

The Impact of Educational Intervention Based on Theory of Planned Behaviour on Housewives Aged 20–45 Years Old Physical Activity in Naein

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Abstract

Introduction: Today a sedentary life is known as a serious problem in Iran. Promoting lifestyle by increasing the amount of physical activity in order to achieve women's health and prevent cardiovascular diseases is essential. This study aimed at determining the impact of educational intervention based on Theory of Planned Behaviour on Housewives aged 20–45 years old physical activity in Naein city in 2013. **Materials and Methods:** In this semi-experimental prospective study Shohada Health Center and Shahid Hosseini health base were chosen among all Naein Health Centers and bases. Shohada Health Center and Shahid Hosseini base were randomly chosen as respectively, the intervention and the comparison groups. Totally, 92 women of qualified housewives (46 women from each base and centre) were chosen according to sample volume counting formula and entered the study. The study information has been collected using a designed questionnaire based on standard and autogenic questionnaires and involved 4 parts: Background variables, knowledge, Theory of Planned Behaviour factors. After being confirmed in terms of validity and reliability the autogenic questionnaire was given to intervention and comparison group members thus the information was gathered before the intervention. Then four educating sessions were held for the intervention group and immediately and 3 months afterwards the questionnaire was filled out again by both groups. Obtained information was analysed by SPSS 18 software using statistical tests including: Independent *t*-test, variance analysis using recurrent observations, Squaring and Mann–Whitney test. **Results:** The findings determined that the mean score of Theory of Planned Behaviour factors and pre-intervention functions had not significantly changed ($P > 0.05$). However, measuring the scores immediately and 3 months after the educational intervention demonstrated that the scores of both the Theory of Planned Behaviour factors and the function in intervention group immediately and 3 months after education sessions were significantly increased ($P < 0.05$). **Conclusion:** It seems that although housewives have got a positive attitude towards the advantages of physical activity but they have also got an improper lifestyle. Further studies were concerning the causes of this problem and removing physical activity obstacles such as providing more facilities for physical activity and promoting women health which play a vital role in family and society health.

Key words: Housewives, physical activity, theory of planned behaviour

INTRODUCTION

Physical activity is one of the essential solutions of health preservation and promotion in the entire life. The least physical activity needed to preserve and promote health in adults is 30 min activity with an average moderate and 5 times a week.^[1] Improving lifestyle by increasing the amount of physical activity in order to achieve women's health and prevent cardiovascular diseases, that can involve many personal, social and financial troubles, is emphasised. The advantages of physical activity include losing weight and keeping a desirable weight, reducing

depression, preventing incommunicable diseases, lowering the risk of cardiovascular diseases and promoting physical and mental health.^[2-5] Unfortunately, at least 60% of the

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world population do not have the amount of physical activity sufficient for health, though.^[6] Modern lifestyle has turned man to an inactive creature that leads to a dangerous health status^[7,8] and there are only a few people who have believed that they ought to reduce their work hours and exercise to stay healthy and fresh and enjoy health. Nevertheless, we can daringly indicate that by the time more people will believe in the importance of life quality and achieving this belief undoubtedly requires profitable experience and changing people's general viewpoints and attitudes towards the world.^[9] Regarding that women form almost half of the world population and their health undertakes the society health;^[10] hence, the physical activity can promote women's health and prevent women's main diseases and disabilities.^[11] Although there is a great deal of recommendations, people particularly women do not participate a lot in physical activities and the older they grow, the less their activity becomes so that only 14–16% of women aged 45–74 years old have a demanded physical activity.^[12]

Women's inactivity or immobility may be due to personal, mental and social causes which recognising and understanding them can help health service providers design and conduct appropriate and powerful interventions to promote physical activity behaviour. In fact, it is difficult to form and keep a physical activity behaviour; therefore, it is necessary to use behavioural modification theories and models on this line,^[13] because theories and models can recognise the main factors influencing behaviour and determine the relationship between those factors.^[14] One of the effective health education and promotion models is Theory of Planned Behaviour which has been practically proved to determine and predict different health behaviours, numerous studies have indicated that Theory of Planned Behaviour is effective to examine physical activity and interventional efforts in order to promote them.^[15-17] The individual intention is the most determinative factor in this theory which can be influenced by three factors including attitude, mental norms and perceived behavioural control.^[18] This theory is able to explain the relationship between health intention and behaviour on the average of 40%. Therefore, it is claimed that this model has got the potential capability to develop behavioural changing interventions.^[19]

Hence, understanding the amount of housewives' physical activity in the city and recognising its causes with regard to facilities and specific weather condition in that area can be help us make an educational and executional program that suits those facilities and condition to encourage them to have a regular physical activity and an appropriate intervention can be helpful in reforming the programme so that women be able to promote their own physical and mental health by making a balance between their physical activities and leisure time. Then it is expected that the current research would be able to present a proper and also practical advice to increase the amount of physical activity among housewives giving useful results and regarding numerous consequences of inactivity and the necessity of making an intervention to change this unhealthy behaviour, this study is aiming at demonstrating the

impact of educational intervention based on Theory of Planned Behaviour in housewives' physical activity.

MATERIALS AND METHODS

This study is a semi-experimental prospective study conducted to examine the impact of educational intervention based on Theory of Planned Behaviour on Naein city 20–45-year-old housewives' physical activity behaviour in 2012. The simple randomised sampling method was used in this study for choosing samples as follows: A health centre and a health base to which most qualified women refer to receive health care services in Naein city were picked. Totally, 92 women of qualified housewives were chosen according to sample volume accounting formula and entered the study. Afterwards 46 women among a health centre women were randomly picked for the intervention group, and 46 women among a health base housewives were randomly chosen for the comparison group. Entrance criteria included 20–45 years old aging, Naein city residence and literacy and excretion criteria included lack the tendency of participating in the research, disability and debilitating diseases. The intervention group received intended education and immediately and 3 months afterwards a final evaluation was carried out from both groups. It is noteworthy to mention that experienced individuals in this research were notified about the circumstances of conducting the study and confidentiality of the information and also of the purpose of doing the research, then they entered the study willingly all purposes took place by a justification from Isfahan University of Medical Sciences and presenting an introduction letter to Naein city health network.

Questionnaires were used for gathering information in this study and the information was collected by filling questionnaires up as a self-reporting way and within 3 times: Before the intervention, immediately and 3 months after it.

The questionnaire used in this research included four portions:

Demographic and background questions

This portion contained five questions and assessed housewives' information about age, financial status, the number of children, educational level and sport clubs fellowship.

Questions concerning knowledge and theory of planned behaviour factors

Information was gathered in this portion using a research-based questionnaire and guidelines and available standard tools including knowledge (10 Qs), attitude towards behaviour (5 Qs), subjective norms (4 Qs), behavioural intention (5 Qs) and perceived behavioural control (6 Qs).

Likert measure was used to examine the score status of different aspects of the theory. 5-degree Likert measure was used for attitude, behavioural intention and perceived behavioural control questions and 4-degree Likert measure was used for mental norms questions. Since there was not any standard questionnaire for the Theory of Planned Behaviour related to this study so the questionnaires used were designed

according to Francis *et al.*^[20] and Hagger *et al.*^[21] theory. The designed questionnaires' content credit and the structure were evaluated and confirmed by 15 masters' judgements and slight changes were made. A primary study on 15 women among housewives was conducted to examine the reliability of this portion's questionnaires and the validity of all questionnaires except the questions concerning knowledge was confirmed using α -Cronbach test in the following way:

The attitude included five questions (α coefficient of 0.84), scored in 5-option Likert spectrum including strongly agree option to strongly disagree option and score spectrum for attitude questions was measured from 0 to 4 as the option 'strongly disagree' was given a 0 score and the option 'strongly agree' was given a 4 score.

Subjective norms included five questions (0.83) which the scoring was designed as a 4-square Likert spectrum including 'always' to 'never' options and the score spectrum in these questions was measured from 0 to 3 as the 'never' option was given a 0 and the 'always' option was given a 3 score.

Perceived behavioural control included 6 questions (0.74) designed as a 5-option Likert spectrum involving 'strongly agree' to 'strongly disagree' options and the score spectrum for perceived behavioural control questions measured from 0 to 4 as 'strongly disagree' option received 0 and 'strongly agree' one received 4 score.

Behavioural intention included 5 questions (0.89) designed as a 5-option Likert spectrum including 'most probably' to 'almost never' options and score spectrum for behavioural intention was measured from 0 to 4 as 'almost never' option received 0 and 'most probably' one received 4 score.

Intentional questionnaire of physical activity

This questionnaire examines function questions (physical activity during the past 7 days). Physical activity function scoring was according to International Physical Activity Questionnaire standard questionnaire and Questionnaire International Protocol. According to this instruction, the intensity of total physical activity done by each person was placed in one of these three groups: Light, average and heavy according to the middle consumed energy during the past 7 days.^[22] Activities timed <10 min were skipped and if the combination of extreme and average physical activities or hiking reached 600 Met-min/week during at least the past 5 days, physical activity intensity of the relevant questionnaire would be considered average. If the total consumed energy for extreme physical activities reached 1500 Met-min/week during at least 3 days of the past 7 days or if the total consumed energy for doing a combination of average and extreme activities or hiking at least reached 3000 Met-min/week during the past 7 days, the intensity of physical activity would be considered extreme. If the questionnaire reported no activity and lacked the above conditions, the intensity of its activities would be categorised as low or light.^[22]

Educational planning in this research was based on active learning and we tried to have women actively participate in the educational plan during the educational intervention and educating was done using methods including: Lecturing, group discussion, powerpoint slide showing, maieutic, role playing and giving booklets related to regular physical activity in 4 sessions to intervention group women. Sessions were run by a Health Education M.S. student and a Physiotherapy M.S. student. The teacher started the first session with the purpose of attracting the educational plan objects into the learners' attention and presented general points relevant to physical activity as well. The importance of physical activity, inactivity troubles and diseases caused by inactivity were explained to the audience during the second session.

Physical activity obstacles were explained to the audience during the third session and an aerobic training class was held by the Physiotherapy M.S. student during the fourth session for the participants. A booklet, a registration form of daily physical activities, and a key ring with (Exercise, Today Intention, Tomorrow Health) slogan were given to the participants in the final session.

After completing the questionnaires, the obtained data were entered into the SPSS software version 18. The measure considered to analyse the data concerning attitude and Theory of Planned Behaviour factors questions score of 100 regarding that multiplication and division had no effect on statistical test results. Variance analysing test with recurrent observations was used to compare the mean of attitude and Theory of Planned Behaviour factors scores in each intervention and comparison group before the intervention, immediately, and 3 months after it and independent sample *t*-test was used to compare both groups with each other. Moreover, the statistical tests including Squaring and Mann-Whitney test were used to analyse demographic variables.

RESULTS

Intervention and comparison groups were compared in terms of background factors such as age, educational level, children number, financial status and sport club fellowship using statistical independent sample *t*-test and Squaring and they were not significantly different.

The research participant's age ranged from 20 to 45 years old with a mean of 31.58 and a standard deviation of 6.86.

Theory of Planned Behaviour factors information before the intervention, immediately, and 3 months after the educational intervention between both groups is shown in Table 1. As it is shown intervention and comparison groups shared identical features before the educational intervention and the resulted changes after the educational intervention are due to the educational intervention done in the intervention group [Table 2 and 3].

Table 1: The mean score of theory of planned behaviour factors in both study groups before the educational intervention, immediately and 3 months after it

Variable	Groups						P value (independent t-test)							
	Intervention group			Comparison group										
	Mean			Mean										
	Before	Immediately	After	Before	Immediately	After								
Attitude	83.8	93.6	93	11.7	8	9.8	81.5	82.7	82.4	12.3	14.5	12.2	0.37	0.001
Behavioural intention	60.4	86.2	83	22.2	13.2	19	58.2	59.7	58.4	19.6	21.5	21.8	0.6	0.001
Subjective norms	62.5	77.1	80.3	22.6	20.4	21	61.4	63.5	65.2	20.6	23.2	19.7	0.8	0.001
Perceived behavioural control	47.6	75.9	81	10.9	13.9	15.7	50.7	51.3	51.4	13.6	13.9	14.4	0.22	0.001
SD: Standard deviation														

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DISCUSSION

Scientific evidence shows that the risk of disease caused by inactivity is significantly reduced in individuals doing a regular physical activity and get to a suitable fitness.^[23] Understanding about the amount of housewives' physical activity and recognising its causes can help us make an exclusive and educational programme in order to encourage women to do physical activity and improve it properly and Theory of Planned Behaviour is extensively used for health Behaviours including physical activity.^[15] This study aimed at determining the impact of educational intervention based on the Theory of Planned Behaviour on housewives' physical activity.

Study findings revealed that both groups' attitude towards physical activity was acceptable before the educational intervention. Saber *et al.* determined that female students attitude towards physical activity is acceptable.^[17] The mean score of intervention group members attitude in this study increased immediately and 3 months after the intervention. These changes can demonstrate how effective the educational plan has been for promoting a positive attitude in women towards doing physical activity. In fact this can be attributed to applying different and various educational methods and an appropriate communication with learners and explaining modern concepts of physical activity according to international standards in educational intervention framework based on the Theory of Planned Behaviour. These findings confirm that using a logical message transfer system along with applying the Theory of Planned Behaviour can effectively change women Behaviour and attitude.^[24] These findings were consistent with numerous similar studies including Pincus study, Evans *et al.* was shown that training through educational package among Orthopaedics staff and Physiotherapists had a positive impact on their beliefs and increased their physical activity and improved their lifestyle as well.^[25] Furthermore, Hazavehei *et al.* study demonstrated that university students attitude score towards physical activity has significantly increased 2 months after the educational intervention.^[26]

Housewives' subjective norms towards physical activity in both groups were average before the educational intervention and considering the scores we can find out that both groups are in similar level and there is no statistically significant difference between both groups before the educational intervention, Saber *et al.* was shown that subjective norms were in an average level before the intervention.^[17] Nonetheless, immediately and 3 months after the educational intervention mean score of subjective norms promoted in the intervention group. On the other hand, the score of subjective norms did not change noticeably in the comparison group. Furthermore, a study by Wallace *et al.* showed that students subjective norms towards physical activity were increased after the educational intervention according to the Social Cognitive Theory^[27] and also another study by Downs *et al.* on youth showed that subjective norms were increased after the intervention,^[28] whereas a study by Parrott *et al.* showed that subjective norms were yet in an average level after the intervention and there was

Table 2: The mean score of attitude, behavioural intention, subjective norms and perceived behavioural control in study groups before the education, immediately and 3 months after it

Variable	Group	Mean			SD			P value Mann-Whitney U-test
		Before	Immediately	After	Before	Immediately	After	
Attitude	Intervention	83.8	93.6	93	11.7	8	9.8	0.001
	Comparison	81.5	82.7	82.4	12.3	14.5	12.2	0.83
Behavioural intention	Intervention	60.4	86.2	83	22.2	13.2	19	0.001
	Comparison	58.2	59.7	58.4	19.6	21.5	21.8	0.8
Subjective norms	Intervention	62.5	77.1	80.3	22.6	20.4	21	0.001
	Comparison	61.4	63.5	65.2	20.6	23.2	19.7	0.43
Perceived behavioural control	Intervention	47.6	75.9	81	10.9	13.9	15.7	0.001
	Comparison	50.7	51.3	51.4	13.6	13.9	14.4	0.94

SD: Standard deviation

Table 3: Physical activity status among both study groups before, immediately and 3 months after the education

Variable	Time	Before of educational intervention			Immediately of educational intervention			After of educational intervention			P value Mann-Whitney U-test		
	Group	Light	Moderate	Intensify	Light	Moderate	Intensify	Light	Moderate	Intensify	Light	Moderate	Intensify
Physical activity	Intervention	37	7	2	15	26	5	10	29	7	0.81	0.001	0.001
	Comparison	36	8	2	35	7	4	31	11	4			

no significant increase in nor of intervention and comparison groups.^[29] This finding is adverse to the present study. In this study, the score of subjective norms 3 months after education had a significant difference with the score of this factor before the education. This difference in results may be due to the fact that in this study housewives were greatly influenced by their relatives and this study made them change their thought about understanding important people in their lives through sessions that probably could positively promote subjective norms related to physical activity and as results show this change has been statistically significant.

Housewives' perceived behavioural control towards physical activity in both groups was similar before the educational intervention and then there was no statistically significant change between them. However, immediately and 3 months after the educational intervention mean score of perceived behavioural control was promoted in the interventional group, whereas the score of perceived behavioural control did not noticeably change in the comparison group. The results of Solhi *et al.* study revealed that behavioural control score of intervention group members towards physical activity was significantly increased compared to comparison group after conducting the educational program.^[15] Nevertheless, in another study by Tabatabaei *et al.* it was shown that perceived behavioural control was significantly reduced in the intervention group after the educating intervention.^[30] This finding is adverse to our study. In our study, the score of perceived behavioural control after education had significantly increased compared to this factor's score before the education. This difference may be due to the difference in target group, intervention type, perceived behavioural control measuring instrument, weather condition

and the cold weather in Tabatabaei intervention duration or it may be due to abolishing the policy of doing physical activity at the beginning of work time in Tabatabaei study. Housewives' behavioural intention towards physical activity in both groups was similar before the educational intervention, and there was no statistically significant difference between the two groups. However, immediately and 3 months after the educational intervention intention score promoted in intervention group, whereas this score was not significantly changed in comparison group. This finding was consistent with a great deal of studies including Parrott *et al.* who showed that messages containing positive and negative back grounds have significantly increased behavioural intention towards physical activity among students.^[29] Moreover, another study by Reger *et al.* using media showed that behavioural intention has a significant increase on senior citizen's hiking.^[31] There was no significant difference concerning function and doing physical activity between groups but function was promoted immediately and 3 months after the educational intervention, whereas it was not noticeably changed in comparison group. The impact of intervention according to Theory of Planned Behaviour demonstrates its permanent and effective influence immediately and 3 months after education indicates that lasting of education and placing subjective norms, perceived behavioural control and more stimuli into the intervention group is what has led women to an appropriate function according to international recommendations. Dinger *et al.* concluded in their study that Educational interventions in among sedentary women led to their functional improvement towards physical activity.^[32] Moreover, Pazoki *et al.* concluded in their study that educational intervention led to functional improvement among 25–64-year-old women towards physical

activity.^[33] Furthermore, a research by Woods *et al.* named 'The Impact of Educational Plan on Sedentary Adults' concluded that sending educational messages on the ground of living with activity led to promoting physical activity among them.^[34]

According to scientific resources although the increasing the amount of physical activity among sedentary adults is difficult but it is possible, meanwhile, increasing physical activity for a short period (3–12) weeks is relatively attainable, whereas this change can hardly be preserved for a long period (6–24) months. To achieve this goal we need to assemble a plan of models and theories related to the target group behaviour through a continuous follow-up.^[35]

Although these study findings have promoted our insight towards the impact of educational intervention based on the recommended model related to physical activity but it attended some restrictions. First, a cross-sectional study was used to describe the relationship between variables in this project, the basic trait of cross-sectional studies is that the data is gathered in single time duration and this fact restricts the ability of determining causality relationships between variables. Second, in this study the data were gathered in a self-report method, thus it might not reflect the real function of individuals.

CONCLUSION

This study results sport the effectiveness of the Theory of Planned Behaviour in promoting physical activity among women and seems that if Theories of Behaviour Analysis are appropriately used in conducting educational plans, they would result in advantageous outcomes. According to this study results, stimulating attention, changing personal attitudes, subjective norms and perceived behavioural control can effectively increase the amount of physical activity. Likewise, providing more general exercising programs, emphasising on the pros of regular physical activity including the importance of self-confidence and the increase of energy, holding educational courses for families in order to attract their attention to exercising and physical activity and presenting solutions to overcome today physical activity obstacles are among strategies used to increase the amount of physical activity among women.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. WHO. Physical Activity/Physical Inactivity; 2014. Available from: <http://www.who.org/physicalactivity/physicalinactivity>.
2. Annesi JJ. Behaviorally supported exercise predicts weight loss in obese adults through improvements in mood, self-efficacy, and self-regulation, rather than by caloric expenditure. *Perm J* 2011;15:23-7.
3. Mikkelsen SS, Tolstrup JS, Flachs EM, Mortensen EL, Schnohr P, Flensborg-Madsen T. A cohort study of leisure time physical activity and depression. *Prev Med* 2010;51:471-5.
4. Prichard I, Tiggemann M. Relations among exercise type, self-objectification, and body image in the fitness centre environment: The role of reasons for exercise. *Psychol Sport Exerc* 2008;9:855-66.
5. WHO. World Health Report. Geneva, Switzerland: WHO; 2009.
6. WHO. Physical Inactivity: A Global Public Health Problem; 2014. Available from: http://www.who.int/dietphysicalactivity/factsheet_inactivity/en/.
7. Mazloomi S, Mohammadi M, Sharifabad MM. Exercise and its relation to self efficacy based on stages of change model in employees of Yazd in 2008. *J Kerman Univ Med Sci* 2010;17:346-54.
8. Dishman R. Increasing and maintaining exercise and physical activity. *Behav Ther* 1991;22:345-78.
9. Tondneveis F. Place physical activity in leisure Iranian females. *J Harekat* 1380;12:87-104.
10. Keshavarz Z, Simbar M, Ramezankhani A. Effective factors on nutritional behavior of female workers based on "integrated model of planned behavior and self-effi cacy": A qualitative approach. *J Res Hakim* 2011;13:199-209.
11. Jalilian F, Emdadi SH, Mirzaie M, Barati M. The survey physical activity status of employed women in Hamadan University of Medical Sciences: The relationship between the benefits, barriers, self-efficacy and stages of change. *J Sci Yazd Health Sch* 2010;9:89-99.
12. Norozi A, GHofranpour F, Heidarnia R, Tahmasebi R. Influence factor on physical activity regular performance on base health promotion model in client diabetic of woman to Karaj diabetic of associate. *J Tebb South* 2009;13:41-51.
13. Yamaguchi Y, Miura S, Urata H. The effectiveness of a multi-component program for nutrition and physical activity change in clinical setting: Short-term effect of PACE/Japan. *International Journal of Sport Health Sciences* 2003;1: 29-37.
14. Nutbeam D, Harris E. Theory in a Nutshell: A Practical Guide to Health Promotion Theories. 2nd ed. Australia: McGraw-Hill; 2004.
15. Solhi M, Zinatmotlagh F, Shirazi K, Taghdisi M, Jalilian F. Designing and implementing educational program to promote physical activity among students: An application of the theory of planned behavior. *J Ofogh Danesh* 2011;18:45-53.
16. Didarlo A, Shojaezade D, Eftekhar Ardebil H, Niknami SH, Hajezeade E, Alizade M, *et al.* Determinant physical activity on base theory of planned behaviour in diabetic woman. *Faslname Payesh* 2012;11:201-11.
17. Saber F, Shanazi H, Sharifrad GH. The survey of theory of planned behavior constructs regarding girl student's physical activity in Naein Payame Noor University in 2012. *J Health Syst Res* 2013;9:1-9.
18. McKenzie JF, Neiger B, Thackeray R. Planning Implementing and Evaluating Health Promotion Programs. 4th ed. USA: Pearson Benjamin Cummings; 2005. p. 143-77, 180-206, 211-29.
19. Stead M, Tagg S, MacKintosh AM, Eadie D. Development and evaluation of a mass media theory of planned behaviour intervention to reduce speeding. *Health Educ Res* 2005;20:36-50.
20. Francis JJ, Eccles MP, Johnston M, Grimshaw J, Foy R, Kaner EF, *et al.* Constructing Questionnaires Based on the Theory of Planned Behavior: A Manual for Health Services Researchers. 1st ed. UK: University of Newcastle; 2004.
21. Hagger MS, Chatzisarantis NL, Barkoukis V, Wang JC, Hein V, Pihu M, *et al.* Cross-cultural generalizability of the theory of planned behavior among young people in a physical activity context. *J Sport Exerc Psychol* 2007;29:2-20.
22. International Physical Activity Questionnaire (IPAQ) Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire; November, 2005. Available from: <http://www.ipaq.ki.se/scoring.pdf>. [Last cited on 2008 Jan 27].
23. Amini N, Shojaezade D, Saffari M. The study of the effect of e-education on physical activity and body mass index of female employees. *Sci J Sch Public Health Inst Public Health Res* 2013;11:95-106.
24. Biddle SJ, Mutrie N. Conclusion and future direction. *Psychology of*

- Physical Activity, Determinations and Well-being and Intervention. London, New York: Routledge; 2001.
25. 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.
 26. Hazavehei M, Asadi Z, Hassanzadeh A, Shekarchizadeh P. Survey the effect of two methods of presenting physical education on the based BASNEF on female students towards regular physical activity in Isfahan University of Medical Sciences. *Iran J Med Educ* 2008;17:70-83.
 27. Wallace LS, Buckworth J, Kirby TE, Sherman WM. Characteristics of exercise behavior among college students: Application of social cognitive theory to predicting stage of change. *Prev Med* 2000;31:494-505.
 28. Downs DS, Graham GM, Yang S, Bargainnier S, Vasil J. Youth exercise intention and past exercise behavior: Examining the moderating influences of sex and meeting exercise recommendations. *Res Q Exerc Sport* 2006;77:91-9.
 29. Parrott M, Tennant L, Olejnik S, Poudevigne M. Theory of planned behavior: Implications for an e-mail-based physical activity intervention. *Psychol Sport Exerc* 2008;9:511-26.
 30. Tabatabaei SV, Taghdisi MH, Nakheei N, Balali F. Effect of educational intervention based on the theory of planned behaviour on the physical activities of Kerman health centers staff (2008). *J Babol Univ Med Sci* 2008;12:62-9.
 31. Reger B, Cooper L, Booth-Butterfield S, Smith H, Bauman A, Wootan M, *et al.* Wheeling walks: A community campaign using paid media to encourage walking among sedentary older adults. *Prev Med* 2002;35:285-92.
 32. Dinger MK, Heesch KC, McClary KR. Feasibility of a minimal contact intervention to promote walking among insufficiently active women. *Am J Health Promot* 2005;20:2-6.
 33. Pazoki R, Nabipour I, Seyednezami N, Imami SR. Effects of a community-based healthy heart program on increasing healthy women's physical activity: A randomized controlled trial guided by community-based participatory research (CBPR). *BMC Public Health* 2007;7:216.
 34. Woods C, Mutrie N, Scott M. Physical activity intervention: A transtheoretical model-based intervention designed to help sedentary young adults become active. *Health Educ Res* 2002;17:451-60.
 35. Biddle SJ, Mutrie N. Intervention strategy for the individual. *Psychology of Physical Activity, Determinations and Well-being*. London, New York: Routledge; 2001.

