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The effect of educational intervention based on the theory of planned behavior and stages of change construct on women's physical activity

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Abstract:

BACKGROUND: Insufficient physical activity is a global health-care problem and is considered an independent risk factor for chronic diseases. The present research aimed to explore the effect of an educational intervention based on the theory of planned behavior (TPB) and stages of change on promoting women's physical activity.

MATERIALS AND METHODS: This quasi-experimental research was conducted on 68 women who voluntarily visited the health-care centers of Mashhad. They were selected by randomized multistratified sampling method and were divided into two groups of intervention ($n = 34$) and control ($n = 34$). The data collection tools included a demographic information questionnaire, a questionnaire based on the TPB and stages of change, and the International Physical Activity Questionnaire. The data were statistically analyzed by SPSS software version 16 using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (paired t -test, correlation coefficient, and covariance). The significance level of $P < 0.05$ was considered in this study.

RESULTS: No statistically significant difference was found between the intervention and control groups before the intervention in terms of the scores of the TPB constructs and physical activity ($P > 0.05$). However, after the educational intervention, a significant difference was observed in the mean scores of TPB constructs and physical activity ($P < 0.05$). In addition, no statistically significant difference was found in the stages of change between the two groups after the intervention.

CONCLUSIONS: The results of this study pointed to the effectiveness of educational intervention and the necessity to use educational interventions to help adopt preventive behaviors. Therefore, the use of well-established educational models rather than conventional methods is recommended.

Keywords:

Educational intervention, health candidate, physical activity, stages of change construct, theory of planned behavior

Introduction

Women are less physically active than men, and this difference is $>8\%$; in other words, this figure is 32% for men and 23% for women. In addition, 28% of adults are physically inactive.^[1,2] Lacking physical activity accounts for 10% – 16% of breast cancer, colon cancer, and diabetes cases,

and about 22% of ischemic heart diseases are caused by physical inactivity, which is considered a priority in health and disease control.^[3] Research has shown that one of the key factors affecting physical activity is the barriers involved in this behavior. However, the ability to overcome these barriers is significantly and positively correlated with physical activity.^[4] Physical activity helps

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in preventing coronary heart diseases and emotional fatigue.^[5] Physical activity lowers stress and increases energy level.^[6] Because the benefits and effects of physical activity on health are well known, and as people's lifestyle has changed tremendously due to mechanization of work, certain interventions are needed to maintain and promote health in the society.^[7] Hence, to promote healthy behaviors in the society, health candidates should learn health skills and recognize the value of educational programs. They should feel responsible in teaching their skills to at least fifty families.^[8] The main duties of these local agents include teaching health-related issues, educating families, and linking people to health-care centers to solve their health problems. Due to the expansion of urban life, provision of active and reliable health-care services is impossible without public participation. Today, in many countries, this great resource is used to promote the health of the society.^[8]

Many investigations have pointed out to the effectiveness of theory-based educational programs. As behavioral change is a complicated process, and many factors are involved in it, different theories and approaches have been proposed to investigate and see how behavior changes. One such approach is the theory of planned behavior (TPB) proposed initially in 1985 and extended in 1991 by Ajzen and Fishbein.^[9] This theory consists of several constructs including attitude, subjective norms, perceived behavioral control, and intention.^[10] The TPB works well with general health programs and health promotion, due to its emphasis on the social norms and their understanding.^[11]

The trans-theoretical model was proposed in the late 1970s by James Prochaska. A key construct within this model is the stages of change. According to this model, not all people are at the same stage of preparation and readiness for change.^[8,12] The stages of change model involve the aspects of time, which believe that changes occur through time. Before any change of behavior and acceptance of healthy behavior, people go through the following five stages: precontemplation, contemplation, preparation, action, and maintenance.^[10] Moreover, health candidates play a key role in communicating health information to families. Thus, the present research aimed to adopt the TPB and stages of change construct to promote physical activity among health candidates in Mashhad.

Materials and Methods

Research design and sampling

This was an interventional and quasi-experimental research. Its target population was female health candidates visiting the health-care centers of Mashhad, Iran.

To determine the sample size, 260 individuals were first entered into the study based on the formula and opinion of a statistical consultant. According to the stages of change model, only people who were at the stage of thinking and readiness were entered into the study. Thus, out of 260 people in the first stage, only 60 were at the stage of thinking and readiness. Finally, the sample size was considered to be 34 individuals for each group, taking into account a drop rate of 10%.

The randomized multistratified sampling method was used in this study. For this purpose, four health-care centers in Mashhad were selected randomly and then, two of them were assigned to the intervention group (each center with 17 participants), and the other two were assigned to the control group. This research lasted from January 2018 to September 2018.

Inclusion/exclusion criteria

Inclusion criteria in this study were having at least a year of work experience and no disability, giving consent for participation in the study, and having no special disease that could impede physical activities. Those who entered the study were at the contemplation or preparation stages (according to the stages of change model).

Exclusion criteria were unwillingness to take part in the study, occurrence of a problem or defect that could impede physical activity, absence for more than two training sessions, and incomplete filling of the pre-test or post-test questionnaires.

Instrumentation

The questionnaire used in the present research comprised of four sections. The first section included demographic information on nine items that explored age, body mass index (BMI), marital status, candidate's and spouse's education, and average monthly salary.

The second section measured the constructs of the TPB. To conduct this project, the questionnaire developed by Solhi *et al.* was used. Certain adaptations were made to the questionnaire after the reliability and validity checks. To measure the construct, the attitude, subjective norms, perceived behavioral control, and intention of samples were measured by questions 9, 5, 4, and 3, respectively.^[4] All questions in this section were rated on a 5-point Likert scale ranging from totally agree to totally disagree. The options of totally disagree, disagree, no comments, agree, and totally agree received the scores of 1, 2, 3, 4, and 5, respectively. The first two questions of the perceived behavioral control were scored reversely.

The third section of the questionnaire was related to the stages of change. The questions addressing these stages were derived from the standard questionnaire

developed by Marcus *et al.*^[13] that was in a 5-point Likert scale including stages of precontemplation (score 1), contemplation (score 2), preparation (score 3), action (score 4), and maintenance (score 5).

The fourth section in this questionnaire was, in fact, the International Physical Activity Questionnaire (the short form), which contained a number of questions about intense and moderate physical activities within the past week.^[14]

Reliability and validity

To check the content validity, the comments made by field specialists were considered. Overall, a content validity score of above 0.79 was considered as acceptable.^[15] The content validity scores of attitude, subjective norms, perceived behavioral control, intention, and stages of change were, respectively, estimated at 0.92, 0.87, 0.94, 0.93, and 0.90. Moreover, the content validity ratio of the same constructs mentioned above was estimated, respectively, at 0.71, 0.48, 0.75, 0.84, and 0.68. The reliability of the questionnaire was checked through a pilot test and Cronbach's alpha test as follows: attitude (0.90), subjective norms (0.96), perceived behavioral control (0.99), behavioral intention (0.88), and stages of change construct (0.96).

Intervention

The questionnaire was used in the two groups of intervention and control at the pretest. Then, in light of pretest results, an educational need analysis was done to determine the educational content and methods (educational package) and the number of sessions required for the education. The educational sessions for the intervention group were held in the classrooms situated in each of the urban health-care center or health bases over 1-month period. The educational content for each session was developed in accordance with the learners' understanding, use of credible scientific sources, and experts' comments on the constructs of TPB. Similarly, the target behavioral goals were taken into account along with the teaching methods as well as the number of sessions and the time needed for each session. Active learning was the basis of educational planning in this study. During the educational intervention, an attempt was made to make the health candidates actively involved in the educational program. The content was communicated to the candidates through oral and written lectures (lecture and pamphlet), brainstorming, practical presentation of physical exercises, and distribution of guidelines. Furthermore, a full DVD of the content was given to the participants at the end of each session for self-study. In this educational program, participants' age, education level, and the goals of the program were taken into account while using the audio-visual media such as PowerPoint presentation, instructional pamphlets,

posters, and leaflets along with relevant images. In this study, laptop computers were used to present the texts and images relevant to the educational goals. The educational content was presented in four theoretical sessions and one practical session, which took about 45–60 min.

The strategy of delivering the educational content during the sessions was based on the constructs of TPB, with more emphasis on the construct of perceived behavioral control. However, to achieve the overall goal of the study, which was to promote physical activity, an emphasis was also placed on the structures of attitude and subjective norms, which increased the intention and ultimately improved the physical activity. In the first session, in order to improve the attitude of health volunteers about physical activity, brainstorming and group discussion methods were used, and the positive outcomes of physical activity were discussed. Group discussion method was used because it is an interactive method that allows the exchange of thoughts and helps to create the right attitudes and values. It is also the best way to change the attitudes. During the brainstorming, participants were able to share their thoughts and perceived the consequences of physical activity. In the second session, to increase the subjective norms of the health volunteers with regard to physical activity, the training session was held with the families of health volunteers. Pamphlet and educational packages were presented to the families of the health volunteers, and emphasis was placed on the role and support of family and friends in undertaking physical activity. Group discussion and role play (which illustrated the behavior of significant others and importance of family status) were also used. The third and fourth sessions aimed at improving the level of perceived behavioral control of the health volunteers with regard to physical activity on a daily basis. At first, a list of conditions that may prevent physical activity in the health volunteers was provided, and strategies were presented by the health volunteers who participated in the meeting. To moderate the perceived behavioral control, a discussion was conducted on factors that facilitate behavior and incentives as well as how to reduce barriers and have role models for behavior. The intervention group received different methods of instructions. The final evaluation was done after 2 months.

Ethical considerations

The study on which the data analysis was based was approved by the Ethical Board Committee of Mashhad University of Medical Sciences (Reference number IR.MUMS.REC.1394.395). Once the official permissions were obtained from the deputy of research of the university, the ethical issues were taken into account such as the confidentiality of data, no instrumental use of

the results, mothers' consent, and willingness to take part in the research. Only then, the research was conducted. During the day shift, the researcher visited the targeted health-care centers; distributed the questionnaires; and provided the necessary explanations about the project, confidentiality of data, and justification for the research. Then, a written consent form was signed by the participating mothers. After the interventions, the required educational content was provided to the control group for ethical reasons.

Data analysis

For data analysis, the distribution of variables was checked for normality by Kolmogorov–Smirnov test. Then, descriptive statistics (frequency, mean, and standard deviation) were used for both groups. Inferential statistics were also used to compare the mean scores of variables between the two groups. To compare the pretest and posttest results for the normally distributed variables, the paired *t*-test was used and for those variables that were not normally distributed, Wilcoxon's test was used. The level of significance was set at $P < 0.05$.

Results

Before the intervention, independent *t*-test and Chi-square test were used to compare the intervention ($n = 34$) and control ($n = 34$) groups in terms of demographic characteristics such as age, marital status, BMI, education level, spouse's education, duration of exercise (in minutes), and monthly family income. No statistically significant difference was found between the two groups in terms of these variables. The mean \pm standard deviation of age in the intervention and control groups was 38.97 ± 8.82 and 38.5 ± 7.12 , respectively. The mean \pm standard deviation of BMI in the two groups was 27 ± 3.76 and 28.79 ± 4.04 , respectively. In both

groups, the level of education of candidates was mostly at high school level or diploma (intervention group: 41.2%, control group: 38.3%). In terms of marital status, the majority of participants in both groups were married (intervention group: 88.2%, and control group: 97.1%). The mean duration of physical exercises was 5 min, and the interquartile range was 5–10 in both groups.

Table 1 indicates the data related to TPB before and after the intervention in both groups. As shown by Mann–Whitney U-test and independent-sample *t*-test results, there was no statistically significant difference between the two groups ($P > 0.05$) in the pretest. However, this difference was statistically significant in the posttest ($P < 0.05$).

In the present study, as shown by paired *t*-test and Wilcoxon's test results, in the intervention group, statistically significant differences were observed in the mean scores of TPB variables in the posttest. In fact, individuals in the intervention group obtained higher scores in attitude toward physical activity, subjective norms, perceived behavioral control, and behavioral intention. In the control group, however, no significant change was observed in the related mean scores.

The results showed no significant difference between the two groups in terms of the mean score of physical activity before the intervention. However, this difference was significant after the intervention. Furthermore, no significant difference was observed in the mean score of physical activity before and after the intervention in the intervention group [Table 2].

The results of Chi-squared test showed no statistically significant difference between the intervention and control groups in pre- and post-tests in terms of the

Table 1: Mean and standard deviation of theory of planned behavior variables across the two research groups in pre- and posttests

Variable	Group	Mean \pm SD		P***	
		Baseline	Intervention		
Attitude	Intervention	39.12 \pm 3.06	41.20 \pm 1.38	0.001	$t=-4.796$
	Control	39.35 \pm 3.36	39.17 \pm 2.85	0.534	$Z=-0.622$
	P	0.764	<0.001		
Subjective norms	Intervention	20.24 \pm 2.51	22.94 \pm 1.34	0.001	$t=-8.679$
	Control	20.88 \pm 2.34	20.64 \pm 2.32	0.317	$Z=-1.000$
	P*	0.276	<0.001		
Perceived behavioral control	Intervention	13.94 \pm 2.36	17.08 \pm 1.36	0.001	$t=-8.543$
	Control	13.09 \pm 2.03	13.14 \pm 2.41	0.680	$Z=-0.412$
	P*	0.115	<0.001		
Behavior intention**	Intervention	11.68 \pm 1.93	14 \pm (13-15)	0.001	$t=7.570$
	Control	11.59 \pm 1.86	12 \pm (10-13)	0.683	$Z=-0.408$
	P*	0.849	<0.001		

*Independent-sample *t*-test and Mann-Whitney U-test, **In this variable, in the intervention, median and interquartile range were used instead of mean and standard deviation, ***Paired *t*-test and Wilcoxon's test values. SD=Standard deviation

Table 2: Mean and standard deviation of physical activity score (metabolic equivalent of task) across the two research groups in pre- and posttests

Group	Mean±SD			Test value (Wilcoxon's test) P
	Baseline	Intervention	Mean difference	
Intervention	1157.12±1794.78	1317.26±674.22	-160.14±1770.82	Z=-3.246 P=0.001
Control	1007.43±890.41	704.95±465.59	302.47±873.62	Z=-3.009 P=0.003
Test value P (independent-sample t-test and Mann-Whitney U-test)	Z=-0.610 P=0.542	T=4.357 P=0.001	Z=-5.009 P=0.001	

SD=Standard deviation

stages of change. These results are summarized in Table 3.

Discussion

The present research aimed to investigate the effect of an educational intervention based on the TPB and stages of change construct on promoting the physical activity of female health candidates.

In this study, we tried to combine the two models of "stages of change model" and "TPB" in an educational program to improve physical activity in the study groups. The TPB consists of four constructs of attitude, subjective norms, perceived behavioral control, and intention. One of the effective factors in improving attitude toward an issue is to have knowledge about that issue. Thus, an attempt was made to use the stages of change model as an algorithm, in order to select those who had knowledge about the problem (the stage of thinking) and intention to do the behavior (the stage of readiness), and enroll them in the study.

The results pointed out to a more positive attitude in the intervention group which confirmed the effectiveness of educational sessions and appropriateness of the educational program for health candidates. These findings are consistent with the results of studies by Solhi *et al.*,^[4] Jafarpour *et al.*,^[16] Sadeghi and Khanjani,^[17] Hazavehei *et al.*,^[18] and Evans *et al.*^[19] However, the present findings are inconsistent with a body of research by Emami *et al.*^[20] and Parrott *et al.*^[21] This discrepancy can be due to the fact that the attitude of majority of the individuals in the pretest was good, and promoting this attitude at this level was not so easy.

Moreover, holding educational sessions on physical activity for the candidates' family and friends in the intervention group led to promote the subjective norms concerning physical activity. This finding is consistent with the results obtained by Solhi *et al.*^[4] and Sadeghi and Khanjani,^[17] but it is not in agreement with the results reported by Tabatabaei *et al.*^[3] and Parrott *et al.*^[21] They must have used other subjective norms than those of individuals in our intervention group.

Table 3: Distribution of the stages of change constructs of the two research groups in pre- and posttests

Group	Stage	Baseline	Intervention	Test value
				(χ ²); P
Intervention	Contemplation	13	14	0.061;
	Preparation and action	21	20	0.804
Control	Contemplation	12	15	0.553;
	Preparation and action	22	19	0.457
Test value (χ ²)		0.063	0.060	
P		0.801	0.806	

An increase in the mean score of perceived behavioral control in the intervention group indicated the candidates' higher awareness and belief that the existing barriers to physical activity are removable. This finding is in agreement with the findings of Solhi *et al.*,^[4] Parrott *et al.*,^[21] Martinsen,^[22] and Armitage^[23] Yet, it is inconsistent with the findings of Tabatabaei *et al.*'s^[3] study. These contradictory findings can be explained by climatic conditions and cold weather at the time of intervention. It can also be due to the cancelation of policy that encouraged physical activity at early work time made by the university management in the target department.

The mean score of behavioral intention in the intervention group in posttest increased which could possibly be due to the effect of lecture, stimulation, and encouragement to do physical activity. This finding is similar to the reports of Solhi *et al.*^[4] and Parrott *et al.*^[21] Furthermore, the finding in the posttest for the intervention group is consistent with the findings of Tabatabaei *et al.*'s^[3] study, but it does not agree with the results of control group as there was an increase in the mean score of behavioral intention of the control group in the posttest. This increase could have been induced by pretest in both groups.

Higher level of physical activity in the posttest in the present study is consistent with the findings of studies by Marcus *et al.*,^[24] Emami *et al.*,^[20] and Solhi *et al.*^[4] They found no statistically significant difference between

the research groups in terms of physical activity before the intervention. However, after the intervention, they found a statistically significant increase in the mean score of physical activity in the intervention group ($P < 0.001$). This finding is also similar to the study by Parrott *et al.*^[21] which attested to the positive effect of educational intervention. These findings, however, are not consistent with the study of Tabatabaei *et al.*^[3] that found no significant difference between the two research groups before and after the educational intervention. Moreover, in this research, encouragement and support of the family and friends was used as a form of social support to help initiate and maintain physical activities. No statistically significant difference was observed between the pre- and posttest in terms of the stages of change. This finding is consistent with the results reported by Zeidi *et al.*^[25] in the preintervention phase. In the present study, the majority of individuals were at the preparation stage in the pretest, which disagrees with the study of Collins,^[26] in which, the majority of individuals were at precontemplation or contemplation stages. The research findings by Zeidi *et al.*,^[25] Pourhaji *et al.*,^[8] and Aveyard *et al.*^[27] are different from those of the present research. This difference could be due to different sample size as the present study has a smaller sample than that of the above-mentioned studies. This difference could be further explained by the different research methodological procedures or models employed in these studies. Moreover, the time allocated had been inadequate to promote the physical activity of individuals to a higher stage.

Limitations

Among the limitations of this study were the researchers' lack of control over the individuals and their follow-up, especially in performing physical activities at home. Thus, in order to find out how much the individuals were physically active at home, self-report was used which could have affected the quality of the collected data. It is suggested that health-care authorities in medical centers should make more effort to raise people's awareness and hold educational courses for them. They should also create an environment suited for physical activity and provide appropriate gyms for this purpose. It is suggested to conduct further research to promote physical activity in different target groups and explore the effectiveness of methods used.

Conclusions

The present study provided useful information about the different stages of change with regard to physical activity and also psychological factors (attitude, subjective norms, perceived behavioral control, and behavior intention) that promote the physical activity of women at different stages. Prospective research should

employ certain strategies to raise the level of physical activity in accordance with the behavioral intention and perceived behavioral control. The results also pointed out to the effectiveness of educational intervention and the essentiality of using educational interventions to help adopt preventive behaviors. Therefore, the use of well-established educational models rather than conventional models is recommended.

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Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Launch of New Global Estimates on Levels of Physical Activity in Adults. Available from: <http://www.who.int/ncds/prevention/physical-activity>. [Last accessed on 2018 Oct 05].
2. Aghamolaei T, Farshidi H, Safari Moradabadi A, Dadipoor S. Effect of interventions based on the theory of planned behavior on promoting physical activity: A systematic review. *J Prev Med* 2017;3:15-1.
3. Tabatabaei SV, Taghdisi MH, Nakhee N, Balali F. Effect of educational intervention based on the theory of planned behaviour on the physical activities of Kerman health center s staff. *J Babol Univ Med Sci* 2010;12:62-9.
4. Solhi M, Zinatmotlagh F, Shirazi KK, Taghdisi MH, Jalilian F. Designing and implementing educational program to promote physical activity among students: An application of the theory of planned behavior. *Ofogh-E-Danesh* 2011;18:45-53.
5. Dadipoor S, Fallahi S, Safari-Moradabadi A, Ghanbarnejad A, Montazerghaem H. Investigation of the epidemiology of hypertension and BMI in the adult population in the province of Hormozgan, during 2011. *Life Sci J* 2013;10:161-6.
6. Hansen AM, Blangsted AK, Hansen EA, Sjøgaard K, Sjøgaard G. Physical activity, job demand-control, perceived stress-energy, and salivary cortisol in white-collar workers. *Int Arch Occup Environ Health* 2010;83:143-53.
7. Ahmadi-Tabatabaei S, Taghdisi M, Sadeghi A, Nakhaei N, Balali F. The effect of education in physical activities on knowledge, attitude and behavior of Kerman health center's staff. *J Res Health* 2012;2:137-44.
8. Marashi T, Ramezankhani A, Dadipoor S, Safari-Moradabadi A. Health problem multiple behaviors in Iranian adolescents: A cross-sectional study. *Int J Adolesc Youth* 2019;24:224-33.
9. Glanz K, Rimer BK, Viswanath K. *Health Behavior and Health Education: Theory, Research, and Practice*. San Francisco, CA: John Wiley & Sons; 2008.

10. Saffary M, Shjaeizadeh D, Ghofranipour F, Heydarnia A, Pakpour A. Health Education and Promotion (Theorise Models and Methods). Tehran: Tehran Sobhan; 2009.
11. Ghahremani L, Nazari M. Comparing prediction power of exercise intention and behavior based on self-efficacy and theory of planned behavior. *Payesh* 2013;12:99-107.
12. Davoodi SH, Agah B, Aghamolaei T, Ghanbarnejad A, Dadipoor S, Moradabadi AS. Fish consumption based on transtheoretical model among housewives. *J Educ Health Promot* 2018;7:25.
13. Marcus BH, Banspach SW, Lefebvre RC, Rossi JS, Carleton RA, Abrams DB. Using the stages of change model to increase the adoption of physical activity among community participants. *Am J Health Promot* 1992;6:424-9.
14. Lael-Monfared E. The Effects of Physical Activity Training on Occupational Burnout of The Effect of Education Based on Health Belief Model on Lifestyle Modification on Adopting Preventive Behaviors of Osteoporosis among Women in Mashhad 2014. Mashhad: Mashhad University of Medical Sciences School of Health; 2014.
15. Mahdizadeh MS. Effect of Social-Cognitive Theory Based Education on Physical Activity Promotion among Women with Type 2 Diabetes in Mashhad. Mashhad: Mashhad University of Medical Sciences School of Health; 2012.
16. Jafarpour K, Arastoo A, Shirvani ZG, Saki A, Araban M. Determining effect health education intervention based on the theory of planned behavior for promoting physical activity in women's health volunteer in Shoshtar health centers. *Iran J Obstet Gynecol Infertil* 2016;19:62-74.
17. Sadeghi R, Khanjani N. Impact of educational intervention based on theory of planned behavior (TPB) on the aids-preventive behavior among health volunteers. *Iran J Health Educ Promot* 2015;3:23-31.
18. Hazavehei M, Asadi Z, Hassanzadeh A, Shekarchizadeh P. Comparing the effect of two methods of presenting physical education II course on the attitudes and practices of female students towards regular physical activity in Isfahan University of Medical Sciences. *Iran J Med Educ* 2008;8:121-31.
19. Evans DW, Breen AC, Pincus T, Sim J, Underwood M, Vogel S, *et al.* The effectiveness of a posted information package on the beliefs and behavior of musculoskeletal practitioners: The UK chiropractors, osteopaths, and musculoskeletal physiotherapists low back pain management (COMPLEMENT) randomized trial. *Spine (Phila Pa 1976)* 2010;35:858-66.
20. Emami RS, Ardebil HE, Golestan B. Effect of a health education intervention on physical activity knowledge, attitude and behavior in health volunteers. *Hayat* 2011;16:48-55.
21. Parrott MW, Tennant LK, Olejnik S, Poudevigne MS. Theory of planned behavior: Implications for an email-based physical activity intervention. *Psychol Sport Exerc* 2008;9:511-26.
22. Martinsen EW. Physical activity in the prevention and treatment of anxiety and depression. *Nord J Psychiatry* 2008;62 Suppl 47:25-9.
23. Armitage CJ. Can the theory of planned behavior predict the maintenance of physical activity? *Health Psychol* 2005;24:235-45.
24. Marcus BH, Dubbert PM, Forsyth LH, McKenzie TL, Stone EJ, Dunn AL, *et al.* Physical activity behavior change: Issues in adoption and maintenance. *Health Psychol* 2000;19:32-41.
25. Zeidi EM, Agha AP, Karbord A, Zeid BM. Effectiveness of an educational intervention based on the trans theoretical model in order to smoking cessation in patients referred to dental clinics. *J Dent Med Tehran Univ Med Sci* 2015;28:146-58.
26. Collins C. Correlates of Breast Self-Examination: Application of the Transtheoretical Model of Change and the Health Belief Model. University of Cincinnati; 2005.
27. Aveyard P, Lawrence T, Cheng KK, Griffin C, Croghan E, Johnson C. A randomized controlled trial of smoking cessation for pregnant women to test the effect of a transtheoretical model-based intervention on movement in stage and interaction with baseline stage. *Br J Health Psychol* 2006;11:263-78.