

Physical activity among employee women based on transtheoretical model

Firoozeh Mostafavi, Asiyeh Pirzadeh

Department of Health Education and Promotion, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Introduction: Today, many jobs are associated with the inactivity or sedentary lifestyle. Employees' health will be affected by their depriving of the benefits of physical activity (PA). Therefore, the present study was undertaken to determine the PA among employee women in Isfahan University of Medical Sciences based on the transtheoretical model.

Materials and Methods: This is a cross-sectional study has been performed in Isfahan University of Medical Sciences employee women (2013). A convenience sample of 100 women was selected. Data were collected by validated and reliable questionnaire in three parts (demographics information, PA scale, and TTM constructs). Data were analyzed by SPSS SPSS (version 16.0; SPSS, IBM, Inc, Chicago, IL, USA) and descriptive and analytical statistics such as ANOVA and independent *t*-test were used. A two-tailed $P < 0.05$ was considered statistically significant. **Results:** The mean of PA was 21.17 ± 27.30 min in a day. Weekly heavy, moderate, and light exercise mean was 0.72 ± 1.81 , 0.89 ± 1.87 and 0.57 ± 1.57 days, respectively. In this study, 26% of women were in contemplation, 22% in contemplation, 20% in preparation, 13% in action, and 19% in the maintenance stage. Furthermore, there were significant differences between consciousness raising, dramatic relief, counter-conditioning, stimulus control, helping relationships, reinforcement management, and self-liberation with stages of change constructs. **Conclusion:** Because of a significant relationship between cognitive and behavioral processes and PA in this group, designing and implementing an educational program based on the transtheoretical model may be useful in promoting PA of a female employee.

Key words: Behavior and behavior mechanisms, employment, exercise, model

INTRODUCTION

Exercise is recognized as an important health-related behavior conducive to good mental and physical health and well-being.^[1-3] Regular physical activity (PA) has many health benefits, including reduced risk of cardiovascular disease,^[4] ischemic stroke,^[5] noninsulin-dependent diabetes

(type 2),^[6-9] colon cancers,^[10,11] osteoporosis,^[12,13] and depression.^[14]

Despite these benefits, a large proportion of the population in many countries fails to participate in sufficient PA to achieve these outcomes.^[15-17] PA among US adults is lower than of recommended level for health promotion^[18-20] and this issue determines as a target of public health intervention.^[21]

Review of studies have shown that PA is low in Iran (68.7–70.8%).^[22]

Address for correspondence: Dr. Asiyeh Pirzadeh, Department of Health Education and Promotion, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: as_pirzadeh@hlth.mui.ac.ir

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Today, many jobs have been created with advances in technology; unfortunately, these jobs are associated with the inactivity or sedentary lifestyle. Employees' health will be affected by their depriving of the benefits of PA.^[23]

In Finland, more than one-third of the working population engages in PA less than recommended for health.^[24] One study in female Japanese showed a high percentage of Japanese women are not regularly active.^[25]

In Iran, a study conducted by Robabi *et al.* in bank employees (Iranshahr) have shown that a high percentage of employees did not have enough PA.^[26] Also in Jalilian *et al.* study, on employees women in Hamadan University of Medical Sciences, indicated that 65% of women employees did not have sufficient PA.^[27]

Based on our knowledge, there are no any available data regarding the PA levels and its relevant affecting factors in Isfahan University of Medical Sciences employees.

Nowadays, health educators use health education models to explore health promotion behaviors and behavior change. The transtheoretical model is one of the exploratory models. The transtheoretical model (also called the stages of change model), developed by Prochaska and DiClemente in the late 1970s.^[28] The TTM model has four constructs; stages of change, self-efficacy, decisional balance, and processes of change.

The TTM consists of five stages of exercise behavior change: (1) Precontemplation, (2) contemplation, (3) preparation, (4) action, and (5) maintenance.^[29]

Processes of change are divided into two categories of cognitive and behavioral processes. Cognitive processes are consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation, and self-liberation and behavioral processes are social liberation, counter-conditioning, stimulus control, reinforcement management, and helping relationships.^[30]

Another construct of the model is decisional balance that focuses on the importance of perceived positive (pros) and negative (cons) outcomes of a behavior change.^[31]

Self-efficacy is one's perceived confidence in the ability to carry out a specific behavior successfully;^[32] and thus have different levels of confidence in their ability to maintain exercise benefits and to overcome exercise barriers.^[33]

The mentioned model has been applied.

In Nishida *et al.* study in Japanese female employees and showed that 90% of subjects were in inactive stages (precontemplation to preparation).^[34]

In Iran also, Jalilian *et al.* study showed 45.7% of employees women placed in precontemplation, contemplation and

preparation stage and a significant relationship was found between the benefits, barriers, self-efficacy and stages of change.

Mazloomi Mahmoudabad *et al.* study also stated that more than 70% of the people in Yazd were investigated in preaction stages.^[35]

The aim of this study was to determine the PA among employee women in Isfahan University of Medical Sciences based on the transtheoretical model.

MATERIALS AND METHODS

This cross-sectional study was conducted in 100 female employees of Isfahan University of Medical Sciences in 2013.

The participants were a convenience sample of employees. All participants were informed about the details of the study and were asked to read and sign a consent form.

The following are criteria for inclusion of women to the study: Ruled employment as employees for more than 6 months, the desire to participate in the study, and not being pregnant.

Data collected by self-administered questionnaire. The demographic information (age, weight, height, number of child, level of education) were obtained. For measuring exercising behaviors, weekly PA was used.^[36]

In order to measure exercise behavior, the stage of exercise behavior change questionnaire developed by Marcus and Forsyth used in this study.^[37] Stage of exercise behavior change was assessed using 5-item.

Another structure in this model is processes of change. This structure was measured by the process of change questionnaire developed by Nigg *et al.*^[38] This questionnaire contains 30 items that measure the 10 process of change (cognitive and behavioral process). In this questionnaire, participants were asked to determine the frequency of occurrence of each item on a five-point Likert scale (ranging from 1, "never" to 5, "repeatedly").

The decision balance scale for exercise, developed by Plotnikoff *et al.*^[39] with 10 items based on Lickert scale was used to assess pros and cons participants were asked to determine, on a five-point Likert scale (ranging from 1, "not at all important" to 5, "extremely important").

The perceived self-efficacy scale consisted of 6 items with four point scale ranging from 1 (cannot do) to 4 (certainly can do).^[40]

All the questionnaires were translated using forward translation, back-translation in Farmanbar *et al.* study and reliability and validity has been confirmed.^[41]

Finally, content validity of questionnaires was assessed by an expert panel (five expert in health education and PA). It showed good acceptance and was adopted in this study. Expert panel was used for content validity too. The reliability was determined by Cronbach's alpha, and the scores of alpha for the process of change, self-efficacy, and decisional balance were 0.94, 0.81, and 0.78 continuously. Approximate time to answer questions was 30 min.

Statistical analyses were performed using SPSS software (version 16, IBM Inc., Chicago, IL, USA). We used descriptive (mean and frequency) and analytical statistics (independent *t*-test and one-way ANOVA test). ANOVA test was used to compare the mean of processes of change construct and self-efficacy with stages structure. A two-tailed *P* < 0.05 was considered statistically significant.

RESULTS

The study was conducted on 100 female employees. The results showed that the average age was 37.61 ± 7.99 , and there was no any significant relationship between age and level of PA. The relationship between PA and other demographic information can be found in Table 1.

Distribution of people in stages of change was as follows: 26% precontemplation, 22% contemplation, 20% preparation, 13% action, and 19% maintenance. There were significant differences between consciousness raising, dramatic relief, counter-conditioning, stimulus control, helping relationships, reinforcement management, and self-liberation with stages of change constructs [Table 2].

Furthermore, ANOVA test showed there was no significant difference between environmental reevaluation, self-reevaluation, and helping relationship with stages of change constructs [Table 2].

Figure 1 shows significant improvements in self-efficacy from precontemplation to maintenance.

The mean of pros are, respectively, as follows: Precontemplation 58.15 ± 22.29 , contemplation 70.73 ± 22.81 , preparation 73.00 ± 19.59 , action 75.69 ± 16.93 , maintenance 86.10 ± 18.40 . The statistical test showed there were significant differences between pros and stages of change ($F = 5.304, P = 0.001$).

In relation to cons, ANOVA do not show differences between cons and stages of change. While, the mean of cons was in precontemplation 82.00 ± 11.66 , contemplation 77.82 ± 13.11 , preparation 76.00 ± 15.41 , action 70.15 ± 14.11 , maintenance 75.58 ± 17.17 ($F = 1.645, P = 0.169$).

DISCUSSION

This study was conducted with the aim of determining the PA among women employees in Isfahan University of Medical Sciences based on the transtheoretical model.

In this study, 26% of women were in contemplation, 22% in contemplation, 20% in preparation, 13% in action, and 19% in maintenance. Indeed, 68% of subjects were inactive, and 32% were active. It consist with Jalilian *et al.* study that 65% of women did not have enough PA.^[27]

In Iran, Mazloomi Mahmoudabad *et al.* showed that 26.4% of subjects were active. It consist with this study, and this matter could be due to cultural similarities between people in two city (Isfahan and Yazd).^[35]

There were significant differences between consciousness raising, dramatic relief, counter-conditioning, stimulus control, helping relationships, reinforcement management, and self-liberation with stages of change construct, also with progressing to maintenance, the mean of constructs is increasing. These results are in consist with Lee *et al.* study.^[42] But in the Nigg *et al.* study, all structures of the model were significantly different in stages of change.^[43]

In Kirk *et al.* study, helping relationships, self-liberation, and consciousness raising increased from precontemplation to maintenance.^[44]

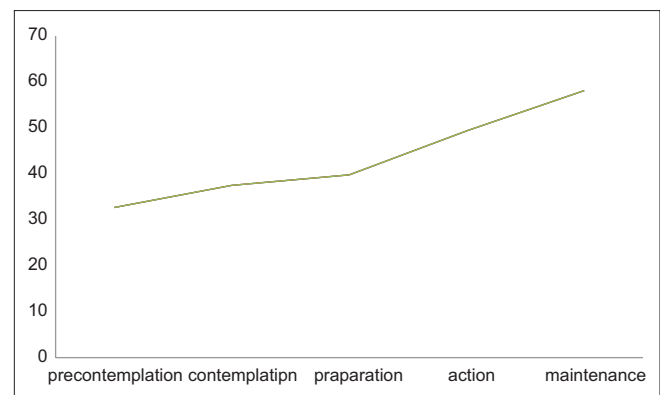


Figure 1: The mean of self-efficacy in stages of change

Table 1: The relationship between physical activity and demographic information

| Demographic factors | Mean ± SD | P |
|----------------------------|---------------|--------|
| Age | 37.61 ± 7.99 | 0.0641 |
| Weight (kg) | 70.57 ± 11.80 | 0.051 |
| Height (m) | 1.63 ± 7.63 | 0.063 |
| Education level (%) | | |
| Diploma | 39 | 0.032 |
| Bachelor of science | 51 | |
| Master of science and more | 10 | |
| Number of child (%) | | |
| 0 | 28 | 0.468 |
| 1 | 20 | |
| 2 | 37 | |
| 3 | 13 | |
| 4 | 2 | |

SD=Standard deviation

Table 2: The relation between stages of change and processes of change

| Processes of change variable | Precontemplation | Contemplation | Preparation | Action | Maintenance | P |
|------------------------------|------------------|---------------|---------------|---------------|---------------|-------|
| Consciousness raising | 37.18 (19.79) | 41.21 (18.31) | 50.00 (13.96) | 47.69 (13.30) | 62.11 (24.04) | 0.000 |
| Dramatic relief | 75.90 (51.17) | 69.70 (22.32) | 64.00 (18.40) | 67.70 (23.23) | 86.67 (19.88) | 0.012 |
| Environmental reevaluation | 72.82 (23.78) | 72.73 (26.74) | 76.00 (21.46) | 70.77 (20.46) | 85.96 (23.71) | 0.307 |
| Self-reevaluation | 72.56 (20.68) | 79.0 (27.16) | 80.66 (24.17) | 82.56 (17.32) | 90.88 (18.49) | 0.115 |
| Helping relationship | 63.07 (18.78) | 65.45 (20.22) | 60.33 (19.76) | 60.00 (19.43) | 54.73 (17.99) | 0.474 |
| Counter-conditioning | 32.56 (12.83) | 39.09 (15.97) | 40.33 (11.54) | 52.30 (25.21) | 65.26 (18.53) | 0.000 |
| Stimulus control | 34.61 (13.47) | 47.57 (24.37) | 50.33 (15.96) | 41.54 (20.02) | 52.63 (24.73) | 0.022 |
| Helping Relationships | 53.33 (21.24) | 70.00 (23.61) | 70.00 (21.24) | 73.84 (18.35) | 85.97 (18.84) | 0.000 |
| Reinforcement management | 39.49 (15.07) | 59.70 (22.20) | 56.00 (18.27) | 66.67 (20.18) | 82.80 (17.54) | 0.000 |
| Self-liberation | 35.12 (20.79) | 47.87 (22.21) | 42.33 (23.42) | 56.41 (26.47) | 78.94 (25.94) | 0.000 |
| Pros | 58.15 (22.29) | 70.73 (22.81) | 73.00 (19.59) | 75.69 (16.93) | 86.10 (18.40) | 0.001 |
| Cons | 82.00 (11.66) | 77.82 (13.11) | 76.00 (15.41) | 70.15 (14.11) | 75.58 (17.17) | 0.169 |
| Self-efficacy | 32.69 (9.70) | 37.50 (10.37) | 39.79 (13.68) | 49.36 (11.26) | 58.11 (19.12) | 0.000 |

It seems that special attention needed to environmental reevaluation, self-reevaluation, and helping relationship for women.

Based on the findings, the mean of self-efficacy is increasing from precontemplation to maintenance and the mean of action and maintenance stage is more than other stages.

In Marcus *et al.* study, finding show that people who were physical active had higher self-efficacy than inactive people.^[45]

Other studies such as Nishida *et al.* and Gorely and Bruce stated that those who have high self-efficacy for PA, they are more physically active.^[34,46] Purath and Miller also showed women have more self-efficacy with an increase in the stages of change.^[47]

Results indicated that in the movement from precontemplation to maintenance pros are increasing, and cons are decreasing. It is consist with Purath and Miller and Kim study.^[47,48] Groly also emphasized the role of cons as an influencing factors on the PA.^[36]

Limitation

This study has been done among the women, so there was no chance for inter gender comparison of PA in staff and also this limitation led to the small sample size. Long questionnaire and impossibility of assessing PA in different jobs were other limitations of this study.

CONCLUSION

Because of a significant relationship between cognitive and behavioral processes and PA in this group, designing and implementing an educational program based on the transtheoretical model may be useful in promoting PA of a female employee.

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Conflicts of interest

There are no conflicts of interest.

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