

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_784_19

Role of self-efficacy, outcome expectation, and outcome expectancy in promoting oral health behaviors in adolescent girls

Masoumeh Alidosti, Elahe Tavassoli¹

Abstract:

INTRODUCTION: Oral health is a very important issue for different groups, especially adolescents. Social cognitive theory seeks to describe and promote people's health behaviors in a variety of ways. The aim of this study was to determine the role of self-efficacy, outcome expectation, and outcome expectancy in promoting oral health behaviors in adolescent girls in Shahrekord.

METHODS: The present study was performed as an intervention in junior high schools in Shahrekord (school year: 2018–2019). Using cluster sampling method, a total of eighty adolescent girls studying in Shahrekord public schools were selected and randomly divided into two groups of intervention and control. A researcher-made questionnaire was used to collect data on demographic variables, outcome expectation, and outcome expectancy constructs. In addition, a checklist was used to assess the status of oral health among the participants. Education for the experimental group was held in four sessions, each lasting 50–60 min. The data required for the study were collected in three stages: before the intervention, immediately after, and 2 months after the intervention. Using SPSS statistical software version 18, the collected data were analyzed through paired *t*-test and analysis of variance via repeating the observations.

RESULTS: There was no significant difference between the two groups in terms of demographic variables. Before the intervention, there was no significant difference between the two groups in terms of the mean scores of outcome expectation, outcome expectancy, and self-efficacy; however, after the intervention, there was an increase in the scores of the experimental group ($P < 0.001$). Two months after training, there was also a significant increase in the mean score of oral health behavior in the experimental group ($P < 0.001$).

CONCLUSION: Training based on perceived self-efficacy, outcome expectation, and outcome expectancy played an important role in creating the desired attitude toward oral health-promoting behavior among students.

Keywords:

Adolescent, oral health, outcome expectancy, outcome expectation, perceived self-efficacy

Department of Public Health, Behbahan Faculty of Medical Sciences, Behbahan, ¹Department of Public Health, School of Health, Shahrekord University of Medical Sciences, Shahrekord, Iran

Address for correspondence:

Dr. Elahe Tavassoli, Department of Public Health, School of Health, Shahrekord University of Medical Sciences, Shahrekord, Iran.
E-mail: tavassoli.eb@gmail.com

Received: 31-12-2019
Accepted: 30-05-2020
Published: 28-09-2020

Introduction

Oral health is an important branch of public health that has a significant impact on people's health.^[1,2] Failure to follow oral health practices can affect nutrition, speech, and the quality of sound and speaking. Therefore, it is one of the main

programs of the World Health Organization in the field of chronic diseases prevention and health promotion.^[3]

Ignoring oral health not only affects oral health, but also leads to tooth loss.^[4] Oral health can greatly affect the performance of children in school age and their status in future. Annually, more than 50 million

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Alidosti M, Tavassoli E. Role of self-efficacy, outcome expectation, and outcome expectancy in promoting oral health behaviors in adolescent girls. *J Edu Health Promot* 2020;9:254.

school hours are lost due to oral health problems.^[5] Oral diseases and problems usually begin in adolescence, however, observing oral health during this period of age can significantly help to reduce all kinds of diseases.^[5,6]

Using a toothbrush and floss is the easiest and most effective way to reduce dental plaque, tooth decay, and tooth loss.^[7] Enabling people to use toothbrushes and floss correctly is the best approach to encourage people to practice oral health practices.^[7,8] According to studies, 6% to 30% of adolescents in the Eastern Mediterranean Region brush twice a day.^[9] In Iran, only 44% of adolescents brush their teeth once a day.^[9] In order to improve oral health-related behaviors effectively, it is necessary to have a thorough understanding of people's decisions about the use of toothbrush.^[10] This need will be met only through using an efficient theory to identify factors mediating behaviors related to oral health.^[7,10]

The use of effective educational models and theories is one of the basic strategies for making a change in the educational system, improving the status of oral health in the community, and designing and implementing targeted effective and preventive educational programs in the community on the basis of a health education and health promotion.^[7] Social cognitive theory is one of the important theories in this field.

Social cognitive theory is based on the assumption that behavior is formed through continuous interaction between individual and environmental factors. This interaction is called reciprocal determinism; the interaction between the studied behavior and individual and environmental factors provides a useful framework for understanding health behavior.^[11]

Outcome expectation is the prediction of the possible consequences of practicing oral health behaviors,^[12] and outcome expectancy refers to the value of the consequences of a behavior from the perspective of an individual. The higher these values are, the more likely people are to engage in the desired behavior.^[13] At present, self-efficacy is widely used in a variety of health topics; for example, research has shown that self-efficacy is associated with the ability to control pain.^[14] On the other hand, self-efficacy is an important predictor of different health behaviors, including brushing and flossing.^[8]

Social cognitive theory highlights the important factors effective in predicting a behavior; it introduces the constructs of outcome expectation, outcome expectancy, and self-efficacy as the most important determinants and important principles in the design and implementation of educational interventions.^[15] Given the importance of oral health and the need to pay attention to adolescent girls' health, the present study was conducted to

determine the role of self-efficacy, outcome expectation, and outcome expectancy in promoting oral health behaviors of adolescent girls in Shahrekord.

Methods

The present intervention study was conducted on female students in junior high schools in the school year of 2018–2019. Considering a confidence interval of 95% and a test power of 80%, the sample size was calculated to be 80, with forty individuals in each of the experimental and control groups. The inclusion criterion for entering the study was the full and informed consent of the students, which was obtained in a written form. The female students in junior high school provided a specific address and telephone number for further follow-up. The exclusion criteria were the students' reluctance to participate in the study at any stage of the research, absence, changing school, and illness.

The participants were selected via cluster sampling method. First, the researcher referred to the education organization of the province, and after receiving the letter of introduction, she referred to the two educational zones of Shahrekord and obtained the list of junior high schools. Taking into account the desired number of samples and the number of high school students in each school, two public high schools were randomly selected.

After entering the schools, the researcher first talked to the school principals about the subject of the study and its objectives. Then, the researcher held a meeting with the teachers who were supposed to complete the questionnaires and perform educational interventions during their class hours. The subject and objectives of the study were presented to the students of the target group, and written consent was obtained from them. Without any compulsion, they were asked to cooperate with the researcher and complete the questionnaire with utmost care. The ethical code of the present study is IR.SKUMS.REC.1395.220.

The selected students were randomly divided into two groups. Then, the researcher-made questionnaire, whose validity and reliability were tested and approved, was given to the two groups. The data collection tool was a questionnaire with the following items. The demographic status of the participants was measured through assessing the variables of parents' age, occupation, and level of education. The construct of self-efficacy regarding oral health included five questions that were assessed using a 5-point Likert scale (completely disagree, disagree, no opinion, agree, and completely agree). The construct of outcome expectation regarding oral health included nine questions that were assessed using a 5-point Likert scale (completely disagree, disagree,

no opinion, agree, and completely agree). In addition, the construct of outcome expectancy included six questions that were assessed using a 5-point Likert scale (completely disagree, disagree, no opinion, agree, and completely agree). A checklist was also used to evaluate students' performance. It should be noted that in order to determine the face validity of the questionnaire, a complete list of compiled items was presented to a group of thirty female high school students, with demographic, economic, and social characteristics similar to those of the target groups of samples. This stage was performed in order to design a proper research tool and determine the score index and impact score of each item among a sample that was similar to the target group. Accordingly, five options including "completely important, important, moderately important, slightly important, and not important at all" were written in front of each item that were scored from 1 to 5 points, respectively.

In order to calculate the impact score, items with a score of more than 1.5 were selected as appropriate items and used in later stages. At this stage, the items were measured from the perspective of the target group in terms of difficulty level (difficulty in understanding words and phrases), the degree of irrelevancy (suitability and optimal relationship between phrases and the different dimensions of the questionnaire), and ambiguity (probability of misinterpretation of phrases or not understanding the meaning of words). The students' opinions were used to modify and correct the items in the questionnaire. In order to examine the content validity, the questionnaire was presented to five health education specialists. After applying the experts' opinions about the desired items, the content validity of the questionnaire was determined via calculating content validity ratio (CVR) and content validity index (CVI). In order to determine the CVR for the necessity or nonnecessity of each question, experts were consulted and CVR values above 0.56 were accepted, based on the Lawshe table.^[16] In order to determine the CVI, the criteria of relevance, clarity, and simplicity of each question were examined and values above 0.79 were accepted.^[17] Cronbach's alpha values obtained for each of the constructs were as follows: self-efficacy: 0.75, outcome expectation: 0.71, and outcome expectancy: 0.73.

Interventions were designed for the experimental group based on the constructs of social cognitive theory. The education intervention was performed in four sessions, each lasting 50–60 min: in the outcome expectation section, the benefits and expectations and results of oral health were discussed. In this session, using slides, the students were taught that oral health would lead to self-confidence in maintaining their health. They were also taught that maintaining oral health could prevent the problems caused by tooth decay and following

good oral health behaviors helps to feel better about preventing related illnesses. Attempts have been made to repeat the messages presented to students, as much as possible. During a group discussion, some of the students who regularly brushed their teeth and flossed spoke in support of the above-mentioned points, some of which are discussed below:

"I feel that my self-confidence has increased since the time I started to brush my teeth regularly." "I've been fresher and healthier since I started brushing regularly."

Concerning outcome expectancy section, the value and importance of each outcome were discussed. In this session, using slides, it was explained that health and its preservation are considered very valuable. The students were recommended to fully understand the value and importance of outcomes of behaviors preventing oral and dental problems. The students were taught that they need to pay much attention to their health because from different aspects, it is very important to have white and beautiful teeth. The students were said that although practicing some of the behaviors on a regular basis is time consuming, in case of maintaining oral health, they can be healthy, without having oral and dental problems; make more friends; be cheerful; always have a smile on their face; have more energy to study; do various activities; and feel a lower level of exhaustion. In the session related to self-efficacy, slides, educational pamphlets, and group discussions were used to teach the students how to increase self-efficacy and do desired activities. They were taught that they do not need to do it all at once, change their behaviors in a short period of time, brush their teeth regularly three times a day, floss regularly, or use mouthwash; rather, it is best to be patient and take small steps. They were asked to give themselves a small reward whenever they do a desired behavior, and use phrases such as Well done, you can, and from now on you are more beautiful and healthier.

The students were asked to draw a table on a piece of paper, and write down the obstacles to doing each of the behaviors in one column and write down the facilitators for each of the behaviors on the other side of the column. Each case was examined individually and solutions that could best neutralize the obstacles were written.

On the other hand, controlling emotions such as anger, pleasure, fear, and anxiety along with proper use of them is one of the important criteria for mental health. People who are able to identify and control their emotions have better reactions to events. This control will lead to success and positive experiences, and in turn will play a role in promoting self-efficacy. Hence, the students were asked to identify and select appropriate patterns for practicing the desired behaviors. For example, they were asked to

remember someone who uses toothbrush and dental floss regularly and always has healthy and fresh teeth and does not suffer from problems such as ugly teeth, toothaches, and other dental problems.

In order to motivate the students to observe the behaviors related to oral health, they were also asked to bring a toothbrush with them. At the beginning of the session, the necessary training was presented using the related educational videos. After watching the video, the students were asked to do the correct way of brushing and flossing in a practical way using the toothbrush they had brought with them and the dental floss that the researcher had provided each student. The students were given positive feedback if they did the right thing; however, if they had a problem with their behavior, the behavior was explained to them again, and then they were asked to repeat the behavior.

Immediately after the meetings held for the experimental group, the required data were collected from the experimental and control groups using a questionnaire. Two months later, follow-up was performed using the same questionnaire. After collecting data from the students, the data were analyzed in Statistical software package IBM SPSS version 18 (IBM, USA) (Statistical package for social science) using descriptive and analytical tests, including paired *t*-test and analysis of variance tests with repeated observations.

Results

The present study was conducted on eighty female high school students in Shahrekord, including forty in the experimental group and forty in the control group. Of all, 60% of fathers were self-employed and 90% of mothers were homemakers. In addition, 26% of fathers had a high school diploma, whereas the level of education of 35% of mothers was junior high school. There was no difference between the experimental and the control groups in terms of demographic variables ($P > 0.05$).

The repeated-measures ANOVA showed statistically significant difference between the mean scores of outcome expectation at different times (before, immediately, and 2 months after the intervention) in the experimental group ($P < 0.001$), but the scores in the control group

were not statistically significantly different at different times ($P > 0.05$).

The mean score at each time was higher than that in the preintervention stage, but based on the paired *t*-test of time in the experimental group, there was a significant difference in the score immediately after the test; in addition, there was a decrease in the mean score 2 months after the intervention, as compared with the previous stage ($P < 0.001$). The percentage of changes in the mean score of the outcome expectation immediately after the training, as compared with the time before the training, was 102.9% in the experimental group [Table 1].

The repeated-measures ANOVA showed statistically significant difference between the mean scores of outcome expectancy at different times (before, immediately, and 2 months after the intervention) in the experimental group ($P < 0.001$), but the scores in the control group were not statistically significantly different at different times ($P > 0.05$).

The mean score at each time was higher than that in the preintervention stage, but based on the paired *t*-test of time in the experimental group, there was a significant increase in the mean score immediately after the test, as compared with the time before the intervention ($P = 0.001$). The percentage of changes in the mean score of the outcome expectancy immediately after the training, as compared with the time before the training, was 87.4% in the experimental group [Table 2].

The repeated-measures ANOVA showed statistically significant difference between the mean scores of self-efficacy at different times (before, immediately, and 2 months after the intervention) in the experimental group ($P < 0.001$), but the scores in the control group were not statistically significantly different at different times ($P > 0.05$).

The mean score at each time was higher than that in the preintervention stage, but based on the paired *t*-test of time in the experimental group, there was a significant increase in the score of self-efficacy immediately after the test, as compared with the time before the intervention; in addition, there was a statistically significant decrease in the mean score 2 months after the intervention, as compared with the time immediately after the

Table 1: Comparison of the mean and standard deviation of the outcome expectation score regarding oral health before, immediately, and 2 months after the intervention in the experimental and control groups

Groups	Mean±SD			Level of significance of repeated measures ANOVA (<i>P</i>)
	Before	Immediately after	Two months after	
Experimental group	37.72±1.57	76.55±1.86	75.71±1.85	<0.001
Control group	36.88±1.52	37.47±1.65	36.43±1.73	0.189
Level of significance (<i>P</i>)	0.303	<0.001	<0.001	

SD=Standard deviation, ANOVA=Analysis of variance

test ($P < 0.001$). The percentage of changes in the mean score of the self-efficacy immediately after the training, as compared with the time before the training, was 56.9% in the experimental group [Table 3].

The results of paired t -test showed statistically significant differences between the mean scores of oral health behaviors at different times (before, immediately, and 2 months after the intervention) in the experimental group ($P < 0.001$), but the scores in the control group were not statistically significantly different ($P > 0.05$). The results of independent t -test showed no statistically significant difference between the experimental and control groups before the intervention ($P = 0.644$), while 2 months after the intervention, there were statistically significant differences between the two groups in terms of the mean scores ($P < 0.001$) [Table 4].

Discussion

The aim of this study was to determine the role of perceived self-efficacy, outcome expectation, and outcome expectancy in promoting oral health behaviors of adolescent girls in Shahrekord. Unfortunately, the prevalence of oral and dental problems among Iranian students is high, and the use of interdental cleaning devices is not much common among them.^[6] At the beginning of the study, 53.7% of the students reported the use of dental floss, while in Karami *et al.*'s study,^[6] 51.7% of the studied students reported the use of dental floss.

According to Ramezankhani *et al.*,^[18] only 21.9% of the studied people used dental floss daily, while Mazlumi *et al.*^[19] reported that 37.5% of the studied students used dental floss regularly.

In addition, in the present study, 40.3% of the students brushed at least once a day; this finding is in line with the results of other studies.^[6,18,20] Given the important role of toothbrush and floss in preventing oral and dental problems and consequently in preventing tooth loss and various problems and diseases of the mouth and gums, it is necessary to focus on increasing the quantity and quality of behaviors related to oral and dental health.^[20] The low prevalence of using toothbrushes and floss among the students can be attributed to their attitude toward the need to clean their teeth and interdental surfaces, or their inability to do so. Therefore, it seems necessary to design and implement targeted educational intervention with an appropriate approach.

The findings of the present study showed that students in the experimental group had a higher mean score of outcome expectation after the intervention. Outcome expectation is one of the predictable aspects of behavior. Outcome expectation in a personal factor, and in this study, it includes the following: prevention of tooth decay, reduction of bad breath, feeling good after brushing and flossing, less worry about tooth decay, and obtaining more energy and a more beautiful smile.

Table 2: Comparison of the mean and standard deviation of outcome expectancy scores regarding oral health before, immediately, and 2 months after the intervention in the experimental and control groups

Groups	Mean±SD			Level of significance of repeated measures ANOVA (P)
	Before	Immediately after	Two months after	
Experimental group	33.77±1.76	63.28±2.43	57.03±2.43	0.001
Control group	34.04±1.46	38.10±1.43	36.21±1.64	0.099
Level of significance (P)	0.945	<0.001	<0.001	

SD=Standard deviation, ANOVA=Analysis of variance

Table 3: Comparison of the mean and standard deviation of self-efficacy scores regarding oral health before, immediately, and 2 months after the intervention in the experimental and control groups

Groups	Mean±SD			Level of significance of repeated measures ANOVA (P)
	Before	Immediately after	Two months after	
Experimental group	35.33±1.95	55.43±2.94	54.30±2.01	<0.001
Control group	35.42±1.95	38.14±2.06	35.47±1.90	0.956
Level of significance (P)	0.742	<0.001	<0.001	

SD=Standard deviation, ANOVA=Analysis of variance

Table 4: Comparison of the mean and standard deviation of the scores of oral health behaviors before, immediately, and 2 months after the intervention in the experimental and control groups

Groups	Mean±SD		Level of significance of paired t -test (P)
	Before	Two months after	
Experimental group	46.31±1.98	67.31±2.11	<0.001
Control group	45.65±1.94	46.42±1.93	0.932
Level of significance (P)	0.644	<0.001	

SD=Standard deviation

The findings of the present study are consistent with the results of other studies.^[20,21]

The findings of the present study indicated that students in the experimental group scored higher on the outcome expectancy than those in the control group. Having more energy, being refreshed, not feeling tired, having a more beautiful smile, and most importantly being healthy and not getting sick are values that can be achieved as a result of behaviors such as brushing and flossing regularly.

Self-efficacy is the strongest construct in predicting changes in people's behavior.^[20,22] Students who achieved higher level of self-efficacy after the intervention had become successful in performing behaviors related to oral health. This finding is in line with the results of other studies.^[20,23]

Positive perceptions of learners about their ability to perform a desired behavior are effective in their encouragement. The feeling of competence and aptitude makes them practice desired behaviors more diligently and spend more time on their oral health behaviors. In the present study, students with lower level of self-efficacy made less effort to perform the desired behaviors because they thought that they could not perform these behaviors well, so we helped these students to accompany those with proper behaviors (students with higher level of self-efficacy). As a consequence, they also made more efforts to improve their self-efficacy and performed better behaviors related to oral health.

As one of the limitations of this study, the required data were collected via self-reports. Another limitation of the study was the short time of follow-up (2 months) after the interventions. In addition, this study was performed only in girls' high schools, so it is necessary to be cautious when generalizing the results. It is also necessary to conduct more extensive studies on different age and sex groups and spend more time to follow up the interventions, measure the sustainability of educations, provide model-based and purposeful education for school teachers, and involve the parents of students.

Conclusion

The findings of this study showed that implementing a theory-based training program was effective in promoting oral health behaviors. When adolescents have more positive expectations and higher level of expectancy and make more efforts to improve their ability to behave better, they are more likely to practice that behavior in a better and more perfect manner; as a result, they will engage more in oral health behaviors that will effectively prevent oral problems and diseases.

Acknowledgments

The authors would like to express their gratitude and appreciation to the Vice Chancellor for Research and Technology of Shahrekord University of Medical Sciences who helped to conduct this study (study approval code: 2717, code of ethics: IR.SKUMS.REC.1395.220) and all the students who helped us in the implementation of this project.

Financial support and sponsorship

This paper is the result a research project approved by the Research and Technology of Shahrekord University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest.

References

1. Mazloomi-Mahmoodabad S, Moein-Taghavi A, Barkhordari A, Alidoosti F. Effect of role modeling through theater show in oral health education. *J Islam Dent Assoc Iran* 2009;21:138-42.
2. Ayegh SH, Esfahani MN. Knowledge and attitudes of dental students at Universities across the Country to provide oral health services, and health care networks in the Nation. *J Daneshvar* 2007;15:53-6.
3. US. Department of Health and Human Services. *Health People 2010: Understanding and Improving Health*. Washington (Dc): US Government Printing Office (GPO); 2000.
4. Rahimi F, Shojaeezade D, Zeraati H, Akbarian M. Oral health care based on educational health belief model in child. *J Health* 2011;2:74-81.
5. Rahimzadeh A, Solaimani PF, Rahmani K, Bagheri S. Effect of a training intervention program designed based on health belief model on adopting behaviors preventing dental caries in students. *Iran J Health Educ Health Promot* 2018;6:266-76.
6. Karami K, Shakerinejad G, Kabiry B. Effect of education based on health belief model on students' oral health behavior change. *J Ilam Univ Med Sci* 2014;21:134-41.
7. Peyman N, Roudi KH. The effect of education based on the theory of planned behavior on caries prevention of permanent teeth in fifth grade students in Khaf City. *J Mashhad Dent Sch* 2015;39:123-36.
8. Buglar ME, White KM, Robinson NG. The role of self-efficacy in dental patients' brushing and flossing: Testing an extended health belief model. *Patient Educ Couns* 2010;78:269-72.
9. Sadeghi M, Bagherian A. DMFT index and bilateral dental caries occurrence among 12-year-old students in Rafsanjan-2007. *J Rafsanjan Univ Med Sci* 2008;7:267-74.
10. Hajiagha AP, Saffari M. Predictors of tooth brushing behavior in Iranian adolescents: An application of the planned behavior theory. *J Islam Dent Assoc Iran* 2012;24:159-64.
11. Najarkolaei FR, Jafari NJ, Jafari MR. The effectiveness of social cognitive theory (SCT) workshop educational intervention for HIV/AIDS risk reduction in non-medical University Students. *hrjbaq* 2016;1:95-103.
12. Saffari M, Shojaezade D, Ghofranipour F, Heydarnia A, Pakpour A. *Health Education and Promotion, Theories, Models and Methods*. 1st ed. Tehran: Sobhan; 2009. p. 100-12.
13. Sharma M, Roma JA. *Theoretical Foundation of Health Education and Health Promotion*. United States of America: Jones Bartlett Publishers; 2008.
14. Gargari RB, Hadadian NS. The role of self-efficacy and factors

- of health belief model in dental patients' brushing and flossing. *J Urmia Nurs Midwifery Fac* 2011;9:1-9.
15. Bashirian S, Jalily M, Shahanjarini AK, Soltanian A, Barati M. Effectiveness of educational program based on social cognitive theory constructs to promote nutritional behaviors among pregnant women in Tabriz. *Iran J Nutr Sci Food Technol* 2017;12:1-10.
 16. Lawshe CH. A quantitative approach to content validity. *Personnel Psych* 1975;28:563-75.
 17. Waltz CF, Bausell RB. *Nursing Research: Design, Statistics, and Computer Analysis*. Philadelphia: W.B. Saunders Co;1981. p. 45.
 18. Ramezankhani A, Mazaheri M, Dehdari T, Movahedi M. The relationship between HBM constructs with fifth grade students of dental caries in Dezful. *J Med* 2011;2:221-8.
 19. Mazloumi-Mahmoud AS, Rohani TN. Some of the factors related to oral health among secondary school students in the Health Belief Model in Yazd. *Birjand Uni Med Sci* 2007;3:40-8.
 20. Kabiry B, Shakerinejad GH, Karami KB, Angalli KA. The effect of training on students' oral and dental health behaviors and health belief model constructs. *Sadra Med Sci J* 2014;2:327-38.
 21. Fallahi A, Morowatisharifabad M, Haeriyani A, Lotfi MH. Survey stages of cleaning between tooth cleaning behavior of the trans theoretical model-based pre-University students in Yazd. *Tehran Univ Med Sci J* 2009;4:41-50.
 22. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev* 1977;84:191-215.
 23. Birang R, Shakerian K, Samani FY, Nadim M. Effects of education through video media in promoting oral health among students. *J Arak Univ Med Sci* 2006;2:1-6.