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Original Article

The Effect of Educational Intervention on Oral Health-Related Self-Efficacy in Pregnant Mothers

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ABSTRACT

Attention to oral hygiene is of particular importance in vulnerable groups, including pregnant women. Since self-efficacy is a predictive factor for oral hygiene behaviors, this study aimed to determine the effect of an educational intervention on the level of self-efficacy associated with oral hygiene in pregnant mothers. In this quasi-experimental study, purposive sampling was used and the samples were randomly divided into two experimental and control groups. In this study, demographic information questionnaires and Oral Hygiene Self-efficacy Questionnaire were used. The intervention was implemented over one month in the form of four 60-minute educational sessions. One month later, information was collected again from both groups. Data were analyzed by SPSS version 23 and chi-square, paired t-tests, and independent t-tests. A significant increase was observed in the mean self-efficacy for flossing in the experimental group before and after the intervention (P = 0.03). The difference in self-efficacy for flossing between the experimental group and the control group was also significant after the intervention (P = 0.04). Total self-efficacy increased significantly in the experimental group after and before the intervention (P = 0.04) and between the experimental and control groups after the intervention (P = 0.04). According to the results, educational intervention can increase self-efficacy associated with oral hygiene in pregnant mothers, especially regarding flossing, and be effective in maintaining their oral health during pregnancy.

Keywords: Pregnant mothers, Oral health, Self-efficacy, Educational intervention

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Introduction

Oral hygiene is considered an integral factor of health and well-being [1-3] and, in addition to being an important factor influencing chronic systemic diseases such as diabetes, stroke, cardiovascular disease and heart failure, chronic kidney disease, obesity, and even some coagulation diseases, its observance is an important factor in the prevention and treatment of many diseases, especially periodontal diseases. Oral hygiene is the methods and activities by which the oral cavity remains healthy. These methods include brushing teeth, using mouthwash, flossing, and periodic check-ups of the oral cavity by a dentist [4, 5]. Paying attention to oral and dental hygiene is of particular importance in vulnerable groups, namely the elderly, children, addicts, and pregnant women, and in the meantime, observing it in pregnant mothers is doubly important to protect their health and that of the fetus, because pregnancy is accompanied by changes in the body and subsequently the mouth and teeth, which, if not properly and timely care is not taken, provide the basis for the development of oral and dental diseases [6-8].

Hormonal and nutritional changes are among the changes that create suitable conditions for the occurrence of gum diseases and tooth decay in pregnant mothers. Among the reasons for poor oral and dental hygiene in pregnant mothers is their inadequate health information. Some pregnant mothers have little knowledge of the correct method of oral health care. In this case, health personnel must change their perspective on oral health issues, and for this purpose, group training classes can be held and mothers' attitudes towards oral health tips during pregnancy can be changed [9, 10]. It should be noted that people who have higher self-efficacy usually show the best behavior changes [11, 12]. In addition, oral health behaviors are related to self-efficacy, which is a psychosocial factor [13]. Self-efficacy is an individual's personal belief in having control over health behaviors and is directly related to an individual's self-confidence to perform tasks. In many health belief models, self-efficacy has been proposed as an important and influential factor in health behaviors [4].

Educational interventions can affect self-efficacy in various cases. Studies have shown that self-efficacy is a predictive factor for oral health behaviors such as tooth brushing [14-16]. Despite the importance and impact of self-efficacy on these behaviors, few studies have been conducted in this field, especially on pregnant mothers as a vulnerable group [17], but it needs a fundamental review. Therefore, given the importance and role of self-efficacy in performing self-care behaviors such as maintaining oral health, this study was done to determine the impact of educational intervention on self-efficacy associated with oral health in pregnant mothers.

Materials and Methods

The present study was a quasi-experimental study and purposive sampling was performed. The samples were randomly divided into two groups using Random Allocation software into two groups: experimental and control. A total of 100 pregnant women who were between 12 and 28 weeks of pregnancy and willing to cooperate were studied. The inclusion criteria for the study included primiparous and pregnant mothers, having minimal literacy, not participating in educational classes related to oral and dental health, and having informed consent to participate in the study. The exclusion criteria for the study included employment in professions related to dentistry, having oral and dental diseases, and not participating in educational sessions. The dropout criteria also included termination of pregnancy, having complications during pregnancy during the study, and not having access to samples in the second stage of the study. The informed consent form was completed by the pregnant mothers and the participants were informed of the study objectives, educational content, and number of sessions.

The estimated sample size, considering the power of the test of 0.80, the confidence interval of 95%, the precision of 0.05, the sample dropout of 10%, and the effect of the educational methods in a similar study, was 50 people in each group. Participants in both groups completed the questionnaires before the start of the study. The intervention was implemented over one month in the form of four 60-minute educational sessions in the form of lectures, questions and answers, and practical demonstrations of how to use a toothbrush, dental floss, and mouthwash. One month later, during routine follow-up care, information was collected from both groups again through a post-test questionnaire. A training group was also formed with the participants in the study to establish communication and follow-up so that in case of in-person training, training could be provided virtually. After the end of the study, to comply with the principle of ethics in research and to appreciate the participation of the subjects in the control group, the content of the training program was also provided to this group.

The training included efficiency in brushing teeth, flossing teeth, keeping the mouth clean, and visiting the dentist. The training program was as follows: in four sessions, the aforementioned information was provided to the mothers, and the remaining sessions were spent practicing the correct methods of brushing teeth, flossing teeth, and using mouthwash correctly with the mothers. First, these activities were practically performed by the trainer in front of the mothers, and then the trainer asked the mothers to do these things independently and without his help. The control group also underwent routine training during pregnancy. One month after the training and during the follow-up care, the post-test questionnaire was completed by the pregnant mothers of both groups. **Table 1** demonstrates the content of the intervention training program in the target group.

Table 1. Content of the intervention-training program in the target group

Session	Objective	Training Content	Method Used	Program Duration	Presenter

One	Introduction and familiarization and statement of purpose, educational needs assessment	Getting to know pregnant mothers, stating the rules (attending class on time, not being absent, being active in class, forming a training group to establish communication and follow-up, recognizing the educational needs of mothers in how to care for their mouth and teeth)	Lecture; Questions and answers	One hour	Dentist and research team
Two	Oral and dental health, the importance and necessity of paying attention to it during pregnancy	Important and specific functions of teeth, the fundamental role in chewing, proper nutrition and general health, maintaining beauty, correct pronunciation of words, helping with mental and emotional health, etc.	Lecture, PowerPoint, and educational video	One hour	Dentist and research team
Three	Factors that cause tooth decay and the correct way to brush and floss	The need to pay attention to oral health during pregnancy, maintaining oral hygiene, factors affecting tooth decay, especially during pregnancy, appropriate consumption of sugary foods, and practicing the correct way to brush and floss in practice	PowerPoint and using a dental model or educational video	One hour	Dentist and research team
Four	Mouthwash, visiting the dentist	Education on regular visits to the dentist and dental checkups, timely prevention of the spread and progression of oral and dental diseases with emphasis on pregnancy, education, and use of appropriate mouthwash, toothpaste, and toothbrush	Lectures, educational videos, and practical demonstrations	One hour	Dentist and research team
Five	Re-practice	Practice proper brushing, flossing, and mouthwash use with mothers	Practice	One hour	Dentist and research team
Six	Conclusion	Practical exercise and conclusion, questions and answers, guidance for pregnant mothers to refer to the dentist if necessary	Questions and answers	One hour	Dentist and research team

In this study, the data collection tools included a demographic questionnaire (including age, education level, employment status, and gestational age) and the Oral Hygiene Self-efficacy Questionnaire. This questionnaire is based on the theoretical definition of self-efficacy, which refers to individuals' perceptions and attitudes about their abilities to perform a specific action or task [18]. This questionnaire includes 19 items associated with self-efficacy in brushing teeth, flossing teeth, and visiting the dentist (with a score range of 0-76). The items include statements about how confident the individual is in their ability to perform oral and dental care in difficult situations (when busy with work, when sleepy, angry, etc.). The reliability coefficient of this scale was 0.60 and at a significant level ($p < 0.01$). Due to its favorable validity and reliability, the Oral Hygiene Self-efficacy Questionnaire is considered a suitable tool for measuring self-efficacy in oral and dental hygiene behaviors [19]. In the present study, the Cronbach's alpha of the entire questionnaire was 0.087 and all domains were significant ($P < 0.01$).

The final analysis was performed on 100 people. The data were analyzed by SPSS version 23 software and descriptive statistical tests (frequency, percentage, and mean), chi-square, independent t-test, and paired t-test, and the significance level for all tests was considered less than 0.05.

Results and Discussion

The mean age of mothers in the experimental group was 30.82 ± 5.30 and in the control group was 29.20 ± 4.96 years. Independent t-test did not show a significant difference in terms of age between the two groups ($P = 0.11$). In addition, the mean gestational age in the experimental group was 20.12 ± 5.92 and in the control group was 20.88 ± 5.40 weeks. Independent t-test did not show a significant difference in terms of gestational age between the two groups ($P = 0.50$). The majority of the samples in the experimental group were

housewives, 41 (82%) and 39 (78%) in the control group. The level of education in the experimental group was 24 (48%) and 20 (40%) in the control group. The experimental and control groups did not have a significant difference in terms of education and occupation and were homogeneous (P > 0.05). According to the independent t-test, in general, no significant difference was observed in the variables related to oral and dental health in the two study groups **(Table 2)**.

Table 2. Comparison of the average variables related to oral health in the two study groups

Variable	Group	Mean ± Standard Deviation	Independent T-Test Result
Number of times you brush your teeth per day	Experimental group	2.48 ± 0.73	P = 0.053
	Control group	2.22 ± 0.58	
Number of times you floss per day	Experimental group	1.84 ± 0.88	P = 0.72
	Control group	1.90 ± 0.81	
Number of times you use mouthwash per week	Experimental group	1.24 ± 0.55	P = 0.10
	Control group	1.44 ± 0.64	
Intervals between visits to the dentist (months)	Experimental group	3.36 ± 0.80	P = 0.69
	Control group	3.42 ± 0.73	

A significant increase was observed in the mean self-efficacy for flossing in the pre-test and post-intervention groups (P = 0.03). The difference in self-efficacy for flossing in the test group and the control group also became significant after the intervention (P = 0.04). An increase was also observed in self-efficacy for brushing teeth and visiting the dentist, but it was not statistically significant. Total self-efficacy increased significantly in the pre-test and post-intervention groups (P = 0.04) and between the test and control groups (P = 0.04) **(Table 3)**.

Table 3. Comparison of mean oral self-efficacy variables in the experimental and control groups before and after intervention

Variable		Experimental Group (Mean ± SD)	Control Group (Mean ± SD)	Independent T-Test Result
Toothbrushing self-efficacy	Before intervention	16.68 ± 4.45	15.08 ± 5.19	P = 0.10
	After intervention	17.38 ± 4.64	15.80 ± 4.86	P = 0.10
	P-value	P = 0.16	P = 0.13	-
Flossing self-efficacy	Before intervention	11.26 ± 5.66	12.58 ± 6.42	P = 0.27
	After intervention	14.06 ± 5.79	11.64 ± 6.83	P = 0.04
	P-value	P = 0.03	P = 0.94	-
Dentist visit self-efficacy	Before intervention	14.26 ± 4.17	15.40 ± 6.30	P = 0.28
	After intervention	16.36 ± 4.61	15.28 ± 4.45	P = 0.54
	P-value	P = 0.82	P = 0.50	-
Total self-efficacy	Before intervention	41.00 ± 9.18	42.6 ± 13.83	P = 0.77
	After intervention	46.34 ± 10.10	41.2 ± 13.45	P = 0.04
	P-value	P = 0.04	P = 0.56	-

The results of this study indicated a significant increase in the self-efficacy of pregnant mothers in flossing after the intervention and a significant difference with the control group. Self-efficacy is an individual's belief in their ability to successfully perform a behavior and a basic need for behavior modification [18, 20]. Belief in an individual's ability to demonstrate a behavior increases their competence in demonstrating that behavior and prepares them [21].

An important method for promoting self-efficacy in preventive behaviors for dental caries is to master the demonstration of behaviors through repeated practice. Successful preventive dental interventions require behavior change as well as changes in individuals' cognitions about oral health so that they can be successful in maintaining oral health and understanding how to prevent oral diseases. In clinical situations, self-efficacy refers to an individual's perception of their abilities to perform the activities

needed to promote and maintain health. An individual who sees himself or herself as capable of performing oral health behaviors is more likely to perform that behavior. The consequences of high self-efficacy and improved oral health status encourage the individual to improve that behavior [22-24]. The results of this study showed that pregnant mothers attach importance to flossing and increasing self-efficacy in this area can improve their oral and dental health. This result is consistent with other studies [15, 25].

Self-efficacy for flossing is one of the factors predicting the health behavior of flossing, in other words, mothers who are confident in their ability to floss, and those who believe that if oral hygiene is not observed, they will suffer from bleeding gums and tooth decay and their mouth will be deformed, and those who think less about bleeding gums during flossing, such as pain, and obstacles, perform the health behavior of flossing more [26, 27].

The findings of this study revealed that the self-efficacy of pregnant mothers, especially in the test group, increased in toothbrushing after the intervention, but it was not significant. Perhaps, with a larger sample size, better results would have been obtained in this case [26-28]. Another influential factor in this regard could be changes in the physiological conditions of mothers and hormonal and physical changes that occur during this period, which can cause boredom and prevent pregnant mothers from observing oral and dental hygiene behavior appropriately. In addition, one of the major obstacles for pregnant mothers is the lack of sufficient time for this task [29, 30]. Lidon-Rochelle *et al*. reported in a study that 58 women did not perform oral and dental care, including brushing their teeth, during pregnancy, and this rate was higher in women with lower income and without health insurance coverage [31]. Keirse and Plutzer stated in their study that only 35% of mothers performed oral and dental care during pregnancy and 41% of them experienced gum disease during pregnancy, which was related to their level of understanding of oral and dental care [32]. In the field of dentistry, self-efficacy for oral hygiene was significantly associated with the frequency of brushing and flossing and significantly promoted these behaviors [17].

The results of this study on self-efficacy for visiting the dentist showed that it increased after the intervention but was not statistically significant. The lack of oral self-efficacy, especially in brushing and not visiting the dentist, may be related to some false beliefs among pregnant mothers, such as the negative impact of dental services on fetal health during pregnancy or the genetic nature of tooth decay [29, 30]. Therefore, it is necessary for healthcare providers to increase the awareness of mothers and eliminate their misconceptions by providing timely consultation and examinations by dentists, and to increase the self-efficacy of pregnant mothers and adopt appropriate preventive behaviors.

Conclusion

Since self-efficacy is a predictive factor for oral hygiene behaviors, this study aimed to determine the impact of an educational intervention on the level of self-efficacy associated with oral hygiene in pregnant mothers. A significant increase was observed in the mean self-efficacy for flossing in the experimental group before and after the intervention. The difference in self-efficacy for flossing between the experimental group and the control group was also significant after the intervention. Total self-efficacy increased significantly in the experimental group after and before the intervention and between the experimental and control groups after the intervention. According to the results, educational intervention can increase self-efficacy associated with oral hygiene in pregnant mothers, especially regarding flossing, and be effective in maintaining their oral health during pregnancy.

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