

Do Maternal Oral Health-Related Self-Efficacy and Knowledge Influence Oral Hygiene Behavior of their Children?

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Abstract

Background

This study aimed to assess the effects of maternal self-efficacy and oral health-related knowledge on pre-school children oral hygiene behavior.

Materials and Methods

This cross-sectional study was conducted on 301 mothers with children aged 2–6 years old randomly selection from health centers of Tabriz, Iran. Data were collected using self-report questionnaires including demographic characteristics, maternal self-efficacy, oral health-related knowledge, and children's oral hygiene behavior. Data were analyzed using SPSS 16 using one-way ANOVA, Independent samples t-test, and multiple linear regressions at 95% significant level.

Results

The mean age of children was 4.1(standard deviation [SD] =1.4; range: 2–6 years). The mean score (SD) of children oral hygiene behavior was 5.4 (1.9). The mean score (SD) of mothers knowledge and self-efficacy were 4.9 (1.8) and 46.6 (14.8), respectively. 44.2% (133/301) of mothers had low self-efficacy and 55.8% (168/301) high self-efficacy. The children oral hygiene behavior was significantly and positively associated with maternal self-efficacy ($r = 0.517$, $P < 0.001$) and oral health-related knowledge ($r = 0.363$, $P < 0.001$).

Conclusion

According to the results of this study, mothers' self-efficacy and knowledge was the strongest predictor of children oral hygiene behavior. So, educational interventions to improve maternal self-efficacy and knowledge may be beneficial for children oral health habits.

Key Words: Children, Oral health, Self-efficacy, Tooth brushing.

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1- INTRODUCTION

Early childhood caries (ECC) defined as dental caries of primary teeth in a child up to 71 months or younger (1), still remains a serious difficulty in both several developing and developed countries (2). In the range prevalence of ECC- from 6 to 90% - developed countries get the lower end, and developing countries get the middle to higher end (3). In Iran, the national oral health study showed that only 11% of the 6-year-old children were free from dental caries, and also in this age the decayed, missing, filled teeth (dmft) score, was 5 (4). Oral hygiene is a major public health problem (5) that has some impacts on children's health such as quality of life (6, 7), wellbeing, and development (8).

Also, caries in primary dentition is a risk factor to caries in permanent dentition (9). The dietary and oral health behavior had positive association with ECC (10). In a study by Sarumathi et al. it was revealed that oral hygiene practice and eating habits have been associated with dental caries prevalence in children (11). The American Academy of Pediatric Dentistry (AAPD) suggests that oral hygiene should start as soon as an infant's teeth erupt, and brushing twice daily is a part of recommendations (12). Also, oral hygiene begins and maintains during early childhood (9). Parents are responsible for their children's oral hygiene and mother's role is more significant (13). On the other side, oral health behaviors and conditions have been found to be related to psychosocial factors like self-efficacy (14). Self-efficacy is "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" (15). Studies show that self-efficacy is an important predictor of oral health behaviors such as brushing and flossing (16-18); also higher self-efficacy of mothers is strongly associated with children's brushing frequency (19, 20). Despite the importance of self-

efficacy in oral health behaviors such as tooth brushing, there is not relatively enough research on self-efficacy in oral health (21). This study aimed 1) to determine oral health-related knowledge and self-efficacy of mothers whose children aged 2–6 years, 2) to explore the effect of maternal self-efficacy and oral health-related knowledge on their children's oral hygiene behavior.

2- MATERIALS AND METHODS

2-1. Study design and procedures

The cross-sectional study was conducted in 2014. Study participants were 301 mothers with children aged 2–6 years old, referring to health centers of Tabriz city, East Azerbaijan province, Iran. The permission of the Ethics Committee of Isfahan University of Medical Sciences, Iran, was obtained. The purpose of the study was explained to participants, and a written consent was obtained from participants entered to the study voluntarily. The self-administered questionnaire was completed anonymously by mothers. Data were collected through questionnaires completed either self-administered or interview.

Questionnaires from illiterate mothers were completed through face-to-face interviews by trained health nurses. Multistage sampling method was used for sampling. According to socioeconomic status, the city was divided into 3 regions, and then 4 health centers were selected randomly from each region. Participants were randomly selected from each health center according to the proportion of children aged 2 - 6 years old. Finally 301 mother-child pairs were included from 12 health centers of Tabriz, Iran. The eligibility criteria for inclusion were mothers with children aged 2–6 years old, willing to participate in the study, and not suffering from special mental and emotional diseases based on maternal self-report and their medical profiles.

2-2. Measurements

The questionnaire was composed of four parts: demographic characteristics data (8-item), oral health knowledge (10-item), oral health self-efficacy (9-item), and child oral hygiene behavior (1-item).

Demographic characteristics data were maternal and child's age (in year), child gender, number of children, maternal occupation status, economic status (poor, average and good), and mother's educational level (illiterate, primary, secondary school, high school, diploma, and University).

Oral hygiene behavior includes child's tooth brushing frequency per week and was assessed through an open format item during the past 7 days by mother's self-report. "How many times were your child's teeth brushed by own or someone else during 7 days ago" (19, 22).

The oral health-related knowledge was assessed through 10 multiple choice items in which every correct answer was given the score 1 and incorrect or "do not know" answer was given a score of 0. Total maternal knowledge score ranged from 0 to 10 and the higher score indicated the higher oral health knowledge. The reliability has been tested in the previous study: Reliability was 0.71 determined by Cranach's alpha (23).

The oral health-related self-efficacy (OHSE) was assessed based on the previous instrument (20), developed by Finlayson et al. and the Cranach's alpha was 0.91. The OHSE consisted of nine items measuring mothers' ability to brush child's teeth under several different conditions, asking participants to indicate how confident they were that they can have their child's teeth brushed when they were depressed, anxious, under a lot of stress, feeling that they were too busy, tired and worried about other things in their life. For each item, participants rated their level of confidence on a 10 points

scale (1 = not at all confident, 10 = very confident). The possible score range was 9–90 categorized in two levels including low self-efficacy (9–45) and high self-efficacy (46–90). Higher scores indicate higher self-efficacy. The OHSE scale originally written in English, it was translated into Persian; therefore, we performed the translation and back translation process. The content validity was performed via expert panel of twelve academicians (four dental public health, two psychologists, four health education and two health care providers). The mean Content Validity Ratio (CVR) and Content Validity Index (CVI) were calculated 0.66 and 0.79 respectively. In this study, the Cranach's alpha for Persian version was 0.88 that indicates an acceptable internal consistency. The test-retest coefficient (15 days interval for 30 participants) was 0.86 ($P = 0.001$).

2.3. Data analyses

SPSS version 16 (SPSS, Inc., Chicago, IL, USA) statistical software was used to analyze the data. Descriptive statistics were performed to explore means \pm standard deviation (SD) for continuous variables and percentage (%) for categorical variables, respectively. One-way ANOVA test and independent samples t-test were used to compare oral health-related knowledge and self-efficacy score in groups of categorical variables. Pearson correlation coefficient was used to determine correlation between continuous variables and oral hygiene behavior. The simple and multiple linear Regression model were performed to evaluate the association between children's oral hygiene behavior with independent variables. For all tests, the significance level of α (P-value) was considered as 0.05.

3-RESULTS

The mean age of mothers was 30.9 (standard deviation [SD] = 5.1 years; range

= 19-45), and children 4.1 (SD =1.4 years; range: 2-6). 276 mothers (91.7%) were unemployed (housewives). According to the results, 22.3% of mothers had higher educational level and 1.3% was illiterate. Among children, 52.2% were boys and 47.7 % were girls (**Table.1**).

The mean of child’s oral hygiene behavior score was reported 5.4 (range: 0–9, SD = 1.9). The mean (SD) knowledge score of maternal was 4.9 (1.8), and the mean (SD) score of self-efficacy was 46.6 (14.8). According to the results, 44.2% of mothers (133/301) had low self-efficacy and 55.8% (168/301) of them had high self-efficacy.

Results showed that children’s oral hygiene behavior was significantly and positively associated with maternal

knowledge ($r = 0.363$, $P < 0.001$) and self-efficacy ($R = 0.517$, $P < 0.001$) (**Table.2**).

Based on results in (**Table.3**), the self-efficacy ($\beta=0.059$), knowledge ($\beta=0.233$), and child’s age ($\beta=0.39$) were the significant predicting factors for children’s oral hygiene behavior [$F (9,291) =19.9$; $P<0.001$; $R=0.618$].

Based on results in (**Table.4**), the self-efficacy of mothers was significantly associated with their educational level. Also, there is no significant relationship between maternal self-efficacy and her occupation status. On the other hand, maternal knowledge was statistically associated with her occupation status and education level ($P < 0.05$).

Table1: Socio-demographic characteristics of the samples, n=301

Variables	Catogores	n (%); Mean \pm SD
Child’s gender	Male	157 (52.2)
	Female	144 (47.7)
Maternal education	Illiterate	4 (1.3)
	Primary	23 (7.6)
	Middle school	35 (11.6)
	High school	27 (9)
	Diploma	145 (48.2)
Maternal occupation	University	67 (22.3)
	Employed	25 (8.3)
Economic status	Unemployed	276 (91.7)
	Low	79 (26.2)
	Mdium	173 (57.5)
Number of children	High	49(16.3)
	One	126(42.9)
	Two	144(47.8)
Age (yr)	Three or more	28(9.3)
	Children	4.1 \pm 1.4(2-6)
	Maternal	30.9 \pm 5.1(19-45)

Table 2: Pearson’s correlation coefficients between each of the continuous variables

Variables	Oral hygien		Self-efficacy		Knowledge		Mean (SD)
	P-value	r	P-value	r	P-value	r	
Oral hygien			0.001	0.517*	0.001	0.363*	5.4(1.9)
Self-efficacy					0.001	0.328*	46.6(14.8)
Knowledge							4.9(1.8)

*Correlation is significant at the 0.01 level (two-tailed); r= Correlation coefficient; SD: Standard deviation.

Table 3: Simple and multiple regression of predictor factors and children's oral hygien behavior

Model	Variables	Unstandardized coefficients		P-value	95% CI		Adjusted R ²
		B	SE		Lower Bound	Upper Bound	
1	Self-ficacy	0.072	0.007	<0.001	0.059	0.086	0.265
2	Knowledge	0.408	0.061	<0.001	0.28	0.52	0.129
3 [†]	Self-ficacy	0.059	0.007	<0.001	0.046	0.074	0.363
	Knowledge	0.233	0.06	<0.001	0.12	0.35	
	Child's age	0.39	0.071	<0.001	0.25	0.53	

Model.1: the simple regression: variable included in the model is Self-efficacy [F (1,299) =108, R=517, P<0.001]. **Model.2:** the simple linear regression: variable included in the model is Knowledge [F (1,299) =45.3, R=363, P<0.001].

† The multiple regression: demographic variables included in the model are age, education, economic status, number of children, occupation and marital status (Insignificant factors weren't shown in this table). SE: Standard error.

Table 4: Mean and SD of the scores of self-efficacy and knowledge with demographic characterise of subjects

Demographic characteristic	Self-efficacy		Knowledge	
	Mean ±SD	P-value	Mean± SD	P-value
Maternal education		<0.001 ^a		0.001 ^a
Illiterate	25±11.3		2.5±1.7	
Primary	35.5±13.7		3.4±1.6	
Middle school	43.2±12.1		4.2±1.7	
High school	45.9±13.4		4.4±1	
Diploma	48.4±14.3		5.2±1.7	
University	49.5 (15.6)		5.7 (1.2)	
Maternal occupation			0.630 ^t	
Employed	47.9±15		5.9±1.9	
Unemployed	46.4±14		4.8±1.8	
Number of children			0.116 ^a	
One	48.6±14.6		5.2±1.7	
Two	45.5±14.8		4.8±1.8	
Three or more	43±15.4		4.4±1.9	
Economic status		0.566 ^a		0.001 ^a
Poor	45.7±16.2		4.2±1.8	
Average	46.3±14.2		5.1±1.7	
Good	48.4±15		5.2±2	

Test applied: ^t independent samples t-test; ^a One-way analysis of variance (ANOVA); SD: Standard deviation.

4- DISCUSSION

This study was done to explore the impact of maternal self-efficacy and oral health-related knowledge on child oral hygiene. To our knowledge, this study is

one of the very few studies investigating the impact of maternal oral health related self-efficiency and knowledge on children's oral hygiene in Iran. According to the findings of this study, maternal self-efficiency and oral health-related

knowledge play important role in children's oral hygiene behavior. The present study showed that the mean score of children's oral hygiene behavior was 5.4 (SD=1.9). This showed a poor oral hygiene behavior among children. This finding is consistent with previous study conducted in Iran in which "once a day" oral-cleaning was reported 34% among 1-3 years old children (24). This finding contrasts with previous studies by Finlayson et al. and Trubey et al. reported a higher tooth brushing frequency in children (19, 22). In the Finlayson et al. study, the mean of children's brushing frequency was 8.4 among 1-3 years old and 9.7 among 4-5 years old per week (19). In the Trubey et al. study, the mean of weekly tooth brushing was reported 12.5 (22).

This study indicated that children's oral hygiene was significantly and positively associated with mothers' self-efficacy. This finding is consistent with several previous studies that found a significant association between mothers' self-efficacy and their children's tooth brushing practice (19, 20). In another study, it was found that there was a relationship between parental self-efficacy and frequency of both parent and child tooth brushing habit (14). Jamieson et al. found the low self-efficacy as a risk factor to poor oral health in pregnant aboriginal Australian women (21). Also, studies have showed that other aspects of child's healthy behavior and lifestyle such as fruit, vegetable intake, and, nourishing practices are influenced by mother's self-efficacy (25-27). In a qualitative study showed that maternal self-efficacy as an important barrier to breastfeeding among the nursing mothers (28). Maternal self-efficacy is the main precondition to enhance children oral hygiene. Therefore, improving maternal self-efficacy could lead to promotion of healthy dental habits among children (19). Hence, educational interventions based on

increasing self-efficacy could be helpful to improve preventive oral hygiene behavior among children.

Results of the Pearson's correlation coefficients of maternal self-efficacy, oral health knowledge and children's oral hygiene are shown in (Table.2). Mothers' oral health-related knowledge was positively correlated with children's oral hygiene behavior. This finding confirms other similar studies in this field (20, 29). Also, studies reported the positive effect of maternal knowledge on their children growth (30) and healthy behavior such as multivitamin and iron drops intake (31). Knowledge is a predisposing factor towards promoting healthy behaviors. Hence, health care providers should implement appropriate programs to increase maternal oral health-related knowledge.

In this study, oral health knowledge of employed mothers was significantly higher than oral health knowledge of unemployed (Housewife) mothers. This result supports previous study in this field (23). This study finding showed a significant difference between maternal oral health knowledge and education level. This finding confirms the findings of other studies that addressed the impact of mother's education on her oral health knowledge (23, 32). Hence, unemployed (Housewife) mothers and mothers with low education need to be in the priority group in the health promotion programs for children oral hygiene behavior.

4-1. Limitations of the study

There were some limitations in this study. *First*, the questionnaire was self-reported that could be a subject to recall bias. *Second*, this was a cross-sectional study; therefore, may not lead to casual inferences among maternal self-efficacy and children's oral hygiene. Despite of limitations, the findings of this study can provide some evidence to design effective

interventions on children oral hygiene behavior especially in health care settings.

5. CONCLUSION

According to the results of this study, both maternal self-efficacy and knowledge was the strongest predictor of children's oral hygiene. Hence, based on these two predictors, oral health promotion interventions seem necessary. The health providers need to improve maternal self-efficacy and knowledge regarding the importance of child oral hygiene behavior.

6- CONFLICT OF INTEREST: None.

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