Physical Activity Status Among Women Referred to Health Centers in Izeh, Iran

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Abstract

Background: Over the past decades, numerous well-established studies have reported the benefits of physical activity including physical health, obesity prevention and psychosocial health. Despite all these advantages, many people still engage to little leisure-time physical activity.

Objectives: The present study focused on the status of physical activity among women referred to three health centers on the basis of the trans theoretical model.

Patients and Methods: This was a cross-sectional study with 310 randomly selected females referred to health centers in Izeh, Iran, in 2014. To collect data, a valid and reliable (content validity index (CVI) = 0.87, content validity ratio (CVR) = 0.9 and Cronbach's alpha level = 0.87) physical activity questionnaire was used. It included items on self-efficacy, benefits, processes of change, and barriers. To analyze the data, statistical tests including t-test, analysis of variance, chi-squared and correlation were implemented using SPSS 16 software. Results with a $P < 0.05$ were considered significant.

Results: More than 50% of the sample population was at the pre-contemplation stage. The mean age of females in this study was 28.7 ± 6.61. The mean scores of constructs of the model among females in this study showed that there was a non-significant relationship in performing physical activities and females' jobs (Housewife, practitioner) and their education level and also their husbands ($P > 0.05$). Except for the structure of the barriers, women who had employed husbands reported more barriers to do physical activity ($P < 0.05$).

Conclusions: Given the importance of physical activity, and given that most women are at the pre-contemplation stage of the trans theoretical model, it seems necessary to devise educational interventional plans for the promotion of physical activities among women referred to health centers.

Keywords: Physical Activity, Women, Trans Theoretical Model

1. Background

Regular physical activity reduces the extensive risk of health problems such as being overweight, cardiovascular disease, stroke, type 2 diabetes, breast cancer, large intestine cancer, osteoporosis and backache and it strengthens the immune system. Moreover, regular exercise supports mental well-being, facilitates a good night sleep, and promotes mobility and independence at old ages (1).

Physical activity also provides a wide spectrum of psychological advantages such as the short-and long-term improvement of anxiety and self-esteem (2).

World health organization (WHO) regards the absence of physical activities as one of the initial risk factors for coronary vascular disease; the results of 27 futurist meta-analyses have indicated that regular physical activity contributes to 35% - 55% decreased cardiac infarction (3).

Physical activities are also greatly associated with de-creased morality rate. Nonetheless, few people are involved in physical activities. A center for control and prevention of diseases reported in 2010 a participation rate of 11.5% and 10.3% in the average-level physical activities among +19-year-old males and females in 2014, respectively. The US Sports Medicine recommended physical activity three to five times per week at least 30 minutes a day, which is quite similar to WHO recommendation (4).

New Zealand health ministry defines physical activity on the basis of difficulty in body movement at the time of activity, classifying it into three types: light, average, and extreme. Light physical activity includes the usual activities in daily life, which requires little effort although they consume daily energy. Average activities include those that increase the usual breathing and heartbeat, but the person is able to speak. Extreme physical activities include those that greatly increase the breathing and heartbeat and the person is not able to interact in a dialog (5).

Although physical activity has a lot of benefits and advantages, many people spend little time doing physical activity in their free time (1). According to WHO, immobility is prevalent among 76.3% of 15-64-year-old Iranian females (6).

Some studies have also reported immobility among Iranian females. For example, a study of non-insulin-dependent diabetic women in Isfahan reported that 90% of females with diabetes were immobile in their free time. Although the time spent on house-keeping activities by the females in the study was more than that spent by American women, 99.3% of the house-keeping activities among females with diabetic were classified as light and very light (7).

For physiological reasons such as the gestation period, lactation and menopause, females are more susceptible to diseases and disability. They also get affected by diseases associated with absence of physical activities. In most domains, moreover, females are less physically active than males (8).

To this end, a theoretical framework has been used to comprehensively study the factors influencing physical activity. This model is the transtheoretical model (TTM) which was introduced by Prochaska and Declement as a comprehensive model of behavior change for studying behavior predictors. The assumption at this stage is that persons can have different stages of preparation for behavior change, and therefore they may undergo a series of stages, including five stages as follows (9):

Pre-contemplation: a stage in which persons do not have any physical activity or any intention to have physical activity during the next six months. Contemplation: persons have the intention to change their behaviors in the next six months. Preparation: persons have the intention to change their behaviors in the next month. Action: persons show the behavior more than one day and less than six months. Maintenance: persons show a desired behavior more than six months (10).

One of the basic hypotheses in the model is that there is the probability in each stage for slip, which is returning to the previous behavior. Two constructs of decisional balance and self-efficacy serve as mediators for the determinations of change time. The decisional balance has been defined as the advantages or benefits [pros], disadvantage [cons], and costs of behavior change according to the persons' opinions. When persons decide to change behavior, they weigh up the pros and cons of the behavior before the action. In other words, the decisional balance is the cognitive evaluation of positive or negative aspects of a behavior by a person, showing the reason for change or no change of the person (11).

The processes of change include those activities and strategies that help the person to progress in the stages of change. They include two main classes of cognitive processes (relating to thinking and feeling of persons about unhealthy behaviors) and behavioral processes (causing the changes of unhealthy behaviors) (12).

Empirical processes (increase of awareness, affective relief, reevaluation of environment, self-evaluation, social freedom), behavioral processes (counter conditioning, resourceful relationships, reinforcement management, self-emancipation, stimulus control) (10), and regular physical activity are among the behaviors that can be used for devising appropriate interventions through the collection of basic data, so that persons can be directed to begin physical activity (8).

2. Objectives

Given that no study has been conducted on females' physical activity in Izeh, Iran, the present study focuses on the status of physical activity among females referred to three health centers on the basis of the TTM.

3. Patients and Methods

The present study was conducted on females referred to health centers in Izeh in 2014. After receiving the necessary documents including permits and licenses from the Faculty of Health, Jundishapour University of Medical Sciences, Ahvaz, Iran, providing them to officials in the health center of Izeh and performing the necessary bureaucratic coordination, a list of urban health centers was prepared. Izeh has four urban health centers and two hygiene bases, of which three were randomly selected and a convenience sampling method was used to recruit the samples. These samples were recruited as a rule of thumb considering 10 participants for each item in the questionnaire with 5% dropouts.

The criteria used in the present study for the participants included the ability to read and write, not being pregnant, and no illness. Before the start of this program, the research objectives were explained to the women, and it was emphasized that their willingness was necessary for the study.

The data collected for this study consisted of demographic characteristics (age of women, number of children, age of the youngest child, occupation, education, weight, height, husband's education, husband's occupation, stages of change, perceived self-efficacy processes of change and decisional balance, and the type of physical activity (light, average, or extreme). Using available literature (10-15), a valid and reliable questionnaire based on

TTM in addition to a demographic form were used to collect data. At first, a pool of items was generated, then using a panel of expert comments the final questionnaire was provided with content validity index (CVI) = 0.87, content validity ratio (CVR) = 0.9 and Cronbach's alpha level = 0.87. The stages of change consisted of five yes-no questions. The participants were asked to respond to one question choosing the statement that best described their status. The response options were: 1) I am currently not engaging in any physical activity. I am not thinking to do so in the upcoming six months. 2) I am not currently doing physical activity but I am thinking of doing so in the upcoming six months. 3) I am not currently doing any type of physical activity, but I plan to do so within the next month. 4) I am currently doing physical activity but I have been doing so for less than six months. 5) I have been doing physical activity already for more than six months.

The perceived self-efficacy consisted of five items with the following options: I am not sure at all, I am not sure to some extent, I am relatively sure, I am very sure, and I am quite sure. Each item was given a score from 1 to 5.

The mean score was calculated for the subjects, which ranged from 5 to 25. The decisional balance for regular physical activity, which identifies the positive and negative aspects of doing the regular physical activity, consisted of five items for perceived benefits with a score ranging from 5 to 25, and four items for perceived barriers were assessed by the following options: I completely disagree, I disagree, I have no idea, I agree, I completely agree. After the mean scores were calculated for subjects in this section, it showed that the scores ranged from 4 to 20.

The processes of change consisted of 10 items, each item representing one process, and the responses were in the forms of the following options: Never, rarely, sometimes, often, and always, with scores ranging from 1 to 5, respectively. The mean score was calculated for each respondent. The scores ranged from 10 to 50.

The measurement of behavior is based on the promotion or progress in the stages of change and with respect to the type of physical activity (light, average, and extreme). For validity reassessment, copies of the questionnaire were given to 10 professors, some small modifications were made, and the questionnaire validity was confirmed after the calculation of mean scores given to the items by the professors. Given that the number of professors was 10, the number obtained with the cutoff point on Lawshe's comparison table was $\geq$ 0.62, and for the constructs it was reported to be between the following values, which was greater than the number obtained from Lawshe's table: CVR = (0.7 - 1), CVI = (0.8 - 1).

In addition, the research reliability was confirmed by means of a pilot study on 25 females among participants, and also by means of alpha Cronbach test for the self-efficacy constructs ($\alpha = 0.76$), the pros ($\alpha = 0.78$), processes of change ($\alpha = 0.89$), and cons ($\alpha = 0.73$). Then, data collection was completed by the interviewer and the data were analyzed by SPSS 16 through t-test, variance analysis, and the correlation at a significance level of 0.05.

4. Results

The participants in the present study were 310 females referred to health centers, the age range being from 12 to 47 years old, and the average age being 28.7 ± 6.61. Their average of body mass index (BMI) was 29.04 ± 5.07. The females' demographic characteristics are presented in Table 1. The highest frequency of persons was at the precontemplation stage (Table 2).

In the present study, t-test was used to compare the mean scores of construction among employed and housewife females, and independent t-test did not show any significant relationship between construction and the women's employment status (P > 0.05), with the exception of the construct of barriers where the mean score was higher among employed women. Indeed, employed women experienced more barriers (P < 0.05) (Table 3).

In terms of the mean scores of constructs in the model, independent t-test did not show any significant relationship between the husband's occupation (whether self-employed or civil servant) and physical activity (P > 0.05) and the exception of the construct of the construct of barriers, where women with civil servant husbands reported more obstacles to physical activity (P < 0.05).

In terms of mean scores of constructs, the ANOVA test did not show any significant relationship between education (including their own education and that of their husbands) and physical activity, with the exception of the construct of barriers where women with higher education levels (and women with higher-educated husbands) reported more barriers (P < 0.05). Moreover, our results showed that there was no significant relationship between the mean scores of constructs and the age of the youngest child (P > 0.05).

To assess the relationship between the model constructs and BMI, Pearson's correlation test exhibited the following results: there was a significant inverse relationship between self-efficacy and BMI (P = 0.01, r = -0.37), change processes and BMI (P = 0.04, r = -0.1), and benefits and BMI (P = 0.03, r = -0.1), and there was no significant relationship between barriers and BMI (P = 0.1, r = 0.07).

Table 1. Demographic Characteristics of the Sample Under Study

Values	No. (%)
Women' education level	
Primary	27 (8.7)
Secondary school	55 (17.7)
High school	119 (38.4)
Academic	109 (32.2)
Employment status of women	
Housewife	259 (83.5)
Employed	51 (16.5)
Husband's education	
Primary	32 (10.3)
Secondary school	57 (18.4)
High school	114 (36.8)
Academic	107 (34.5)
Employment status of husband	
Self-employed	222 (17.61)
Employee	88 (28.4)
Number of children	
1	104 (33.5)
2	104 (33.5)
More than 2	102 (33)
Age of last child, year	
under 1	159 (51.3)
1 - 2	78 (25.2)
more than 2	73 (23.5)
Type of physical activity	
Light	238 (76.8)
Average	59 (19)
Severe	13 (4.2)

Table 2. Number of Participants in Each Stage of Exercise Behavior Change

Stage of Change	No. (%) (n = 310)
Pre-contemplation	180 (58.08)
Contemplation	39 (12.58)
Preparation	46 (14.83)
Action	16 (5.16)
Maintenance	29 (9.35)

5. Discussion

The present paper tried to study the status of physical activity among females referred to health centers, and the results showed that most of them were at the pre-contemplation stage. Considering the fact that immobility is one of the 10 main causes of death and disability, and that two thirds of deaths per year are caused by the absence of physical activity, the results will be highlighted.

In a study by Klompstra et al. [13] one-third of the subjects had low levels of activity, and this confirms our research findings. Sjogren's study [14] also on physical activity showed that most persons were inactive.

However, in Kirk's study [9] consisting of a sample with 85 adults, 40 of whom being female, none of the females were at the pre-contemplation stage and this does not agree with the findings in the present study. The disagreement might be due to the difference of age group, as Alison's sample consisted of elderlies who had more free time to engage in physical activities, and also they felt they were more susceptible to diseases because of their age, and therefore they performed physical activities to prevent diseases.

In the present study, no significant relationship could be seen between the women's education level and physical activity. Jones et al.'s study [15] in 2013 does not agree with these findings.

Thornorarinsson et al.'s study [16] did not show any significant relationship between education and physical activity.

In Shaw et al.'s study [17], there was a significant relationship between education and physical activity, but the reason of this disagreement might have been the fact that some of the participants in Souri's study were illiterate.

The mean scores of perceived barriers were higher among employed females than those among housewife ones. Findings of Finger showed that physical activity was affected by job, and this does agree with the findings in the present study [18], while the study by Hernandez [19] did not show such association. This could be explained by differences between regions of the studies.

The mean scores of perceived barriers were higher among women whose husbands were civil servants with higher education levels compared to those among women whose husbands were self-employed without higher education levels. In Roozbahani's study [20] on physical activity behavior among pregnant women, no significant relationship was seen between husband's education and the wife's physical activity.

However, the study indicated that civil-servant husbands might be a barrier to women's physical activity. Some studies have suggested that the main barrier to physical activity among females is the insufficient time associated with family responsibilities [18].

Number of children, however, does not have any significant relationship with physical activity [20]. In the re-

Table 3. Comparing the Mean Scores of Transtheoretical Model Constructs by Employment Status of Women Using t-Test

Construct	Employed	Housewife	P	T
Self-efficacy	19.25 ± 4.2	18.56 ± 4.43	0.3	-1.02
Pros	9.03 ± 4.2	9.59 ± 25.4	0.4	0.8
Processes of change	30.21 ± 8.5	29.5 ± 12.11	0.6	0.4
Co ns(barriers)	16.98 ± 4.4	14.66 ± 4.6	0.001	3.2

sent study, there was an inverse relationship between BMI and the constructs of the TTM (self-efficacy, processes of change, perceived benefits); but, there was no relationship between BMI and the perceived barriers, and Roozbahani's study showed an inverse relationship between BMI and self-efficacy (20), conforming the findings in the present study; however, Roozbahani's study showed that the perceived benefits had a direct effect on physical activity, not conforming the findings in the present study, and the reason might be the difference in participants, since the subjects in that study were diabetic persons who perceived the benefits of physical activity.

It is necessary to have a systematic planning based on conscious selection to maintain and/or increase such behaviors as physical activity, since they play a key role in people's health. In other words, it is necessary to create a system on the basis of conscious selection since useful behaviors such as physical activity and exercise are not automatic or habitual behaviors (21).

To promote the physical activity behavior, it is necessary to identify many factors influencing physical activity, including different composite models of qualitative studies, and use planning to cope with barriers of physical activity. In addition, self-efficacy enhancing techniques for the promotion of women's physical activity are suggested to decrease the rate of immobility among females. As self-efficacy is highly correlated with BMI, tailoring intervention to enhance this key construct might lead to better behavioral changes.

One of the limitations of the present study was that it identified few barriers that discourage physical activity. Therefore, it is necessary to conduct further qualitative studies for the identifications of more barriers to physical activity.

The results of the study provided a framework for future educational interventions, aiming at increasing physical activity in females.

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Footnotes

References

1. Kroll C, Keller R, Scholz U, Perren S. Evaluating the decisional balance construct of the Transtheoretical Model: are two dimensions of pros and cons really enough?. *Int J Public Health.* 2011;**56**(1):97–105. doi: 10.1007/s00038-010-0175-y. [PubMed: 20697769].

2. Clarke PE, Gross H. Women's behaviour, beliefs and information sources about physical exercise in pregnancy. *Midwifery.* 2004;**20**(2):133–41. doi: 10.1016/j.midw.2003.11.003. [PubMed: 15177856].

3. Plotnikoff RC, Hotz SB, Birkett NJ, Courneya KS. Exercise and the transtheoretical model: a longitudinal test of a population sample. *Prev Med.* 2001;**33**(5):441–52. doi: 10.1006/pmed.2001.0914. [PubMed: 11676586].

4. Kang SJ. Trekking exercise promotes cardiovascular health and fitness benefits in older obese women. *J Exercise Rehabilitation.* 2014;**10**(4):225. doi: 10.12965/jer.140136.

5. Thompson PD, Buchner D, Pina IL, Balady GJ, Williams MA, Marcus BH, et al. Exercise and physical activity in the prevention and treatment of atherosclerotic cardiovascular disease: a statement from the Council on Clinical Cardiology (Subcommittee on Exercise, Rehabilitation, and Prevention) and the Council on Nutrition, Physical Activity, and Metabolism (Subcommittee on Physical Activity). *Circulation.* 2003;**107**(24):3109–16. doi: 10.1161/01.CIR.0000075572.40158.77. [PubMed: 12821592].

6. Soleymanian A, Niknami S, Hajizadeh E, Shojaeizadeh D, Montazeri A. Development and validation of a health belief model based instrument for measuring factors influencing exercise behaviors to prevent osteoporosis in pre-menopausal women (HOPE). *BMC Musculoskelet Disord.* 2014;**15**:61. doi: 10.1186/1471-2474-15-61. [PubMed: 24581300].

7. Esteghamati A, Khalilzadeh O, Rashidi A, Kamgar M, Meysamie A, Abbasi M. Physical activity in Iran: results of the third national surveillance of risk factors of non-communicable diseases (SuRFNCD-2007). *J Phys Act Health.* 2011;**8**(1):27–35. [PubMed: 21297182].

8. Adachi-Mejia AM, Drake KM, MacKenzie TA, Titus-Ernstoff L, Longacre MR, Hendricks KM, et al. Perceived intrinsic barriers to physical activity among rural mothers. *J Womens Health (Larchmt).* 2010;**19**(12):2197–202. doi: 10.1089/jwh.2009.1879. [PubMed: 20973674].

9. Kirk A, MacMillan F, Webster N. Application of the transtheoretical model to physical activity in older adults with type 2 diabetes and/or cardiovascular disease. *Psychol Sport Exercise.* 2010;**11**(4):320–4.

10. Korologou S, Barkoukis V, Lazuras L, Tsorbatzoudis H. Application of the Transtheoretical Model to Physical Activity in Deaf Individuals. *Adapt Phys Activ Q.* 2015;**32**(3):223–40. doi: 10.1123/APAQ.2013-0073. [PubMed: 26113551].

11. Fahrenwald NL, Walker SN. Application of the Transtheoretical Model of behavior change to the physical activity behavior of WIC mothers. *Public Health Nursing.* 2003;**20**(4):307–17.

12. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *J Consulting Clin Psychol.* 1983;**51**(3):390–5.

13. Klompstra L, Jaarsma T, Stromberg A. Physical activity in patients with heart failure: barriers and motivations with special focus on sex differences. *Patient Prefer Adherence.* 2015;**9**:1603–10. doi: 10.2147/PPA.S90942. [PubMed: 26635469].

14. Sjogren K, Hansson EE, Stjernberg L. Parenthood and factors that influence outdoor recreational physical activity from a gender perspective. *BMC Public Health.* 2011;**11**:93. doi: 10.1186/1471-2458-11-93. [PubMed: 21310038].

15. Jones C, Jancey J, Howat P, Dhaliwal S, Burns S, McManus A, et al. Utility of stages of change construct in the planning of physical activity interventions among playgroup mothers. *BMC Res Notes.* 2013;**6**:300. doi: 10.1186/1756-0500-6-300. [PubMed: 23895288].

16. Thornorarinsson ET, Haretharson T, Sigvaldason H, Sigfusson N. [The relationship between educational level, physical activity and mortality.]. *Laeknabladid.* 2002;**88**(6):497–502. [PubMed: 16940634].

17. Shaw BA, Spokane LS. Examining the association between education level and physical activity changes during early old age. *J Aging Health.* 2008;**20**(7):767–87. doi: 10.1177/0898264308321081. [PubMed: 18559963].

18. Finger JD, Tylleskar T, Lampert T, Mensink GB. Physical activity patterns and socioeconomic position: the German National Health Interview and Examination Survey 1998 (GNHIES98). *BMC Public Health.* 2012;**12**:1079. doi: 10.1186/1471-2458-12-1079. [PubMed: 23241280].

19. Hernandez B, de Haene J, Barquera S, Monterrubio E, Rivera J, Shamah T, et al. [Factors associated with physical activity among Mexican women of childbearing age]. *Rev Panam Salud Publica.* 2003;**14**(4):235–45. [PubMed: 14662074].

20. Roozbahani N, Ghofranipour F, Ardabili HE, Hajizadeh E. Factors influencing physical activity among postpartum Iranian women. *Health Education J.* 2014;**73**(4):466–76.

21. Wallace LS. Osteoporosis prevention in college women: application of the expanded health belief model. *Am J Health Behav.* 2002;**26**(3):163–72. [PubMed: 12018752].