performed in children with 3-5 years old in South Africa (46). The findings of present study showed that only 11 percent of mothers and 7.3 percent of children brushes their teeth for three or more times in a day. In addition, one fifth of mothers and nearly one half of children didn't use floss during the day. In this regard, in Shamsi et al. study, 43.4 percent of mothers brushed their teeth once a day and 41 percent of them didn't use floss (44). The study of Emami Moghadam et al. showed that 47.5 percent of mothers brush their teeth in some days and 47.5 percent of them also use dental floss once a week (47). Also, the study of Mazloomi Mahmoodabad and Rohani Tonekaboni showed that 27.5 percent of students brush

their teeth more than once a day and 37.5 percent of them use dental floss (48). In Karami et al. study, 51.7 percent of students in fifth grade of elementary school had used from dental floss and 37.1 percent of them had brush their teeth at least once a day (49). In addition, in the study of Peker and Alkurt in Turkey, 32.1 percent of the students were used from dental floss (50). In Ostberg study, that was performed in the Swedish adolescents, 52 percent of teens had used from dental floss (51). With this condition, the prevalence of tooth decay and also the diseases related to the mouth and tooth is high in Iranian students and the use of interdental cleaners is low (52). Therefore, the oral health behaviors (brushing and flossing) must increase by training, quantitatively and qualitatively.

In this study, there was a significant and positive relationship between the mothers' behavior towards oral-dental health and perceived self-efficacy and perceived benefits; but, there was a significant and negative relationship between the mothers' behavior towards oral-dental health and perceived barriers. In this regard, in the study of Shamsi et al., there was a direct and significant relationship between oral health behavior of mothers with perceived sensitivity, perceived severity, perceived benefits and perceived self-efficacy; while, there was observed a significant and negative relationship between mothers' behavior towards oral-dental health with perceived barriers (44). Also, the results of the studies of Bahmanpour et al. (53), Broudbent et al. (54), MorovatiSharifabad and KarimzadehShirazi (55) are consistent with these findings. It seems that for improving of mothers' oral health behaviors must be designed educational program about oral-dental health and strategies for reducing the obstacles. Also, in this study was found a significant and positive relationship between child's behaviors toward oral-dental health with

perceived benefits and self-efficacy and it was found a significant negative relationship between child's behavior toward oral-dental health and perceived barriers. In this regard, there was found a significant negative relationship between perceived barriers and student's behaviors toward oral-dental health in the study of Solhi et al. (56). While in the study of Kuhner and Paetzke was not found relationship between perceived barriers and oral-dental health (57). Charkazi et al. showed that except for perceived barriers, all constructs of HBM were positively related to oral health behaviors (58). The results of the study of Pine et al. had shown that parent's beliefs has been effective in the possibility of children's tooth brushing for at least 2 times a day (59). Since many healthy behaviors, including oral health (brushing and flossing) is taught from an early age and takes shape, therefore, the mass media, families, schools and other relevant institutions must provide the necessary training for children.

In this study was observed a significant positive relationship between mothers' behavior and children's behaviors toward oral-dental health. In this regard, the results of Poutanen et al. (60) were consistent with the results of the present study. Also, the Saied-Moallemi et al. showed that the children of mothers who have higher oral health, have less tooth decay (61). Soltani et al. found that the children oral hygiene behavior was significantly and positively associated with maternal self-efficacy and oral health-related knowledge. (62). Also, studies have showed that other aspects of child's healthy behavior and lifestyle such as fruit, breast feeding and, domestic accident are influenced by mother's self-efficacy (63,64). Bahmanpour et al. in the findings of their study reported that about 70 percent of the students introduce their mother as the greatest encourager for

doing of oral-dental health behaviors and 54.5 percent of the students know their mother as the model for doing oral healthy behaviors (53). It seems that the children learn and emulate from their mothers in doing of oral healthy behaviors. Therefore, the mothers must encourage and support their children by doing healthy behaviors.

4-1. Limitations of the study

In according to the variability in the demographic, economic, social, health conditions in the field of oral-dental health, the findings of this study cannot be generalized for other groups and populations. In addition, the use of self-report instruments in this study was due to the lack of observation for oral-dental health behaviors, descriptive form of the study, and lack of follow up the effect of the study in future that all of these items are the limitation of this study. In this regard, it is recommended that further studies are done about oral-dental health in the various demographic groups and by use of educational intervention by the method of behavioral model.

5. CONCLUSION

Improvement of children's oral-dental health status depends on raising awareness, modifying the beliefs and ideas of the mothers about the benefits of oral and dental health; although, the barriers in the way for doing oral health behavior should be eliminated. The mothers must provide the basis for doing of the oral-dental health behaviors as a model and encourager. In this field, the Health Belief Model must be employed as a framework for educational planning, forecasting and promotion of oral health behaviors in the children and families.

6- CONFLICT OF INTEREST

The authors had not any financial or personal relationships with other people or organizations during the study. So there was no conflict of interests in this article.

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